

## **BISPHOSPHONATES & DENTAL CONSIDERATIONS**

Compiled by Charles (Chuck) Maack – Prostate Cancer Activist/Mentor

**DISCLAIMER:** Please recognize that I am not a Medical Doctor. I have been an avid student researching and studying prostate cancer as a survivor and continuing patient since 1992. I have dedicated my retirement years to continued research and study in order to serve as an advocate for prostate cancer awareness, and, from a activist patient’s viewpoint, to voluntarily help patients, caregivers, and others interested develop an understanding of prostate cancer, its treatment options, and the treatment of the side effects that often accompany treatment. There is absolutely no charge for my mentoring – I provide this free service as one who has been there and hoping to make your journey one with better understanding and knowledge than was available to me when I was diagnosed so many years ago. Readers of this paper must understand that the comments or recommendations I make are not intended to be the procedure to blindly follow; rather, they are to be reviewed as my opinion, then used for further personal research, study, and subsequent discussion with the medical professional/physician providing your prostate cancer care.

### **BE SURE TO READ ALL THE WAY TO THE VERY END OF THIS PAPER!**

The below is information I have compiled and saved to my files regarding the use of bisphosphonates or the monoclonal antibody denosumab as Xgeva or Prolia when treating osteopenia and osteoporosis, or when prescribed because of being administered androgen deprivation medications, particularly LHRH agonists or antagonists that are known to have an effect on bone mineral density and resorption. **IMPORTANT TO NOTE MEDICARE AUTHORIZATION REQUIREMENTS:** For Medicare patients, denosumab prescribed as Prolia is “indicated as a treatment to increase bone mass in men at high risk for fracture receiving androgen deprivation therapy for non-metastatic prostate cancer.” On the other hand, Medicare requires that to be eligible for administration of denosumab as Xgeva, the prostate cancer patient must be experiencing “bone metastases from solid tumors for the prevention of skeletal-related events” and “is

approved for the treatment of hypercalcemia or malignancy (HCM) refractory to bisphosphonate therapy.” **THUS, MEDICARE DOES NOT AUTHORIZE XGEVA FOR PATIENTS NOT YET EXPERIENCING METASTASES.** Rather, Prolia or Zometa should be prescribed.

**IN THAT THE HALF-LIFE OF BISPHOSPHONATES IN THE SYSTEM CAN RANGE TO TEN YEARS AND LONGER AND THE MONOCLONAL ANIBODY DENOSUMAB UP TO TWO MONTHS, PLEASE BE SURE TO READ ALL THE WAY TO THE END OF THIS PAPER TO RECOGNIZE THE EXTREME IMPORTANCE OF DENTAL CONSIDERATIONS PRIOR TO THE ADMINISTRATION OF BISPHOSPHONATES OR THE MONOCLONAL ANTIBODY DENOSUMAB AS XGEVA OR PROLIA.**

**I JUST CANNOT EMPHASIZE ENOUGH “HOW IMPORTANT” THIS IS !!**

**ADHERING TO THESE CONSIDERATIONS SERVES TO AID IN THE PREVENTION OF MEDICATION-RELATED OSTEONECROSIS OF THE JAW (MRONJ).**

**EVERY PATIENT BEING CONSIDERED FOR THE PRESCRIBING OF A BISPHOSPHONATE OR DENOSUMAB AS XGEVA SHOULD “ALWAYS” GET DENTAL CLEARANCE “BEFORE” THE MEDICATION IS ADMINISTERED.**

**AS NOTED BY MEDICAL ONCOLOGIST STEPHEN B. STRUM, M.D., FACP, A SPECIALIST SPECIFICALLY IN RESEARCH AND TREATMENT OF RECURRING OR ADVANCED POSTATE CANCER SINCE 1983, THAT “CLEARANCE” SHOULD BE A FORMAL NOTE FROM A DENTIST OR ORAL SURGEON THAT SPECIFIES:**

