



# BONE RESORPTION URINE TEST

## Collagen Cross-Linked N-Telopeptide (NTx) & Creatinine

By Dr. Donna F. Smith

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## INTRODUCTION

### Diagnos-Techs, Inc. Laboratory Report

According to Diagnos-Techs, Inc., as one scientific source,

- The medical industry's approach to diagnosing osteoporosis and risk of fracture is Bone Densitometry (mineralized bone mass) using radioactive and x-ray techniques. This is Dual Energy X-ray Absorptiometry, referred to as the DEXA, DXA Scan and/or The Bone Density Test.
  - According to Janet Lang, D.C., the DEXA Scan is the medical industries best approach to measuring bone density. More on Bone Density Testing below.
- Unfortunately, the different diagnostic modalities in use today have limitations in reliability and reproducibility, and specifically in fracture-prediction capabilities.
- More recent technology has allowed the development of “urinary” assays for bone resorption markers. (In other words, Diagnos-Techs, Inc. is referring to urine tests, such as our Bone Resorption Test.)

Diagnos-Techs, Inc. refers to the urinary assays as a “complementary” method to Bone Mineral Density (DEXA Scan) in the diagnosis and follow-up of osteoporotic patients, and although medical information on the DEXA Scan reports it as “safe” with minimal Radiation exposure, in my opinion, exposing my body to even a minimal amount of radiation would be putting my body at risk of complications due to radiation poisoning. In other words, though there are lethal levels vs. non-lethal levels, a poison is still a poison no matter how much is in your body.

And what the medical industry does consider is the fact that we are exposed to radiation every day, it is in the air, it comes from microwaves, military testing, and so on. So, even a small amount of radiation poisons added to the amount already within your body, becomes accumulative over time and increases the total toxic load of radiation within the body.

From what I have read, I am of the opinion that the medical industry, including the FDA, considers anything safe as long as it does not instantly kill you. Do they even consider the consequences of accumulative poisons over the time?



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For example, the FDA considers chemical food additives and colorings safe if the amount in a single container does not exceed their GRAS list. GRAS means Generally Recognized As Safe.

However, have you seen how many containers are in the grocery baskets at the checkout counter, even your own, for that matter?

Even though each container has passed the GRAS list, people do not consume the contents of only one container. They consume the contents of multiple containers every week. And it is that cumulative effect that increases toxicity levels in the body and promotes diet-related diseases.

The higher the toxicity, the higher the nutrient depletion at a cellular level because chemicals, just like the chemicals in drugs, deplete the nutrients in our cells.

Therefore, as toxicity and nutrient deficiencies increase from week to week of consuming GRAS container foods, in time the cells become severely malnourished, then they decay (rot) and die.

The more decaying and dead cells in an organ or gland, the faster the organ and gland reaches the disease stage, where either they must have surgery to remove the diseased organ or gland, or they if this is not possible, the body dies. That is unless they start Clinical Nutrition in time to reverse this process.

However, as long as each container is on the GRAS list, the FDA is satisfied.

Regarding cumulative radiation, according to the late Robert Marshall, Ph.D., C.C.N. just one airplane flight exposes the body to radiation that is equivalent to the amount we would be exposed to in one year staying on the ground.

So, to me, why add more radiation to my body, when there is a non-invasive, safer and easier way to test my bone health, that does not expose me to more radiation, like our Bone Resorption urine test.

Therefore, in my opinion, there is nothing “complementary” to using urinary assays, it is the preferred method for assessing my bone health.

Note: Diagnos-Techs, Inc. is one of the first laboratories I used and thus the above is from educational materials I received from them at that time.



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## Complementary or Fundamental Health Care Services

To put this in proper perspective, a few decades ago, the term “complementary” [or more exact, “complementary to medicine”] became a preferred term in place of the term “alternative” for any therapy or diagnostic method that was non-medical.

However, if you stop and think for a moment, there are two additional considerations:

1. Why should all other therapies be considered “complementary” to medicine? Each therapy has its own equal value in the healthcare or disease management industry. Medicine is not superior to other therapies; it just simply provides a different service.

And if you do any historical research, you will learn that naturopathy and homeopathy were healthcare therapies, long before the field of medicine was established and centuries before medicine became known as the disease management industry, because drugs manage the symptoms of disease, they cannot heal the cause of disease symptoms.

2. Still, the above issue completely overlooks the fundamental requirements of the human body that Clinical Nutrition provides. Think of it this way, the human body would be dead within minutes without air, within a couple of weeks without water, and in less than two months without food.

