



# OSTEOPOROSIS NEWSLETTER

Neon K Ringwood, MS  
Editor

Volume 6, Issue 2  
April 2008

| Inside this issue: |   |
|--------------------|---|
| Gardening          | 2 |
| New Guidelines     | 3 |
| Oakwood Map        | 4 |
| Bone Quality       | 5 |
| Recipe File        | 6 |

## May is Osteoporosis Awareness and Prevention Month.

The theme for 2008 is "Osteoporosis: It's Beatable. It's Treatable." The National Osteoporosis Foundation developed a Bone Tool Kit and Public Service Announcement (PSA) campaign. Each of us can help others become aware of osteoporosis and prevention. The theme was "Osteoporosis: It's Beatable. It's Treatable."

## B.O.N.E.S. Support Group Schedule

Tuesday April 8 - "Adaptions for Daily Living with Osteoporosis"  
Mindy Wiseman Occupational Therapist at Care Wisconsin (See page 3.)

Tuesday May 13 - "Osteoporosis and Osteoarthritis - What Can Help?"  
Barbara Luedke, Senior Physical Therapist in Rehabilitation and Neurology

Tuesday June 10 - "Nutrition for Healthy Bones Muscle Strength and Coordination"  
Karyn Moehring, UW Health registered dietician and clinical nutrition

Tuesday July 8 - Dr. Neil Binkley will present his annual report to the B.O.N.E.S. group on recent research advances in the field of osteoporosis treatment and prevention.

Tuesday August 12 - "Coping with Osteoporosis Issues" A panel discussion led by Sheree Drezner, Social Worker.

Tuesday September 9 - "Interactions of Commonly Prescribed Drugs and Osteoporosis Drugs - What to Watch for"  
Sean Gehrke, Pharmacist at UW Health

**B.O.N.E.S.  
SUPPORT  
GROUP  
will meet on  
April 8th  
Oakwood  
Auditorium  
6209 Mineral  
Point Road  
Madison**

**1:30-2:30 p.m.**

**Questions? Call  
265-6410  
for information.**

# P.T. Place: Gardening with Osteoporosis

By Barbara Luedke, Senior PT

Summers in Wisconsin. For many of us that means a limited number of months to enjoy a variety of outdoor activities, and gardening is frequently at the top of the list. Individuals with osteoporosis often ask if gardening is an acceptable activity. The answer is yes, as long as principles of safe movement are followed. The two most important precautions are to avoid forward bending and twisting movements. Each of these motions produces high loads on the vertebral bodies, especially when lifting or carrying an object. A combination of these two motions creates even higher compressive loads on the vertebral bodies. Therefore, always maintain good postural alignment and use good back protective measures. With gardening, you reap positive benefits. One is the pride and satisfaction of watching your gardens bloom and grow. Another benefit is the improvement in your bone strength and general endurance.

Safe gardening principles include:

1. Consider the option of container gardening or raised beds.
2. Use long handled tools to avoid forward bending.
3. Bend from your knees to reach for an object on the ground.
4. Better yet, position yourself on the ground, perhaps on your hands and knees or in a side-sitting position. This is a good opportunity to provide weight-bearing activities through your arms and upper body!
5. If balance or the ability to move safely from the ground to standing is an issue, consider using a stool or a kneeler with hand supports. Just remember to keep your back straight, bending from your hips as reach.
6. Always use good body mechanics when shoveling, hoeing and raking, etc. Do not bend forward or twist. Instead, stand with your feet apart, and one foot slightly ahead of the other. Then shift your weight from foot to foot in a rocking motion. Remember to keep your

back straight. Do not perform these activities if you experience pain or discomfort.

7. When carrying an object, hold it close to your body. If you are carrying items in a bucket, it is better to evenly divide the load between two buckets and carry one in each hand.



Enjoy your summer activities. Always remember to move safely. Do, but don't overdo . . . a difficult concept for persons with a strong work ethic. Stop before you become tired so you do not place your muscles or bones at risk for injury. And most of all enjoy the bounty of your efforts – All the beautiful flowers and healthy veggies.

## Gardening and Yard Work = Good Exercise

From <http://www.healthatoz.com>

Researchers at the University of Arkansas-Fayetteville found that gardening and yard work qualify as weight-bearing exercise,

which is important for bone strength. Since so many people enjoy these activities, they are more likely to engage in them. Further, many people do not think of gardening

or yard work as exercise but rather as a form of leisure activity that is pleasurable and rewarded by blooming plants, a beautiful yard or vegetables for the table.