***“NO INVASIVE DENTAL WORK IS INDICATED AND THERE ARE NO CONTRA INDICATIONS TO THE PRESCRIBING OF ANTI-RESORPTIVE BISPHOSPHONATES SUCH AS ZOMETA/ZOLEDRONIC ACID OR XGEVA/DENOSUMAB.”***

**WITH DENTAL ISSUES TAKEN CARE OF AHEAD OF TIME, MRONJ ALREADY IN EARLY DEVELOPMENT MAY BE RECOGNIZED BY IMAGING PERFORMED BY THE DENTIST/ORAL SURGEON DESPITE**

**NO EARLIER SIGNS OF ANY SIDE EFFECTS, AND SHOULD THAT BE THE CASE, THE ADMINISTRATION OF EITHER ZOMETA OR XGEVA SHOULD NOT BE PERFORMED SINCE THEY COULD PROVIDE THE IMPETUS TO EXACERBATING AND FUELING THE ALREADY PRESENT MRONJ CONDITION.**

To anyone expecting to be prescribed bisphosphonates or the monoclonal antibody denosumab as a treatment for the foregoing reasons, or actually any reason, the information below is important for the patient to review and fully discuss with both his physician prescribing the treatment and with his dentist prior to any administration of these medications. The physician and dentist should be aware of each other in the event any dental work may become required once being treated.

The nitrogen producing bisphosphonates, among which is the commonly prescribed Zometa/zoledronic acid, have been found to be the culprits to subsequent ONJ. However, I have learned that the reason the nitrogen producing bisphosphonates have been those prescribed is because they are well absorbed and thus more effective than the clodronate and other non-nitro producing bisphosphonates that are much slower in activity and effectiveness. The jury is currently out but being looked into by some sources as to moving away from these nitro-producing bisphosphonates. **Of more recent interest (August 2015) this study <http://tinyurl.com/p6ey2s5> reports that the administration of zoledronic acid/Zometa could be reduced to every 12 weeks than the more often prescribed every 4 weeks with the same effectiveness. As noted: “The study concluded that administering zoledronic acid every 12 weeks is noninferior to administering the drug every 4 weeks.”** **If you are being prescribed administration of Zometa every 4 weeks, bring this reference paper to the attention of your treating physician.** Xgeva/denosumab, though also a medication that can result in ONJ, is considered much less likely to do so, though it appears that if there was any indication of ONJ already in early development, this medication could then exacerbate that condition to fully recognized MRONJ.

**AGAIN, NOTE THE IMPORTANCE OF COMPLETING ALL IMAGING OF THE JAWBONE AND COMPLETION OF DENTAL ISSUES BEFORE BEGINNING THE ADMINISTRATION OF EITHER ZOMETA OR XGEVA.**

**IF FOUND TO BE EXPERIENCING LOOSENING TEETH OR SOME SORENESS AROUND THE GUMS/JAW, THIS COULD BE A SIGN OF**

**MEDICINE-RELATED OSTEONECROSIS OF THE JAW/MRONJ DEVELOPMENT AND YOU SHOULD FIND A ORAL AND MAXILLOFACIAL SURGEON WHO IS MORE APT TO RECGONIZE AND HAVE EXPERIENCE IN THE TREATMEN OF ONJ. A RHEUMATOLOGIST WITH EXPERIENCE IN TREATING ONJ COULD ALSO BE VISITED. MOST DENTISTS OR PERIDONTISTS ARE NOT FAMILIAR WITH THIS RESULT OF BISPHOSPHONATE/DENOSUMAB USE. PLEASE REVIEW THIS PAPER FOR FURTHER INFORMATION: <http://tinyurl.com/kczu3op>**

One of our fellow prostate cancer patients experienced Osteonecrosis of the Jaw and provided this relating of his experience....please read his words completely:

“My dentist and periodontist could not diagnose the problem that I experienced starting February, 2014. I had been on Zometa until June, 2011, and got off Xgeva in August, 2013. They tried antibiotics and then two rounds of perio surgery. The four lower incisors would not firm up in the jaw bone. I asked the periodontist if it could be ONJ and he said no way. After one of the incisors fell out in August, he said maybe it could be ONJ and sent me to an oral and maxillofacil surgeon. He almost immediately diagnosed ONJ caused by bisphosphonate use, primarily Zometa. Since I had been off Zometa for three years, I was a little more than surprised! He then informed me that the half life of Zometa is about twelve years and any invasive dental or perio work can trigger ONJ,

Treatment involved beginning a fairly heavy dose of Amoxicilln, Pentoxifyilline, and Vitamin E. He performed surgery in August, 2014, removing the three remaining lower

incisors and almost one half inch of dead bone between the two canine teeth that remained in solid bone. He proceeded removing bone until he found bone that would bleed. This was done with local anesthesia and after he had stitched it back together, he put in a partial plate I had to have made prior to surgery. The partial was to protect the surgical site and replace the four missing teeth. Recover was fairly quick and easy with stitches removed after one week. The "new" teeth take a little getting used to but have had no issues since.

A couple of lessons learned. If you even suspect ONJ and have been on bisphosphonates, don't let a dentist or periodontist do any heavy duty work in your mouth. (Remember that stuff is still in your system for twelve years or so.) Find an oral maxillofacial surgeon who has had experience with ONJ, specifically medicinal (bisphosphonate) related ONJ. I found mine in Charlotte NC but he said the doctors that treat ONJ are few and far between. The other lesson learned is that Medicare would not cover the removal of the teeth or the cost of the partial. Common sense says you cannot remove dead jaw bone and keep the teeth in place. The partial they thought of as a cosmetic device so I wouldn't be gap toothed!"

**ALL PATIENTS PRESCRIBED ZOMETA OR XGEVA SHOULD ALSO BE DIRECTED TO PURCHASE A COMPREHENSIVE BONE SUPPLEMENT (CBS) TO PREVENT LOW CALCIUM LEVELS THAT ARE IMPLICATED IN OSTEONECROSIS OF THE JAW. I highly recommend considering the purchase of a formula developed by Medical Oncologist Strum known as "Strum's Intensive Bone Formula." This bone supplement is**

available from Life Extension Foundation (LEF). See <http://tinyurl.com/66lwqy5> . The content is explained below:

## Supplement Facts

Serving Size 10 capsules

Servings Per Container 30

---

Amount Per Serving	
Vitamin D3 (as cholecalciferol)	8000 IU
Vitamin K2 (as menaquinone-7)	200 mcg
Calcium [as DimaCal® (Dicalcium Malate)]	800 mg
Magnesium (as magnesium citrate)	400 mg
Zinc (as zinc citrate)	10 mg
Potassium (as potassium citrate supplying 30 milliequivalents potassium)	1173 mg
Winged treebine ( <i>Cissus quadrangularis</i> ) extract (aerial part) [std. to 10% ketosterones (60 mg)]	600 mg
Boron (from boron citrate, aspartate, glycinate)	6 mg
Silica [from standardized Bamboo ( <i>Bambusa vulgaris</i> ) extract (stem)]	5 mg
Other ingredients: vegetable cellulose (capsule), vegetable stearate, silica,	

---

maltodextrin.

---

## **Dosage and Use**

- Take three capsules in the morning, three capsules in the afternoon and four capsules in the evening daily with meals, or as recommended by a healthcare practitioner.

## **Caution**

Individuals consuming more than 2,000 IU/day of vitamin D (from diet and supplements) should obtain a serum 25-hydroxy vitamin D measurement. Do not exceed 10,000 IU per day unless recommended by your healthcare provider. This product is not recommended for individuals with high blood calcium or potassium levels. Because potassium may have numerous drug interactions (most commonly, diuretics and blood pressure medications), consult your healthcare provider before taking this product if you are taking prescription medications and/or have heart or kidney disease. Due to the vitamin K, consult your healthcare provider before taking this product if you are taking anti-platelet or anti-coagulant medications, or have a bleeding disorder.