So, since air, water and food are the requirements of **life itself**, this means that they are the “fundamental” substances required in purity and sufficiency that also determines the state of “health” of the human body.

Therefore, Clinical Nutrition Testing and Therapy can never be an alternative or complementary healthcare service, it is a **fundamental requirement for every human being**, if they want to restore and maintain optimal health, and prevent disease. This is why our Clinical Nutrition Therapy succeeds in helping our clients, where other therapies may have provided you with either temporary relief or no relief at all.

***Because all other therapies, including medicine,  
are less effective, when Clinical Nutrition Therapy  
is not provided at the same time.***



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## Clinical Nutrition Is Required With All Other Therapies

For example, the reason Chiropractic require ongoing patient spinal adjustments, is because if you do not have the nutrients in the tissue around the vertebrae, the vertebrae cannot stay in place after the adjustment. Hence, the patient must keep having ongoing re-adjustments.

Therefore, if you are thinking of starting chiropractic, physical therapy or any structural related therapy, contact me for therapeutic supplements to support your Musculo-Skeletal System (muscles and bones), then take them for at least three weeks before you start any of these therapies.

If you are already receiving one or more these therapies, then contact me right away to start the therapeutic supplements your body requires to support your particular health challenges in the Musculo-Skeletal system.

Then you will be able to get the most out of these other therapies and your body will be able to heal even faster.

Because Clinical Nutrition therapy is fundamental, i.e., required along with any other therapy, you will always get faster results when you add Clinical Nutrition therapy.

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## BONE RESORPTION URINE TEST

### What is a Bone Resorption Urine Test?

Your Bone Resorption Urine Test is a measurement of Collagen Cross-Linked N-Telopeptide (NTx) and Creatinine. Bone resorption is the destruction of bone tissues that promotes bone loss. Bone loss is a decrease in bone mass and bone density.

Information on both of these will be provided in this document. I have also included information you may not be aware of regarding DEXA (DXA) scan, called the Bone Density Test, and caution about drug treatments for bone diseases.



# BONE RESORPTION URINE TEST

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## COLLAGEN CROSS-LINKED N-TELOPEPTIDE (NTx)

### What is NTx?

NTx is an abbreviation for N-terminal telopeptide. (More on this under NTx Chemistry and Bone Formation below). NTx is a **bone turnover marker** that can be measured from a urine or blood sample. My preference for you and me, is urine – it does not require being stuck with a needle. LOL

*Think of the collagen cross-links like a rope.*

*A three-strand, cross-linked rope is considerably stronger than a one-strand rope.*

So, test results in the normal range indicate your collagen cross-linked bone fiber is still intact and you have strong, healthy bones.

Whereas, abnormal urine test results, mean your urine has particles of collagen cross-linked bone fiber in it. When the cross-linked bone fiber breaks down, the body removes these broken bits of bone fiber out of the body through the urine. The further your test values are out of optimal range, the weaker and unhealthy your bones become, and, in time, lead to any number of bone-related diseases.

N-telopeptide is a breakdown product of collagen. Therefore, NTx is an indirect measure of the rate of bone breakdown. N-Telopeptide is a biochemical marker of bone metabolism and is the most sensitive and specific indicator of bone resorption.

Abnormal values indicate thinning and weakening of bones, which is medically known as osteoporosis. It also indicates your risk of bone loss and fracture risk.

Therefore, physicians may use NTx as effective monitoring of antiresorptive therapy in patients treated for osteopenia, osteoporosis, Paget disease, or other metabolic bone disorders, unless the physician is still using the Bone Density Test to diagnose these diseases and disorders.

The NTx urine is a safer, non-invasive, “radiation-free,” reproducible assessment of your Bone Health, bone mass, bone density, and risk of bone fracture and thus, is a preferable test to a DEXA (DXA) Scan.

In Clinical Nutrition, Bone Resorption urine testing helps me monitor the repair, rebuilding (or regrowth) of new bone, bone metabolism, bone health maintenance, and prevention of bone diseases. I have observed abnormal Bone Resorption Test values return to normal values as early as six months.



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Though the time required varies per individual, the good news is that “building new healthy bones is possible through Clinical Nutrition Testing and Therapy.

### NTx Chemistry and Bone Formation

Human bone is continuously remodeled bone structure through a process of osteoclast-mediated bone formation and resorption, which can be monitored by measuring serum and urine markers.

According to the Mayo Clinic, approximately 90% of the organic matrix of bone is type I collagen, a helical protein that is cross-linked at the N- and C-terminal ends of the molecule.