# NOF Releases Updated Clinician's Guide 3

On February 21, the National Osteoporosis Foundation (NOF) released their updated "Clinician's Guide to Prevention and Treatment of Osteoporosis." This update includes the long-awaited World Health Organization approach that allows estimation of 10-year risk for osteoporotic fracture. Very briefly, this approach incorporates clinical risk factors (such as family history of osteoporosis and prior fracture) with bone density measurement to allow estimation of an individual's long-term likelihood of sustaining a fracture. Such an approach will help clarify which individuals should receive medical therapy to reduce fracture risk. This represents a major advance in the way healthcare providers evaluate and treat people with low bone mass or osteoporosis and the risk of fractures. Expect the gradual implementation of these recommendations in the U.S. over the coming months.

The new Clinician's Guide applies the recently released algorithm on absolute fracture risk called FRAX® by the World Health Organization (WHO).

FRAX® is also referred to as a 10-year fracture risk model and 10-year fracture probability. This algorithm estimates the likelihood of a person to break a bone due to low bone mass or osteoporosis over a period of 10 years.

The 10-year fracture risk approach provides a markedly improved method to assure that people at high fracture risk get treated. Those at highest risk include postmenopausal women and older men with a diagnosis of osteoporosis, based on a BMD test T-score of -2.5 or lower, or those with a clinical diagnosis based on having sustained a hip or spine fracture. In addition, absolute fracture risk calculations help to resolve many of the questions about management for people with low bone mass, also called osteopenia. These are people with a T-score between -1.0 and -2.5 on their bone mineral density (BMD) test.

The new WHO approach takes into account not only BMD at the hip but also nine specific clinical risk factors for osteoporosis and related fractures. NOF has adapted this algorithm for the

U.S. and incorporates not only fracture outcome and mortality data from U.S. women and men, but also cost effectiveness analysis to determine when it is cost effective to treat a person with an osteoporosis medication to prevent a fracture.

In the near future, some central DXA (dual-energy x-ray absorptiometry) machines that test the bone mineral density of the hip and spine should be able to provide a report that gives information on a person's 10-year fracture likelihood by incorporating the NOF application of the WHO algorithm into the bone density machine's computer. Alternatively, clinicians can also enter a patient's BMD hip T-score and other risk factor information in a simple web-based version of the algorithm in the doctor's office to obtain 10-year fracture probably in seconds. The information about future long-term fracture risk will help both healthcare providers and patients decide whether treatment with an osteoporosis medication is needed.

Source: NOF.ORG

## Next B.O.N.E.S. Support Group Meeting

Adaptations for Daily Living with Osteoporosis is the topic of our monthly B.O.N.E.S. meeting on April 8. Our speaker will be Mindy

Wiseman who is an occupational therapist at Care Wisconsin. Care Wisconsin is a nationally recognized leader in health care

management and innovative high-touch care for older adults with severe and disabling chronic conditions.

"Whether you think you can or think you can't. . . either way, you're right."  
Henry Ford



