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THE DOCTOR SPEAKS - CALCIUM NEEDS, BONE HEALTH AND OSTEOPOROSIS – PARTS 1 & 2

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Q. I am 55 years old, and I broke some of the bones in my foot over 3 months ago. A recent x-ray shows that the bones are not healing very quickly. Can you help me understand why this is?

A. Your question leads us into the larger question of how we can maintain healthy bones and avoid the osteoporosis and bone fractures which are increasingly likely as we age.

I believe that the factors which have retarded the healing of your foot fractures are very likely the same factors which, research has found, increase the occurrence of osteoporosis and fractures in the average person.

A lot of misleading advertising today reminds us, especially women, to be sure to take enough calcium to avoid osteoporosis. Therefore most Americans mistakenly believe that the reason our bones get thinner (osteoporosis) and we become more prone to fractures as we get older, is because we're not getting enough calcium in our diet. This popular misconception is good for the dairy and supplement industries but it doesn't help the rest of us very much. Here's why:

Bones are not the solid inert chunks of calcium that we imagine. Bones are living dynamic organs of our body that are continually being remodeled; that is, they are continually dissolved and rebuilt by specialized bone-dissolving and bone-building cells within us. All of our bones completely renew themselves every seven to ten years. Bone loss that can lead to osteoporosis happens when, for a variety of known and unknown reasons, the activity of the bone-dissolving cells predominates over that of the bone-budding cells.

Our bones consist of a living matrix or network of protein fibers which create the framework upon which mineral crystals of calcium phosphate salts are laid down. The protein fibers are alive and gristly and make the bone flexible while the mineral calcium salts are dead and make the bone hard, dense and heavy.

Bone density measurements, which essentially measure bone calcium, confirm that after about the age of 50 it is normal for a person to lose bone density over time. Loss of bone density that is slightly greater than normal for ones age is called osteopenia. Moderately greater than normal loss of bone density is called osteoporosis.

Research done in Holland in 1997 showed that from age 60 to 80 the risk of hip fracture increased thirteen-fold among men as well as women. 1 The surprising finding was that loss of bone density (bone calcium) accounted for only a doubling of the risk, while "other factors" accounted for the rest of this thirteen-fold increased risk of hip fracture in these Rotterdam citizens. These other factors had nothing to do with loss of calcium or bone density but rather with the loss of flexibility and elasticity of the bones which normally occurs as we age.

What makes our bones elastic and flexible? The living part of our bones, the protein fiber matrix. As we age, this tight and dense framework or matrix of protein fibers becomes thinner and looser because the individual fibers lose their elasticity and become drier and stiffer (the same is true for all the tissues of our body). This makes our bones more brittle and prone to fractures, and slower to heal when they do fracture.

Therefore, to avoid fractures and to have vigorous, quick-healing bones we must learn how to maintain our life forces, for these are the forces which maintain the tightness and the resilience of the living protein fibers which are deposited within that protein fiber framework. Osteoporosis is not just the loss of bone mineral mass (calcium crystals) but also the fraying of the intimate fabric of living protein fibers which forms the very basis of our bones. One can demonstrate this non-calcium protein fabric of bone by immersing a chicken bone in a bottle of white vinegar for several days until all the calcium is dissolved away. What remains still has the same shape and form of the bone but it is entirely elastic, as if made of rubber! Rubber is, after all, also derived from a living substance. It is made by the rubber tree.

So we see that our miraculous human organism combines living and pliant protein fibers with hard crystalline calcium from the non-living mineral world to create our sturdy and resilient bones, and then our organism continually remodels them and heals them when they are injured. These life forces of growth, remodeling and healing in us which Rudolf Steiner called etheric forces or simply the etheric (called chi or prana in eastern wisdom) are responsible for the vigor and resilience of our bones and of all our other organs and tissues as well.

After mid-life our vital etheric forces gradually decline. This is the fundamental reason why our bones lose both elasticity and density then. What makes us vulnerable to fractures is primarily the loss of the living elasticity of the protein fiber bone matrix. The loss of non-living calcium density from our bones is only a secondary cause. Both losses are caused by the gradual withdrawal of our etheric life forces from our bones with aging. However, it is only when the life forces withdraw at a faster than average rate for our age that osteoporosis and an abnormally high risk of fractures comes about. Modern medicine has no name for, and no way of measuring, the loss of elasticity of the protein fiber framework of our bones. Nevertheless, the integrity and flexibility of this living framework are the most important factors protecting us from fractures.

Modern medical research however has identified a number of lifestyle, nutritional and hormonal factors which have been repeatedly observed to accelerate the bone

deterioration we call osteoporosis. These factors are quite diverse, ranging from physical immobility to lack of sunlight to poor diet to caffeine intake to hormonal imbalance to excessive protein intake to tobacco use to alcohol overindulgence to overly vigorous exercise!

What we can say with certainty from the perspective of anthroposophic medicine is that all of these known factors which accelerate osteoporosis are factors which diminish or deplete the vital work of our body's etheric life forces.

We will discuss these factors in detail in *The Doctor Speaks* in the next issue, but for now in order to promote bone healing, I recommend the following; Eat fresh whole foods with lots of leafy greens and root vegetables like carrots, beets and turnips, in addition to your normal diet.