The amino acid sequences and orientation of the cross-linked alpha 2 N-telopeptide of type 1 collagen make it a specific marker of human bone resorption. N-terminal telopeptide (NTx) molecules are mobilized from bone by osteoclasts and subsequently excreted in the urine. Elevated levels of NTx indicate increased bone resorption.

Bone turnover markers are physiologically elevated during childhood, growth, and fracture healing. The elevations in bone resorption markers and bone formation markers are typically balanced in these circumstances and of no diagnostic value.

By contrast, abnormalities in the process of bone remodeling can result in changes in skeletal mass and shape. Many diseases, in particular hyperthyroidism, all forms of hyperparathyroidism, most forms of osteomalacia and rickets (even if not associated with hyperparathyroidism), hypercalcemia of malignancy, Paget disease, multiple myeloma, and bony metastases, as well as various congenital diseases of bone formation and remodeling can result in accelerated and unbalanced bone turnover.

Unbalanced bone turnover, usually without an increase in bone turnover, is also found in age-related and postmenopausal osteopenia and osteoporosis.

In conclusion, urinary N-telopeptide can give reproducible results and be able to assist in the evaluation of the quantity as well as the quality in determining your risk of fracture. Hence, urinary N-telopeptide can be used as a diagnostic tool for diagnosing osteoporosis, in addition to monitoring your bone health for disease prevention.



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## Bone Resorption Urine Test Indications

Indications for this test, according to Laboratories providing the Bone Resorption Urine Test, are...

- Preliminary screening in patients with high risk for osteoporosis.
- Provides therapeutic monitoring during and after treatment of osteoporosis.
- An adjunct tracking tool in bone and mineralization assessment, whether an initial densitometry is performed, or not.
- Follow-up for monitoring efficacy of hormone replacement therapy in the prevention of osteoporosis in both genders.
- Hip-fracture risk prediction in the elderly.
- Metabolic Bone Disease.
- Rheumatoid Arthritis and other connective tissue diseases.
- Paget's Disease.
- Bone Malignancies

And because the above is a list of medical uses of the Bone Resorption urine test, i.e., related to the disease stage, for Clinical Nutrition assessment, I use this urine test for the initial assessment and monitoring of:

- Rebuilding or regrowth of new bone.
- Bone metabolism
- Bone health maintenance.
- Prevention of bone diseases.

Using the Bone Resorption urine test for the clinical nutrition purposes above can eliminate the need to use it for the above medical purposes.



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## CREATININE

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The second test that is part of your Bone Resorption Urine Test, is testing Creatinine.

Creatinine is the end product of creatine metabolism. Creatine is present primarily in muscle and the amount of creatinine produced is related to total skeletal muscle mass.

Skeletal muscles comprise 30 to 40% of your total body mass. They are the muscles that connect to your bones and allow you to perform a wide range of movements and functions. Skeletal muscles are voluntary, meaning you control how and when they work. In time, what affects the muscles will affect your bones, and vice versa, which is one of the reasons Creatinine is tested with NTx.

Daily Creatinine production is fairly constant except when there is massive injury to a muscle. The kidneys excrete creatinine very efficiently. Blood levels and daily urinary excretion of Creatinine fluctuate very little in healthy people.

Therefore, it is important to monitor and provide the nutrients your body requires to bring Creatinine back into optimal range, when your Bone Resorption urine test for Creatinine is out of range.



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## YOUR BONE RESORPTION TEST RESULTS

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### Homeostasis Reference Ranges That Indicate Bone Health!

Referring to the article, posted on our website titled, *“Biochemical Dynamics in the Development of Degenerative Disease”* that I introduced you to at your first consultation with me, if time allowed, you may recall that the human body is asymptomatic when in Phase 1 of Stage 2 (Nutritional Deficiencies/Excesses and Toxicity). And that symptoms begin to appear when in Phase 2 of Stage 2 and increase in intensity and frequency as you progress through each consecutive stage from 2 to 5.

It is important to know that symptoms do not appear only when you are in the Disease Stage (Stage 5), they can appear in any Stage (Stage 2, 3, 4 or the Disease Stage 5) as your biochemistry progresses in the development of degenerative diseases.

In other words, symptoms feel the same in all stages of development OR they may become more intense and/or frequent the longer you stay in or progress through Stage 2, 3, 4 to Stage 5.

Therefore, the only way to know if you are truly healthy is through testing your biochemistry, and that includes whether you have healthy bone or not.

In respect to bone health, this means testing your urine for NTx and Creatinine.

