Osteoporosis

Osteoporosis is a disease of the bones. This disease occurs when someone loses too much bone, makes too little bone, or both. This leads to weakened bones and the possibility of a break from a minor fall or simple action, such as sneezing or bumping into a stationary object. The honeycomb-like feature of the bone, in those that have Osteoporosis, will have much bigger spaces and holes than found in healthy bone. The formation of gaps in the bone is caused by osteoclast activity. Osteoclasts are a specific type of bone cell that are responsible for the breakdown and resorption of damaged bone tissue. When functioning properly they are an integral part of maintaining bone health. Patients suffering from Osteoporosis have an imbalance between bone resorption and bone formation, caused by a disruption in the normal function of osteoclasts.

According to the National Osteoporosis Foundation, one in two women and up to one in four men, age 50 and older, will break a bone due to Osteoporosis. Osteoporosis doesn’t just break bones, such as the hip, spine and wrist, it can cause individuals to lose height and even cause one to become stooped or hunched. Sometimes, Osteoporosis is referred to as the “silent disease” because you cannot feel your bones weakening. Breaking a bone is usually the first sign that an individual has Osteoporosis.

Making a Diagnosis

Osteoporosis is responsible for two million broken bones and $19 billion in related medical costs every year.

Are You At Risk?

There are numerous factors, both controllable and uncontrollable, that put you at risk for developing the disease.

Below you will find a list of both controllable and uncontrollable factors:

**Controllable Factors**
- Not getting enough calcium and/or vitamin D
- Smoking
- Drinking alcohol
- Bad nutrition (not eating enough fruits and vegetables, or too much protein, caffeine and sodium)
- Losing too much weight
- Being inactive

**Uncontrollable Factors**
- Being over age 50
- Family history
- Broken bones or height loss
- Menopause
- Being female
- Lost body weight (being too thin)

There are five different steps a physician will take to diagnose whether or not an individual has Osteoporosis. First, the physician will review your medical history and then perform a physical exam. A bone density test, which is the only test that can diagnose Osteoporosis before a bone has been broken, will be given. This test will ultimately estimate the density of your bones and your chance of breaking a bone. The physician will then measure your FRAX score. The WHO (World Health Organization) Fracture Risk Assessment Tool will measure your chances of breaking a hip over the next ten years. This test can help with treatment decisions in select individuals. Lastly the physician will test your blood, urine, calcium levels, thyroid function and hormone levels to try and identify if you have another medical condition that may be causing bone loss. If there is another condition that is causing your bone loss, you will be treated accordingly. For many individuals, the cause of their bone loss is unknown.
Before a treatment can be selected, there are many factors that will go into the decision, such as your sex, age, personal preferences and how severe your Osteoporosis is. There are two categories of Osteoporosis medication that can/will be prescribed to those diagnosed with the disease; antiresorptive medications slow bone loss and anabolic drugs increase the rate of bone formation. According to the National Osteoporosis Foundation, the length of treatment should be determined on an individual case, based on the individual’s medical/fracture history and test results.

The first area of focus should be ensuring that you are reaching your daily recommendations of calcium and vitamin D. Adults under the age of 50 years old need 1000mg of calcium and 400 – 800 IU (international units) of vitamin D daily. Adults over 50 years old need 1200mg of calcium and 800 – 1000 IU of vitamin D. If you are not reaching your daily requirements from diet alone, there are a wide variety of calcium/vitamin D supplements available. Along with diet changes, patients should consult with their physician and begin supervised, low-impact weight bearing exercise to help strengthen bones and muscles.

Once the physician deems them necessary, antiresorptive medications (bisphosphonates), are usually the first line of therapy. These medications include: Fosamax (alendronate), Actonel (risendronate), and Boniva (ibandronate). Bisphosphonates work by inhibiting osteoclast activity and therefore reduce bone resorption/breakdown. Reclast (zoledronic acid) is considered a third generation bisphosphonate; unlike the previous oral medications this is an injectable medication that requires only once yearly dosing. Reclast not only inhibits osteoclast activity, it causes osteoclast apoptosis (death).

Forteo (teriparatide) is a recombinant parathyroid hormone. It not only reduces bone degradation, but helps stimulate formation of new bone and increases bone mass. Forteo reduces the incidence of fragility fractures, but is reserved for high risk patients due to its side effect profile.

Prolia (denosumab) is a human monoclonal antibody that blocks (RANKL) receptors that activate osteoclasts. Blocking these receptors result in decreased bone resorption. Prolia is FDA approved for treatment of prophylaxis in postmenopausal women with osteoporosis that have a high risk of fracture.