This could be considered an expensive formula at around \$50 per month, but when considering that it replaces separate purchases of the vitamins listed, and is comprehensive for bone health in its formulation content, that price is not as significant.

Patients with other health issues should read the information at the following website before embarking on bisphosphonate treatment (a few examples: Chronic kidney disease stages 4 or 5, low serum calcium, osteomalacia, Vitamin D deficiency until it is corrected, serious esophageal disease, patients at bed rest who cannot stay upright for an hour). Also in this paper “Atrial Fibrillation” has a “question mark” associated with the words apparently uncertain of this concern since in the past the FDA apparently did not see this effect of concern. More recent study indicates that at the least, patients at high risk for AF, those who are

older or have a history of cardiac events, should be closely monitored – so please take note.

<http://courses.washington.edu/bonephys/opbis.html>

Please take note, also, that denosumab is not approved for patients with multiple myeloma or other cancers of the blood. An important role that Matthew Smith, MD, PhD, at Massachusetts General Hospital has determined in focusing on the role of over-expression of RANK Ligand, a natural molecule that supports bone metabolism and bone integrity, is that denosumab has shown to inactivate RANK Ligand and prevent bone destruction and fractures. A recent study indicates that early initiation of denosumab can prevent or at least delay the onset of bone metastasis. See: <http://www.medicalnewstoday.com/releases/237749.php> . Also see the following that supports the prescribing of denosumab:

<http://www.ncbi.nlm.nih.gov/pubmed?term=PMID%3A%2022943116>

If being prescribed Fosamax (Alendronate), a less strong bisphosphonate in tablet form, the medication as 70mg tablets usually comes as four tablets in a folded packet to last four weeks. One tablet is taken per week, taken on the same day of every week, preferably taken immediately upon rising for the day while stomach is empty, taken with 6-8 oz. of water to thoroughly wash the tablet down, and no other meds or food are to be taken for at least 30 minutes. You must remain up and out of bed and active after taking this medication. When I had been taking Fosamax I made up a sign with the large letters FOSAMAX on it that I placed near my bed that could not help but catch my eye upon rising so that I would remember to take the pill immediately upon rising. I took mine every Sunday morning.

If a stronger, intravenous bisphosphonate is prescribed such as Zometa (Zoledronate) or Aredia (Pamidronate), "insist" the initial dose be administered at a lowest dose possible and be administered over a longer than "usual" time frame to permit your system to tolerate the medication and minimize the chance of Acute Phase Response (APR) before increasing to what is considered a "normal" dose. Many Medical Oncologists use the argument "I've never heard of any of my patients experiencing any side effects." I seriously do not believe that to be fact, unless patients just fail to bring these side effects to the attention of their physician once they are over them. I've heard of way too many men who, within the next 28 to 36 hours after bisphosphonate intravenous administration certainly did experience extremely uncomfortable side effects of flu-like symptoms, bone pain,

kidney damage, and becoming bed-ridden for a few days after administration of intravenous bisphosphonates at full strength. The "normal" dose can be administered when returning for your second treatment. For Zometa, the initial dose to "insist" on is 1mg over at least 30 minutes. Your second and future dosage can be increased to what is considered "normal" - usually 4mg. For Aredia, the initial dose to "insist" on is 30mg over at least 1 1/2 hours. Your second and future dosage can be increased to what is considered "normal" which I believe is 60-90mg every two weeks thereafter. In the administration of either Zometa or Aredia at full dosage you have every right to "insist" that the infusion be timed to more than 30 minutes for Zometa and at least 1 1/2 to even 2 hours for Aredia. They may try to push the infusion to a shorter time period but stick to your "rights" and remind them that this is YOUR body in which the medication is being administered and you want as little side effect as possible. **And keep in mind the important information provided you above: If you are being prescribed administration of Zometa every 4 weeks, bring this reference paper <http://tinyurl.com/p6ey2s5> to the attention of your treating physician that administration can be extended to every 12 weeks.**

Interesting to note is that Zoledronic acid (Zometa), in addition to its role in prevention of skeletal-related events, also directly suppresses cell proliferation and induces apoptosis in prostate cancer cells.