For more information about symptoms, read the following brief articles on The **Villager Publications** webpage, attached to the **Articles by Dr. Smith** webpage:

1. Symptoms are the Messenger, Not the Disease (Part 1 to 4).
2. Symptoms are Not Reliable Sources for Choosing Vitamins (Part 1 to 2).

Therefore, the healthy function (or Homeostasis) of your bone is identified by test results that are within the following range for Homeostasis:

1. NTx: 48 – 53 nmol BCE/mmol c
2. Creatinine: 157 – 192 mg/dL

Test results in the above ranges indicate you currently have strong, healthy bones, if this is your first Bone Resorption urine test, OR you have now restored your bone health as well as reversed any previous disease process.



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However, to accomplish the above, if your test results are outside of the above ranges for Homeostasis, the following must be considered:

1. If your Bone Resorption urine test results are outside the Homeostasis range, a Tissue Mineral Hair Analysis is required to identify the minerals you need to build new bone,
2. Along with a Clinical Nutrition Analysis of your blood chemistry to determine if your elimination system, especially, the liver, kidneys and intestines are in optimal function or congested and dysfunctional.
3. If they are not in optimal function, then your urine test will only be showing the amount of broken bone fiber your body was currently able to detoxify, i.e., showing you less than the total load of broken bone fiber that you may truly have. And in this case, the bone fiber that has remained in your body will embed itself into some tissue, decay (rot) and become another source of inflammation (pain) in due time.

Therefore, if these two tests (hair and blood) have not been ordered, along with your Bone Resorption Urine, we will want to order them now.

### Laboratory Notes:

The following additional notes may appear on your Bone Resorption Urine Laboratory Report:

Adult Female Reference Range for Collagen Cross-Linked N-Telopeptide (NTx), Random Urine may be included on your Lab Report:

Premenopausal: 4-64 nM BCE/mM creat

Though the above may be true for some clients, the fact is, the test results for a woman, who is already in menopause, may also be within the Lab's premenopausal range above, and if that is the case, a woman cannot be premenopausal and menopausal at the same time. So, this reference range is not exclusive to premenopausal women and therefore, I would suggest that my female clients not rely on a Bone Resorption urine test to determine if they are in a premenopausal state.

Instead, a saliva hormone test would be required to determine a women's premenopausal state, and if the saliva hormone test results indicated pre-menopause, then I would agree that the above premenopausal range on their Bone Resorption Urine test has merit.



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### Laboratory Reference Ranges That Indicate Bone Disease!

As your NTx and Creatinine test results move further and further out of the above ranges for Homeostasis (True Health), due to long-term bone nutrient deficiencies/excesses and toxicity (Stage 2), bone metabolic imbalances (Stage 3) and bone dysfunction (Stage 4), in time, bone dysfunction (Stage 4) progresses to bone disease (Stage 5).

It is in Stage 5, the Disease stage, that your physician will be able to diagnose bone disease. In Stages 2, 3, 4, your physician may think that there is nothing wrong with your bones, even when your symptoms are severe. Why? because your test results are still within the Laboratory's reference ranges.

In other words, when your physician can see that your test results are outside the Laboratory Reference Ranges (see below), they are able to diagnosis bone disease, but not when you are within the Lab's ranges.

When within the Lab's ranges, your physician may inform you that your bones are healthy, normal or just fine. Be sure to put the word "medical" in front of these words. For example, medically-healthy, medically normal, or medically fine. All of these terms actually mean you do not have a bone disease or your NTx or Creatinine levels are not life-threatening. They do not mean your bones are healthy. Healthy bones have test results that are within the Homeostasis range.

Therefore, for you to be Disease Free, and/or Free of any Life-Threatening state in relationship to your Bones, your test results must be within the following Laboratory reference ranges for:

1. NTx: 9 – 60 nmol BCE/mmol c
2. Creatinine: 20 – 370 mg/dL

#### **Laboratory Notes:**

The following additional note may also appear under the Lab's "Premenopausal range" mentioned above:

"Results are primarily used for monitoring the response to therapy. A value within the premenopausal reference range does not rule out osteoporosis nor the need for therapy.

The first sentence in the above quote should be obvious no matter what type of doctor has ordered this test.



