

#### \*DENTAL IMPLANT RISK FACTORS

The following are directly associated with a higher rate of implant failure (in less than 5 years). Many studies associate a 2-5% failure rate of implants. This is similar to my own experiences. I recently tracked implants placed for 4 years from 2008 to 2011 (over 3,000 implants), and noted a 98.2% success rate (or a failure rate of 1.8%).

In several studies factors have been identified which correlate to higher rates of implant failures. For instance, in some patients the risk of failure may increase from 2% to 8%. Another way of looking at this is that healthy young patients with adequate bone for an implant have a 95-98% success rate. Patients with some of the following risk factors have success rates drop from 95-98% to 88-95%. Fortunately, that is still a high success rate. Patients with more than one risk factor may have even higher risks of implants failing in less than 5 years.

- **DIABETES** (2.7x greater risk of implant failure within 5 years)
- **HEAD AND NECK RADIATION** (2.7x greater risk of implant failure within 5 years)
- **AGE** patients over 60 years of age have a higher rate of implant failure versus patients between the ages of 40-59. (2.2x greater risk of implant failure within 5 years)
- **CORTICOSTEROIDS** used for chronic conditions such as rheumatoid arthritis, asthma, lung disease, and inflammatory bowel disease. In particular, corticosteroid drugs such as Prednisone, Prednisolone and Dexamethasone are very damaging to bone, as they both reduce the body's ability to absorb calcium and speed up bone resorption.
- **HORMONE REPLACEMENT** patients, frequently women undergoing hormone replacement therapy have (in some studies) a (2.5x greater risk of implant failure within 5 years)
- **SMOKING** contributes to poor metabolism, and is also believed to cause women to enter menopause earlier, putting them at risk earlier.
- **HIGH ALCOHOL INTAKE** limits the stomach's ability to produce hydrochloric acid, which is necessary for the absorption of calcium and magnesium; when magnesium is lost in the urine, it takes calcium with it.

#### \*General bone loss (osteoporosis) risk factors

The following are risk factors for bone loss, bone density loss (osteoporosis).

These do not necessarily relate directly to increased risk of implant failure. Osteoporosis most often develops as a result of the aging process, in some cases it can be triggered by another illness or use of certain medications.

While osteoporosis and normal bone healing around implants are different processes, the following may combine with previously listed direct risk factors to increase the risk of implant failure:

- **ANTICOAGULANTS** Warfarin (Coumadin) or Heparin, are used for treating heart disease to reduce the risk of heart attacks and strokes, as well as to reduce blood clots in people undergoing or recovering from surgery. Anticoagulants work by reducing the effects of vitamin K, which helps calcium bind to bone tissue.
- **ANTICONVULSANTS** drugs for treating epilepsy, are now also widely used for treating mood disorders such as bipolar disorder, as well as fibromyalgia, and nerve pain. Examples include Carbamazepine (Tegretol) and Pregabalin (Lyrica). These drugs interfere with vitamin D metabolism, reducing the body's ability to absorb calcium and leading to bone loss.
- **ANTI-ANXIETY MEDICATIONS** Clonazepam (Klonopin), Diazepam (Valium) and Lorazepam (Ativan) and similar medications inhibit vitamin D metabolism, leading to bone loss.
- **AROMATASE INHIBITORS** drugs used to treat breast and ovarian cancer in post-menopausal women. They work by disrupting the production of estrogen, which leads to accelerated bone loss as a side-effect of the cancer treatment.
- **DIURETICS** prescribed for high blood pressure, congestive heart failure, liver disease and kidney disease to increase urination to reduce fluid throughout the body. Some diuretics, such as the

commonly prescribed Furosemide (Lasix), cause the kidneys to excrete more calcium, which can lead to bone loss.

- **IMMUNOSUPPRESSANTS** stifle the body's immune system reaction after a graft or organ transplant. They are also used to treat psoriasis, Crohn's disease, and other autoimmune diseases. However, they also hinder the formation of new bone.
- **KIDNEY DIALYSIS SOLUTIONS AND ANTACIDS** contain aluminum, which disrupts the calcium-phosphorus balance necessary for bone formation, thereby contributing to bone loss. Other acid reflux drugs, such as Prilosec, Prevacid, and Nexium for treating gastroesophageal reflux disease (GERD) and heartburn, reduce the acid in the stomach, thereby interfering with calcium absorption and contributing to bone loss.
- **ORAL CONTRACEPTIVES** may have a negative long-term effect on bone health. Oral contraceptives elevate the sex hormone binding globulin (SHBG) levels, and those elevated levels persist even after the pills are stopped. Osteoporosis may develop as a result of impaired androgen activity due to the elevated SHBG levels.
- **LACK OF EXERCISE** especially weight-bearing exercise, accelerates bone loss. The phrase ~~the~~ it or lose it\*applies especially to bone health.