- Do aerobic exercise at least four times weekly to promote better circulation to your feet and bones.
- Try to avoid all caffeine, soft drinks, alcohol and tobacco.
- Take 1/2 tsp. of a tested, certified pure cod liver oil every morning, to provide vitamin D.
- Take calcium citrate providing 600mg to 1200 mg per day of elemental calcium.
- Take a multivitamin/mineral pill daily
- Take a total of 400 to 800 mg daily of magnesium and 3 to 5mg daily of boron (as sodium tetraborate).

Part II

In my last column on bone health I emphasized a broader view: that the elasticity and flexibility of the living protein fiber framework of a bone is much more important than its calcium content in protecting our bones from fractures. DEXA bone mineral density scans are commonly prescribed by doctors to assess one's risk of fractures and to diagnose a mild (osteopenia) or moderate (osteoporosis) low-calcium status of one's bones. However, in an excellent article on bone health in the winter 2003 issue of LILIPOH, Clinton Greenstone, M.D. stated, "Actually, these [bone density] tests alone don't predict fracture rates or show true bone strength in the overwhelming majority of patients." Dr. Greenstone further explained that bisphosphonate drugs like Fosamax cause slight increases in bone density and a slight lowering of the fracture rate only for about two years and that "after five or six years the fracture rates increase because the bone formed while on these medications is actually weaker."

In the narrow focus on calcium that dominates most media stories on bone health today, we are seldom told that the first step in building strong, resilient bone is the laying down

of a dense, elastic and well-structured living protein fiber framework, or bone matrix. The second step is the attachment of calcium phosphate mineral crystals to the protein fiber framework, i.e. the protein fibers become calcified. A tightly woven protein fiber matrix will attract more calcium to a developing bone and result in a stronger and denser bone than the bone formed from a loosely woven protein fiber matrix. This explains why osteoporosis never results from calcium deficiency alone but rather from those factors which hinder the formation of a tightly woven protein fiber matrix as our bones continually remodel themselves throughout our lives. In the last LILIPOH I said that the wise forces of life, growth and remodeling in us are responsible for the strength and resilience of our bones, skin, connective tissue and all the organs and tissues of our body. These wise forces of life, or etheric forces, are our inner highly skilled construction crew which builds the protein fiber matrix of our bones and everything else in our body. Yet, these forces need the direction of our "inner architect" to maintain our bones and our body in good health throughout life. Just as an architect knows the materials needed for a building as well as the plans, our inner architect knows exactly how much and what kind of foods are needed to maintain strong bones and tissues. This inner architect is our inner instinctive sense that humans and animals are born with, a "life sense: that guides our food choices as our needs change throughout life. Animals in the wild have a keen instinctual life sense which unerringly guides them to eat what they need to maintain health lifelong. We humans lose this function of our life sense after early childhood, so that, except during pregnancy or illness or other special circumstances, we are left with only our habitual likes and dislikes to guide our food choices.

Osteoporosis and many other chronic conditions prevalent in developed nations owe their existence to the sad fact that for most of us, our likes and dislikes in food and lifestyle have little or nothing to do with what our bodies need to maintain good health. This keeps doctors busy. The good news however, is that we can educate our life sense to begin wanting the foods that we actually need, if we're willing to make the effort.

I find that many of my patients don't eat enough vegetables, fruits or whole grains. Modern research confirms that vegetables, leafy greens, and whole grains like oats, rye and brown rice, are rich in the forces and nutrients needed by our inner construction crew, our etheric life forces, to build a strong protein fiber bone matrix and to calcify it into a sturdy yet flexible bone.

Perhaps surprisingly, countries with the highest dairy intake have the highest hip fractures rates. In the Nurse's Health Study in 1980 of 761 women aged 34 through 59-years-old who had never used calcium supplements, the women who drank two or more glasses of milk per day had a 45 percent increased risk of hip fracture compared to women consuming one glass or less per week.

Many of the causes of osteoporosis mentioned in my last column, such as tobacco use and excessive intake of protein, (including dairy), caffeine, alcohol, sugar, processed foods and soft drinks have in common an acid-forming effect in the body. An acidic inner environment is also created by stress, nervousness, exhaustion, excessive exercise and by an overactive thyroid gland. All of these factors increase the tendency to osteoporosis by

depleting our vital etheric forces. When our life forces are strong and our stress is low, our inner environment becomes alkaline and we slow down and relax and become more cow-like in our behavior. When the hectic pace of life depletes our etheric forces, then our inner condition is acid and, if we have not yet reached the stage of exhaustion, we are tense, nervous, irritable, and generally bird-like in our behavior. Many of our modern illnesses, including osteoporosis, stem from dietary and lifestyle influences that speed us up, make us inwardly acid and brittle and deplete our etheric vitality.

In the natural world, cows are the epitome of strong etheric life forces; that why they are considered holy in India. Birds are the epitome of strong nerve forces, (which deplete life forces), and which give birds their typical nervous, hyperactive behavior. With their low life forces, birds easily die after shock or injury, not so with cows. The modern epidemic of osteoporosis is linked to our prevailing high-stress, accelerated, bird-like lifestyle. So the bottom line is: to have strong bones, be bovine, not aquiline!

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1. Chris E D H De Lact, Ben A van Hour, Huibert Burger, Albert Hofman, Huibert A P Pols *Bone Density and Risk of Hip Fracture In Men and Women: Cross Sectional Analysis ...* BMJ 1997; 315:221-5