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However, the second sentence, does not make much sense to me. Why? because with the premenopausal range of 4-64 within the Laboratory's NTx reference range: 9 – 60 nmol BCE/mmol c and keeping in mind that the purpose for the Laboratory's reference range is to assist physicians in diagnosing disease states, it seems to me that the Lab is moving outside the scope of their scientific field when they put a catch-all phrase like this second sentence above on their report. This is like saying,

1. No matter what your test results are, you could still be diagnosed with a bone disease, like osteoporosis. In other words, whether your test results are within the Lab's range of 9-60 nmol BCE/mmol c, or not, and the premenopausal range clearly is, you may still be diagnosed with a bone disease.
2. You may be prescribed a pharmaceutical drug, even though your test results are not outside the Lab Reference Range, which until reading this second sentence on any Laboratory Report, has always been the criteria for a physician's diagnosis and treatment. In other words, traditionally, the medical criteria is that the patient's test results must lie outside the Laboratory's reference range to warrant prescribing medication. Otherwise, what scientific proof does the patient have that their physician's diagnosis and treatment is warranted.

These are very unsettling thoughts, to me, because it appears the Laboratory is giving a physician carte blanche to prescribe a medication without a clear indication that the patient is in a disease state. So, the patient's beware.



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## BONE HEALTH MAINTENANCE & TREATMENT

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- If your bone health concerns are biochemistry-related only, then Clinical Nutrition Testing and Therapy is what you need to restore and maintain healthy body and prevent bone diseases and disorders.
- If your bone health concerns are due to an inherent or acquired weakness and/or a structural injury or you have had surgery, then you require both Clinical Nutrition Testing and Therapy, along with Physical Therapy and/or Chiropractic.
  - An inherent weakness is a birth defect.
  - An acquired weakness is like damage that occurred due to an accidental injury after birth or from having a surgical procedure performed, whether the surgery was considered successful or not.

Any time the tissue of the human body is cut into or opened due to injury, or a bone is broken; your body requires therapeutic concentrated nutrients to assist in its complete healing.

Physicians and the general public believe they are healed once they have been considered “medically recovered” after discharge from the hospital or clinic, or the cast has been removed. As in the case of a broken bone, once the patient is able to, for example, walk on that leg or use that arm, wrist or hand again without pain.

However, this is rarely true. We know this because many older, former athletes (amateur or professional) have said they can tell when the weather changes by the pain that occurs in the area of an injury or surgical procedure they had in their youth.

If they had completely healed, they would not have pain in these areas later in life.



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## DEATH FOLLOWS HIP FRACTURE

According to the Mayo Clinic, “men are more likely than women to die after having a hip fracture. One in three men die within a year of sustaining a hip fracture. Hip fractures are killers.”

However, according to the late Dick Versendaal, D.C, Ph.D. (Ph.D. in Clinical Nutrition), who was one of my most treasured mentors, death within five years after a hip fracture for both men and women is possible due to its adverse effects on the heart.

This always makes me think of that child’s song, “Dem Bones,” which starts with “the toe bones connected to the foot bones” and works its way up to “the thigh bone’s connected to the hip bone, etc.” LOL

Well, the fact is every part of the human body has a direct or indirect connection to every other body part and the hip has a direct effect on the heart. So, when you “shake dem bones about” you are exercising the heart too. Everyone knows when you exercise your muscles and bones, which includes the hip, through walking, running, swimming or on a trampoline, you are exercising the heart too, and consequently, when you injure the hip, specifically, it can injure the heart, too, even fatally.

**Now, having stated the above facts, I would like for you to consider the following:**

If Dr. Versendaal was alive today, I would ask him whether his information is based on:

1. A public survey of people who have died five years after a hip fracture,
2. A survey of relatives of his patients who have died five years after a hip fracture, who did not receive Clinical Nutrition Therapy or
3. Clinical observations of his own patients, who received Clinical Nutrition Therapy after the hip fracture, but too late to restore the fracture to prevent death, and
4. Did any of his patients who received timely Clinical Nutrition Therapy after a hip fracture, not die in five years?

Because though I do not have the statistics or other details on Dr. Versendaal’s statement above at my fingertips at the time of this writing, I have remembered these words from the moment I heard him say them at one of the Clinical Nutrition training courses I attended of his in the 1990’s.



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And, since then, from my own clinical experience in providing timely Clinical Nutrition Therapy for my clients to have the nutrients their body needs to heal a fracture, in any part of the body, I would have to say that though statistics have recorded death from 1-5 years after hip fracture, that does not have to be the case for those who:

1. Receive timely Clinical Nutrition Therapy and/or
2. Let's not forget about the power of prayer.



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## OSTEOPOROSIS IN MEN AND WOMEN

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### Mayo Clinic Osteoporosis Statistics

According to the Mayo Clinic, men are at lower risk for osteoporosis than women, however, the fact is, men, sustain nearly 30% of the 2 million fractures that happen in adults over the age of 50 each year in the U.S.

