Osteopenia/Osteoporosis

Osteopenia is defined as a bone density that is somewhat low. The World Health Organization formed a committee in 1994 to define bone mineral density disorders. That committee created four diagnostic categories: Normal, Osteopenia, Osteoporosis, and Established Osteoporosis.

These diagnostic categories depend on the bone density, and the presence of fractures. The committee set cut-off values that were relative to young healthy individuals. The definitions involve "standard deviations" which are statistical units of variation. **Osteopenia** is a bone density between one standard deviation and 2.5 standard deviations below average for young people. **Osteoporosis** is a bone density lower than 2.5 standard deviations below young people. **Established osteoporosis** is a bone density lower than 2.5 standard deviations in the presence of fragility fractures.

Bone density naturally declines with age in both men and women. The percentage of women who have osteopenia depends on age and race and use of hormones. By definition, 16% of white women aged 20-29 have osteopenia, and less than 1% have osteoporosis. Currently about 38% of women aged 65 have osteopenia and 20% have osteoporosis. By age 80 only 15% of women still have normal bone density, and those with osteopenia are above average for their age.

The relationship between osteopenia and fractures depends heavily on age. In general, the risk of a fracture will double with every decade past 50, even with the same bone density. A woman aged 55 with osteopenia has about a 2% chance/year of having a fracture, and a woman aged 75 with osteopenia has about an 8% chance/year (which is approximately average for a 75 year-old woman).

The lifetime risk of a hip fracture depends on age and bone density. A young person with osteopenia doesn't have much risk in the next 5 years, but if no prevention is done, the lifetime risk will be about 20 or 30%. An elderly woman with osteopenia has a lifetime risk of about 10%.

**Osteopenia and Osteoporosis in Men.** This is a topic not often discussed, but nonetheless an issue to learn about and understand. In men over age 50 about 5 percent of all men have osteoporosis (7% in caucasians, 5% in blacks, and 3% in hispanics), and about 30-45% have osteopenia. Because men have a greater bone mass than women they generally develop osteoporosis at a later age than women - typically about age 75 when their incidence of hip fracture starts to
increase. Men also have a much higher complication rate and death rate with fractures than women do - prevention is the key!!

**Risk Factors for Osteopenia and Osteoporosis.** 1) Long term glucocorticoids (prednisone, etc.) for asthma, inflammatory conditions like rheumatoid, lupus, etc. are a major problem! Anyone on more than 5mg daily should be on medication for prevention! 2) Seizure medications can lead to bone loss due to effects on bone metabolism and Calcium and Vitamin D supplements are indicated. 3) Low levels of androgens in men and low levels of estrogens in women can lead to bone density problems and hormone replacement for these specific conditions are indicated with an understanding of the risks and benefits that this entails. 4) Hyperparathyroidism - this really affects bone density and needs evaluation and treatment to preserve bone density! 5) Abnormal thyroid function, both under and over function can adversely affect bone density. 6) Alcohol and Tobacco use - the more you smoke or the more you drink, the more likely you are to have with your bone density! 7) Low body weight - one of the few times a low weight is bad for you - gravity pulling on your bones maintains your bone density - the less you weigh, the less gravity pulls on your bones! 8) Lack of regular exercise - similar reason as in #7 - the gravity pulling down on your bones as you exercise preserves bone density - the best is jogging or running and running stairs - it seems jarring type exercise is best, but any type of regular exercise helps!

**Treatment of Bone Density** depends on age and the presence of other risk factors for fractures. For all of us between 50 and 70, the best prevention is oral calcium (see our Calcium Article) with Vitamin D to increase calcium absorption and regular weight bearing exercise. Estrogen replacement for women seems to do a good job of maintaining bone density, and perhaps even building bone density, but the many side effects we are discovering (breast cancer and uterine cancer) outweigh its benefits in my mind! New drugs such as risedronate (Actonel) and alendronate (Fosamax) and to a lesser extent, calcitonin nasal spray (Miacalcin) do a better job of rebuilding bone density once osteoporosis is present. The long-term safety of alendronate is still unknown, especially with a half life in the bone of greater than 10 years, so it is not wise to use it for prevention unless there are other strong risk factors. I personally do NOT prescribe it or recommend it due to it’s long half life and unknown long term outcomes! Further, while it rebuilds bone density, we aren’t really sure that it will prevent fractures long term. In fact, the recent large FIT study (4,000 women) showed that in those with osteopenia, the percentage of women who developed new fractures after 4.5 years was 10% in women taking placebo and 11% in women taking alendronate.

There is no evidence that using a combination of these medications helps to prevent osteoporotic fractures - but it does add to the expense and potential toxicity. Another option for the 50-70 year old woman with osteopenia who doesn't want to take estrogen due to the breast cancer risk may want to look at
raloxifene (Evista). This is an estrogen like medication that also seems to suppress breast cancer, like its "cousin" medication tamoxifen, that we have used for years to prevent breast cancer recurrence after treatment!

Osteoporosis is a serious disease and prevention is vital! However, recent advertising has led many women to think that they are much worse than they really are (hoping to scare them into taking drugs that they do not need). Young women with osteopenia should not be frightened, but should be concerned enough to discuss management with their physician so that they do not develop osteoporosis in the future. Elderly women with osteopenia are above average for their age and don't require more than regular physical activity and a good intake of calcium. Talk to your family doctor and get the facts!