The newer drug, denosumab, rather than an oral medication or lengthy infusion, is administered as a subcutaneous injection in the upper arm, upper thigh, or abdomen. This medication comes in two strengths: for osteopenia, rather than Fosamax, denosumab as Prolia can be administered at 60mg to last six months; for osteoporosis or known metastasis to bone, rather than Zometa or Aredia, denosumab as Xgeva can be administered monthly at 120mg.

I thought the below two advisories from Medical Oncologist Stephen Strum may interest you:

**Per Dr. Strum:** "BEPs (Biological End Points) such as DpD (deoxypyridinoline) and b-CTX (C-Terminal Telopeptide, b-Crosslaps) should be used to decide on how often Xgeva is given. Remember too, the GOLDILOCKS maxim: "Not too hot, not too cold, but just right." This is true of all biological systems and the concept of BEPs is applicable here. We want to see the DpD and the CTx drop to low values but we can hold the Xgeva (or Zometa) if way way low to prevent what

is called adynamic bone disease (ABD), which one day will be correlated with ONJ (osteonecrosis of the jaw).”

**Further from Dr. Strum:**

**This is a group email. Its goal is to alert you to issues that relate to the potential for a serious side effect of bisphosphonate use in those having invasive dental work.**

**I believe I have one of the largest experiences with the use of bisphosphonates, both intravenous & oral. I have not seen the side effect called “avascular necrosis” or “osteonecrosis of the jaw”. Others have seen this & the reported incidence has been reported as between 1% & 5%. You will see in the attached file that some say that in those having dental extractions or dental implants this can be as high as 80%.**

**I suggest you read the attached file. If you wish more information do a Google search on bisphosphonates osteonecrosis or bisphosphonates avascular necrosis. I hope to soon have a website where these articles will be posted.**

**In the meantime, pay attention to the need for a DENTAL EVALUATION prior to starting on bisphosphonate therapy (especially intravenous bisphosphonates like Zometa or Aredia) & strongly consider dental evaluations while on such therapy. Share the attached file with your dentist & any other pertinent medical reference(s). Avoid invasive dental procedures such as extractions or implants. If there is an issue challenging this, seek an oral surgeon or contact one of the authors specializing in avascular necrosis of the jaw relating to bisphosphonate therapy.**

**Lastly, I believe it is possible that I have not seen this problem because I advise my patients to use a comprehensive bone supplement. (My note: see page 3, above)**

**In the past, issues of bone brittleness relating to therapies using Fluoride or Bisphosphonates have come up. In both situations, I have found that such a problem relates to NOT supplying the patient with the needed raw materials**

**to make healthy bone. And, one other point. This process is called avascular necrosis & drugs which inhibit angiogenesis might be working with bisphosphonates to create SYNERGISTIC TOXICITY. It is known that part of the mechanism of action of bisphosphonates is that of anti-angiogenesis. Therefore, think carefully when adding additional anti-angiogenesis agents to bisphosphonate therapy. This includes drugs like thalidomide, tetracyclines, and COX II inhibitors like Celebrex. These may be found to be risk factors.**

**“The Doctor of the Future will give no medicine, but will interest his patients in the care of the Human frame, in diet, and in the cause and prevention of disease.”**

**--Thomas Edison**

**“He is a better physician that keeps diseases off us, than he that cures them...prevention is so much better than healing because it saves the labour of being sick.”**

**Thomas Adams, 1618**

**The superior doctor prevents sickness;  
The mediocre doctor attends to impending sickness;  
The inferior doctor treats actual sickness.**