Age, steroids, emphysema or Chronic Obstructive Pulmonary Disease (COPD), smoking, alcohol, and low testosterone are major risk factors for low bone density and fractures in men.

In my opinion, the above factors apply to women also, though overall female hormone imbalances of estrogens and progesterone play a role in bone health, which includes levels of testosterone, as well.

An essential factor in Bone Health, i.e., the prevention of osteoporosis and other related bone diseases, is to be tested for the vitamins, minerals and other nutrients required to build and maintain strong, healthy bone.

Doing this for my clients, as I mentioned above, we have been able to help our clients bring their abnormal Bone Resorption Test values into balance as early as six months. So, yes, building new healthy bone is possible.

### Medical Treatment for Osteoporosis

If I were you, I would seriously investigate the purpose and side effects of bone-related pharmaceutical drugs. If the information on their purpose is even available, other than typical medical literature, such as the typical medical literature below on Fosamax.

Medical literature on Fosamax says that it is prescribed for the treatment and prevention of osteoporosis, and the treatment of Paget's disease of the bone.

However, according to the research and clinical experience of Jane Lang, D.C., Fosamax makes the body stop making bone, so instead, you get "dense" old, brittle bone. In other words, Fosamax is able to help your bones become dense, as advertised, but what good is dense bone, if it is old and brittle bone?

Therefore, it is not uncommon to think that there are other underlying consequences from taking any bone-related drug. **So, Buyer Beware!**



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## CLINICAL NUTRITION & BONE HEALTH

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### *CLINICAL NUTRITION A SAFE AND EFFECTIVE APPROACH TO BONE HEALTH & DISEASE PREVENTION*

As mentioned, retesting our client's Resorption Urine Tests have proven that our therapeutics supplements have provide the nutrients the bone needs to grow new bone and build bone strength as early as six months. In other words, when the client's initial Bone Resorption Urine Test results were out of range for optimal bone health, their six-month retesting indicated they were now in optimal range.

However, the amount of time it requires does vary per the individual.

To improve your bone health requires:

1. A Clinical Nutrition Analysis of your Bone Resorption Urine Test to first identify the need for improving your bone health and then for those who have abnormal test values, retesting the Bone Resorption urine test helps us monitoring your improvement until you attain optimal test values.
2. A Tissue Mineral Hair Analysis (TMA, also referred to as TMHA) to identify the minerals that your body requires to grow new healthy bone, and periodical retesting then to maintain optimal levels for bone health maintenance, once achieved. The TMA also identifies heavy metal toxicity which adversely affects bone health, and in time, requires heavy metal detoxification once you have reached mineral sufficiency.
3. A comprehensive Blood Chemistry testing that identifies vitamins required for bone health and to evaluate your liver and kidney function, along with other elimination pathways.

Why evaluate liver and kidney function? Because if your liver and kidneys, for examples, are toxic, congested and dysfunctional, they will not be able to remove (detox) the toxins (germs, infectious tissue, chemicals, metals, etc.) that are adversely affecting the surface and/or the inside of the bones. Nor will they be able to remove the bone fiber particles that are not being able to get out of your body through your urine.

In other words, in building a new home, you must first remove the debris from the land, and/or the old wood and glass from the previous home, in order to clear the way to build



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the new home. The same principle applies to building new bone, or restoring any part of the body, for that matter.

Additionally, just because your urine test shows that your collagen cross-link fibers are breaking down and being removed through your urine, does not necessarily mean “all” of these broken fibers are getting out of the body if your liver and kidneys are dysfunctional.

If any remain in your body because your liver, kidneys and other elimination pathways are unable to remove them, they may then become the source of inflammatory substances, which means another underlying source of pain for you.



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Collagen Cross-Linked N-Telopeptide (NTx) & Creatinine

By Dr. Donna F. Smith

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## ABOUT BONE DENSITY

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### What is Bone Density?

Bone density, or bone mineral density, is the amount of bone mineral in bone tissue. The concept is of mass of mineral per volume of bone. Although, clinically, it is measured by “proxy” according to optical density per square centimeter of bone surface upon imaging.

By proxy means, by substitution, so actual bone mineral in body tissue is not being tested.

### What is a Bone Density Test?

A Bone Density test attempts to measure bone mineral density using spectral imaging. Two X-ray beams, with different energy levels, are aimed at the patient's bones. When soft tissue absorption is subtracted out, the bone mineral density is determined from the absorption of each beam by bone.

This test may include image of the hip, the L4 vertebrae, and the wrist, evaluating both trabecular (spongy) and cortical (rigid) bone.

***It is very important to understand that the DEXA scan measures Bone density NOT Bone quality!***

To diagnose bone diseases, physicians have traditionally used the Bone Density Test; a Dual Energy X-ray Absorptiometry, also referred to as the DEXA or DXA Scan. However, a DEXA Scan is measuring bone density NOT bone quality. Bone Resorption urine tests both.

In reviewing DEXA scan reports submitted by my clients over the past years, along with the results of their Bone Resorption urine lab report, I have observed clients who had “unfavorable” DEXA scan results and yet their Bone Resorption urine lab reports were “favorable,” i.e., within “normal” range.

**From this, I conclude the porous bone observed from a DEXA scan may be caused by toxins that align and adversely affect the surface of the bone, thus making it porous and less dense; however, the toxins have not reached the cross-linked fiber within to compromise the strength and quality of the entire bone itself. Remember, the Bone Resorption urine test measures whether the cross-link fibers within the bone, which makes it strong, are still intact, or breaking down.**

Porous bone is like the small holes you see, here and there, along the surface of Swiss Cheese.



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Toxins, such as chemicals, metals, infectious tissues, decaying or dead cells, germs, worms, etc., on the surface of the bone, can destroy the surface of the bone. However, whether these toxins have gone deeper into the bone to compromise the integrity of your cross-linked bone fiber is determined by the Collagen Cross-Linked N-Telopeptide (NTx) urine test.

**So, you can still have healthy bones even when the DEXA Scan shows otherwise.**

Thus, the benefit of Clinical Nutrition Therapy for bone health is that our therapeutic supplements provide the nutrients your body requires to:

1. Remove these toxins from the surface of the bone, so they no longer assault the bone's surface,
2. Assist the body in growing new bone tissue to repair the bone's surface, as well as,
3. Restore its collagen cross-links, in the event that your NTx urine test results were also not within an optimal health range.

## Bone Density Scores – What Do They Mean?

1. The T-Score is a numerical comparison to the average bone density found at “peak bone mass.” In other words, the peak bone mass of a 30-year-old.
2. The Z-Score is a numerical comparison to the average bone density of an age-matched subject. In other words, matching your age.
3. Both of the above scores are measured on a bell curve using standard deviations from normal.
4. A negative score indicates lower bone density.
5. A positive score indicates greater bone density.
6. A “0” score indicates a bone density the same as the value you are being compared with.

## How Do I Evaluate My Bone Density Score?

If you have had a DEXA scan, the following will help you understand your test result score, unless you are a small, petite woman (see next section):



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- Normal is T-score between -1.0 and +1 or above.
- Osteopenia (or low bone mass) is T-score between -1.0 and -2.5.
- Osteoporosis is T-score -2.5 and below.
- Severe Osteoporosis is T-score -2.5 and below, with a history of a fracture.
- Significant risk of fracture is a Z-score below -2.

If results are in the osteoporosis category, further evaluation should be done to look for any other contributing causes to low bone mass.

### Small, Petite Woman Score Lower or Fail the DEXA Scan

Women who are petite will often have lower scores. In fact, according to Janet Lang, D.C., small women have a tendency to fail this test. Thus, for small women, the Bone Density Test is not a useful test.

So, though the Bone Resorption urine test is the ideal test for everyone, for all the reasons I have shared in this article, the Bone Resorption urine test has finally provided the small, petite woman, a safe and effective test to monitor their bone health, that was not available before.

### What To Do If You Choose To Have a Bone Density Test!

Hopefully, after reading this document, you will come to the same conclusion that I and other clients before you have and that is the Bone Resorption Urine test is a safer, non-invasive, reproducible, radiation-free and effective evaluation of overall bone health.

However, if you chose to have a Bone Density Test, whatever your reason, please protect yourself by ordering our homeopathic for radiation detoxification. Dosage, frequency and the number of bottles required for your individual needs will be provided at the time of purchase.

You may require more, however, so far, our clients, who have any radioactive or x-ray testing for any reason, be it for Bone Density, Dental x-rays, and so on., have required a minimum of nine (9) bottles for radiation detoxification. That in itself, speaks loud and clear to me, the importance of avoiding radiation exposure as often as possible.

And avoiding radiation exposure is possible regarding testing and monitoring bone health, through the Bone Resorption Urine Test.