**--Chinese Proverb**

**He who cures a disease may be the skillfullest, but he that prevents it is the safest physician**

**--T. Fuller**

**My regards to all,**

**Stephen**

**Stephen B. Strum MD, FACP  
Medical Oncologist Specializing in Prostate Cancer**

**(MY NOTE Regarding Jarrow Bone Up: Dr. Strum, recommends patients use Jarrow Bone Up 6 tablets daily to satisfy appropriate Calcium intake for any bone**

issues as well as about 8-10% of daily Vitamin D intake. He recommends taking 4 or 5 per day and pending calcium levels & ideally intact PTH levels one may need to add a little more. Jarrow's products involve taking 6 per day to equal 1,000mg Calcium so one has latitude in using less than the 6 per day. Also, ideally the intake of calcium is best done more towards the evening so he recommends weighting dosing in that way. All of this must take into account the use of bisphosphonate drugs, as well as any vitamin D supplementation. Jarrow Bone Up is likely available in most health food stores and can be ordered via the internet.

Example: <http://www.herbsmd.com/detail/Bone-Up-1621.htm>

**Further to my note:** With the availability of “Strum’s Intensive Bone Formula” since Dr. Strum’s earlier recommendation of Jarrow Bone Up, I would reason that his new formula will be much more effective to address bone issues.

**PLEASE TAKE VERY SPECIAL AND IMPORTANT NOTE OF THE FOLLOWING that was the attachment to Dr. Strum’s report, above, and taken from this important to read paper – THIS IS REALLY “SERIOUS INFORMATION” TO BE AWARE!**

### **Bisphosphonate-Induced Exposed Bone**

**(Osteonecrosis/Osteopetrosis) of the Jaws: Risk Factors, Recognition, Prevention, and Treatment Robert E. Marx, DDS,\* Yoh Sawatari, DDS, Michel Fortin, DMD, PhD, and Vishtasb Broumand, DMD, MD'**

**2005 American Association of Oral and Maxillofacial Surgeons J Oral Maxillofac Surg 63:1567 1575, 2005**

<http://spindlerperio.tripod.com/joms.pdf>

## **RECOMMENDATIONS TO PREVENT BISPHOSPHONATE AVASCULAR NECROSIS**

Before Initiating Bisphosphonate Therapy

As soon as the treating oncologist prescribes bisphosphonate therapy (**MY NOTE: or DENOSUMAB AS PROLIA OR XGEVA, AND BEFORE BEGINNING THE MEDICATION**), the patient should be referred to an experienced dentist or oral and maxillofacial surgeon for an urgent examination. Close and ongoing communication between your physician and dentist is crucial, and commencement of bisphosphonate therapy should be deferred until dental and oral surgical treatments have been completed. **At the minimum, the dental examination should consist of clinical and panoramic radiographic examinations with individual periapical films where indicated. Dental treatment is aimed at eliminating infections and preventing the need for invasive dental procedures in the near and intermediate future.** This may include tooth removal, periodontal surgery, root canal treatment, caries control, dental restorations, and dentures. These patients should not be considered as candidates for dental implants, which have no crevicular epithelial attachment and therefore would predispose the patients in this group to bone exposure. **Impacted teeth that are completely covered by bone or soft tissue should be left undisturbed, but those with an oral communication are recommended to be removed and given a 1 month healing period.** Similarly, small lingual mandibular tori do not require removal whereas large, multilobed mandibular tori or midline palatal tori with thin overlying mucosa are recommended to be removed 1 month before the initiation of bisphosphonate therapy. **Prophylactic antibiotic coverage for noninvasive dental care is not required but is recommended for any invasive dental procedure,** and for this penicillin remains the drug of choice. **For individuals with a penicillin allergy, combination therapy using quinolones and metronidazole or erythromycin and metronidazole are good second choices and have proven efficacy in this group. Clindamycin alone is not recommended because of its lack of activity against actinomyces, Eikenella corrodens, and similar species that have been found to frequently colonize this exposed bone.**

As a general rule, if the patient requires only noninvasive dental care, such as dental cleanings (prophylaxis), fluoride carriers, dental restorations, dentures, and so forth, bisphosphonate therapy need not be delayed. If the patient requires invasive dental procedures such as **tooth removals, periodontal surgery, or root canal therapy, commencement of bisphosphonate therapy should be deferred for 1 month to allow sufficient time for bone recovery and healing.** Once the regimen of bisphosphonate therapy has begun, **a surveillance schedule of once every 4 months is recommended.**