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You may also contact me for our homeopathic to detox radiation from your body considering the amount already in your system from all other sources of radiation, including past Bone Density Testing, if that also applies to you. Then repeat this annually to remove the radiation you have accumulated since your last radiation detox is ideal to help prevent radiation-related health conditions and disease. The number of bottles you need will vary from year to year.

## CONCLUSION

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Hopefully, you are now better informed about your options both medically and through Clinical Nutrition regarding bone health and bone disease, so you can make decisions that work for you, rather than against you.



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## ABOUT DR. SMITH

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**Dr. Donna Smith** has a Ph.D. in Clinical Nutrition, is a Doctor of Naturopathy (N.D.), a Board Certified Clinical Nutritionist (C.C.N.), Certified Dietitian-Nutritionist (C.D.N.), and a Canadian Chartered Herbalist (C.H.).

Dr. Smith is also a Free Lance Nutritional Health Writer and has written over 100 articles for Internet and traditional magazines and newspapers, such as **The Villager**, a South Denver, Colorado, publication and the **American Chiropractic Magazine, the largest chiropractic magazine in the United States**. You may also request a list of her best-selling e-books on a variety of topics.

Public speaking engagement include NBC and ABC local networks, and clubs, hospitals, universities, corporations and scientific conferences, on a variety of nutrition and health-related topics, such as, the national groups of scientists and biochemists at the **American Society of Clinical Laboratory Science (ASCLS), International and American Associations of Clinical Nutritionists (IAACN), Stephen F. Austin University, Midwestern State University**, Optimist Clubs, Toastmasters, Business and Professional Women's Club, Women Entrepreneurs, Worksite Wellness, American Heart Association, Parkinson's Group, and St Gobain Corporation, to name a few.

Dr. Smith owns **Advanced Clinical Nutrition (est. 1981)** in Wichita Falls, Texas, where she provides a **Clinical Nutrition Analysis or Interpretation of Laboratory Tests (blood, urine, saliva, stool, and hair)** to identify Clinical and Sub-Clinical Nutritional Deficiencies and Excesses, Toxicity, Biochemical Imbalances, and Organ, Gland and Body System Dysfunctions, which are the stages the body progresses through first in the development of degenerative diseases. Correcting each of these preliminary stages is the key to reversing the disease process, restoring health, and preventing future diseases.

From her Clinical Nutrition Analysis findings of these scientific Laboratory Reports, Dr. Smith designs and dispenses therapeutic, whole food supplements, available through nutritional health care providers, and provides a Therapeutic Dietary Plan, which is a list of foods selected for their specific food chemistry effect on the individual's biochemistry as identified in their test results.

Dr. Smith's Clinical Nutrition Services are also provided to **Healthcare and Fitness Providers**, who want to offer clinical nutrition services to their patients/clients, yet do not have the time or training to do so.

**Clinical Nutrition Testing, Therapy, and Personalized Dietary and Lifestyle Education Services** are provided by mail, e-mail, and telephone consultations. A.C.N. clients save money as there are no gas expenses to/from appointments, money required for babysitters, time away from home and/or



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having to be away from the workplace to receive nutritional services. Lab Kits are mailed to the clients' homes, where they collect their specimen samples and then mail them directly to our Labs.

Dr. Smith has successfully assisted every client who has contacted her in how to improve their health, no matter what their health challenge, such as; but not limited to, increasing energy, balancing hormones, improving mental and emotional function, strengthening the nervous system, muscles, joints, and immune system, restoring over-all organ/gland and body system function (including the hair system to restore its grow hair and in some cases even restoring natural color), managing weight, preventing/reversing disease processes and enhancing life and/or sports performance.

Dr. Smith's clientele resides in 37 U.S. States and seven international countries.

**For more information, to order** a Clinical Nutrition Analysis of the Laboratory Reports from testing your biochemistry (blood, urine, hair, saliva and stool), including genetic testing, Bone Resorption and Telomere Length Testing, and to contact Dr. Smith, call (940) 761-4045.

Meanwhile, please browse her website at [www.AdvancedClinicalNutrition.com](http://www.AdvancedClinicalNutrition.com) and while there subscribe to Dr. Smith's FREE Newsletter and read Free Articles by Dr. Smith. You may also connect and/or follow her on [www.linkedin.com/in/drdonnafsmith](http://www.linkedin.com/in/drdonnafsmith) and [www.Facebook.com/DonnaFSmithPhD](http://www.Facebook.com/DonnaFSmithPhD). Though she is more active on LinkedIn; than on other social media formats.