SIMILAR TO THE ABOVE, WHILE RECEIVING BISPHOSPHONATE THERAPY Oncologists should consider referring all patients already receiving IV bisphosphonates to a dentist or oral and maxillofacial surgeon for an examination and a surveillance schedule. The dental team should carefully evaluate the **oral cavity for exposed bone in the areas most commonly affected, such as the posterior lingual area of the mandible, and for radiographic evidence of osteolysis, osteosclerosis, widened periodontal membrane spaces, and furcation involvements.** A dental cleaning and fluoride carriers should be considered, and **tooth removal should be avoided if at all possible. If the tooth is nonrestorable because of caries, root canal treatment and amputation of the crown is a better option than removing the tooth. Similarly, teeth that demonstrate 1 or 2 mobility should be splinted rather than removed.** If the mobility is 3 or more or is associated with a periodontal abscess, there is a strong possibility that osteonecrosis is already present and the abscess and/or granulation tissue is merely covering exposed bone. In these situations, removing the tooth and providing antibiotic treatment, as described in the previous section, is the only recourse. Elective surgery within the jaws, such as removal of third molar teeth or tori, periodontal surgery, or placement of dental implants, is strongly discouraged at this time. Denture wearing is acceptable, but the prosthesis should be examined for areas of excessive pressure or friction and given a soft reline if needed.

. Close and ongoing communication between your physician and dentist is crucial, and commencement of bisphosphonate therapy should be deferred until dental and oral surgical treatments have been completed. **At the minimum, the dental examination should consist of clinical and panoramic radiographic examinations with individual periapical films where indicated. Dental treatment is aimed at eliminating infections and preventing the need for invasive dental procedures in the near and intermediate future.** This may include tooth removal, periodontal surgery, root canal treatment, caries control, dental restorations, and dentures. These patients should not be considered as candidates for dental implants, which have no crevicular epithelial attachment and therefore would predispose the patients in this group to bone exposure. **Impacted teeth that are completely covered by bone or soft tissue should be left undisturbed, but those with an oral communication are recommended to be removed and given a 1 month healing period.** Similarly, small lingual mandibular tori do not require removal whereas large, multilobed mandibular tori or midline palatal tori with thin overlying mucosa are recommended to be removed 1 month before the initiation of bisphosphonate therapy. **Prophylactic antibiotic**

coverage for noninvasive dental care is not required but is recommended for any invasive dental procedure, and for this penicillin remains the drug of choice. For individuals with a penicillin allergy, combination therapy using quinolones and metronidazole or erythromycin and metronidazole are good second choices and have proven efficacy in this group. Clindamycin alone is not recommended because of its lack of activity against actinomyces, Eikenella corrodens, and similar species that have been found to frequently colonize this exposed bone. As a general rule, if the patient requires only noninvasive dental care, such as dental cleanings (prophylaxis), fluoride carriers, dental restorations, dentures, and so forth, bisphosphonate therapy need not be delayed. If the patient requires invasive dental procedures such as tooth removals, periodontal surgery, or root canal therapy, commencement of bisphosphonate therapy should be deferred for 1 month to allow sufficient time for bone recovery and healing. Once the regimen of bisphosphonate therapy has begun, a surveillance schedule of once every 4 months is recommended.

**NOW, IF YOU TOOK THE TIME TO READ ALL THE WAY TO HERE, HERE IS AN IMPORTANT CONSIDERATION TO DISCUSS WITH YOUR TREATING PHYSICIAN**

**Dr. Strum recommends that if your urine DpD (deoxypyridinoline) level is < 5 and your serum CTx is < 300, you can hold off on that next Zometa or Xgeva injection.** (I would add, then do follow-up checks of the foregoing levels no later than every three months to insure these levels are maintained. If elevating, then return to your former medication).