# Oakwood Village West

6201-6225 Mineral Point Road

Madison, WI 53705

(608) 230-4699 • www.oakwoodvillage.net

**★** Main Visitor Entrance

**2** Loading Dock #2

Bus Stop

**V** Visitor Entrance

**†** Resurrection Chapel

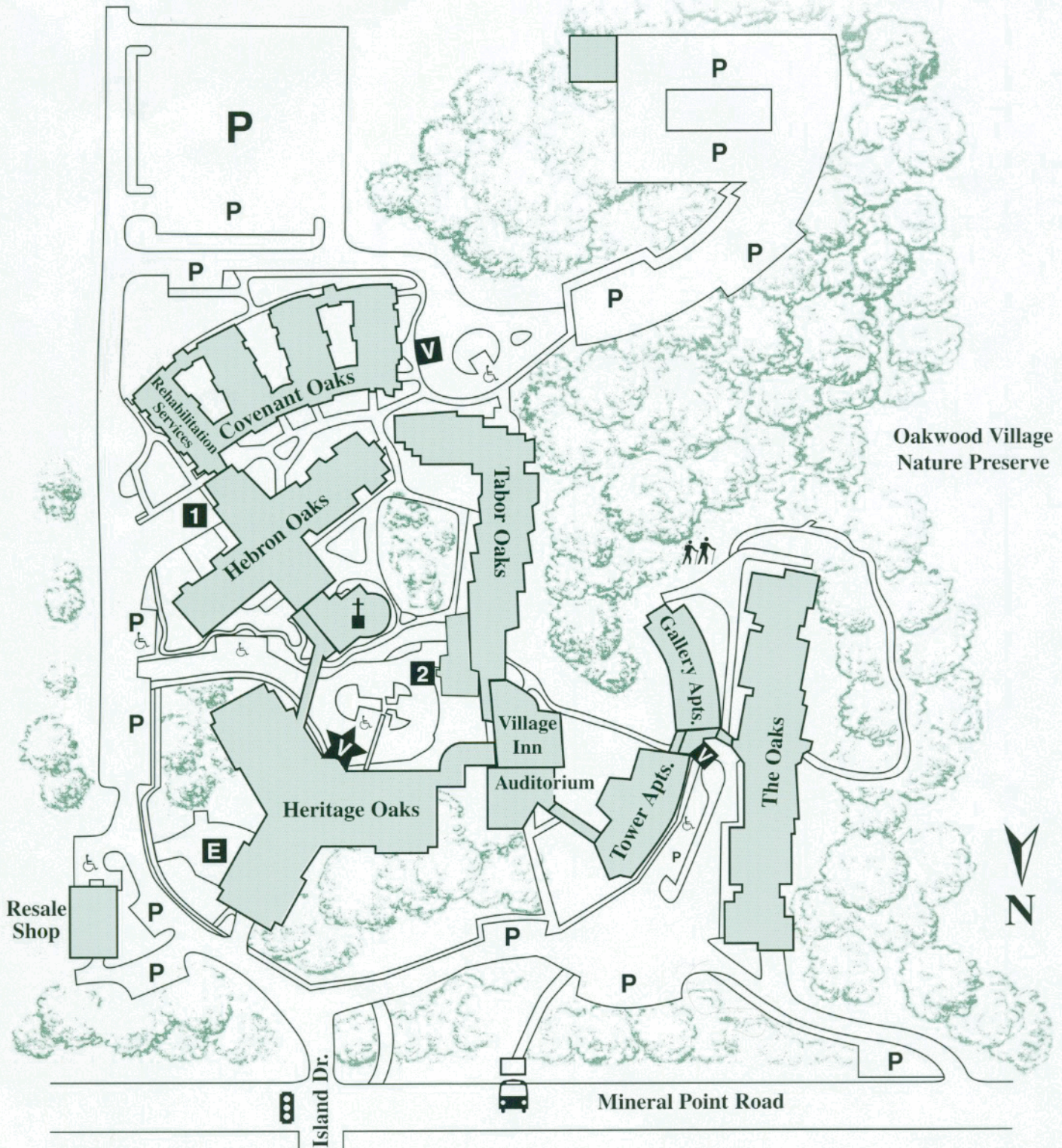
**P** Parking

Handicap Parking

**1** Loading Dock #1

**E** Entrance to Underground Visitor Parking

Public Entrance to Nature Preserve



# Bone Quality

Robert Blank, MD

While we commonly speak of osteoporosis and osteopenia, the truest measure of skeletal health is the occurrence of fractures. Because of the greater ease of measuring and monitoring bone mineral density (BMD) than fracture, it is easy to forget that there are factors other than bone density that affect fracture susceptibility.

Several lines of evidence demonstrate this fact. First, large, carefully conducted and analyzed population studies have demonstrated that, after correcting BMD past fracture, older age, and higher bone remodeling rates each increase fracture risk. Second, clinical trials of osteoporosis drugs have shown reduction in fracture risk in patients receiving drug rather than placebo, even if BMD did not increase. Third, there are diseases in which bone mass is increased, but bone strength is decreased. Fourth, there are drugs that increase BMD without reducing fracture risk. These observations indicate the existence of one or more factors that are not measured by densitometry that have an impact on bone strength. Because we are not yet certain what these factors are, or how they can best be measured, they are commonly lumped together into the concept of “bone quality”.

In fact, bone quality can be broken down into several distinct characteristics, each of which is the subject of intensive investigation. That there is no single explanation for bone strength reflects the complexity of bone tissue and our bodies’ responses to the mechanical loading that we experience in the course of daily living. In the next few paragraphs, I summarize some of the contributors to bone quality.

**1. trabecular architecture:** Some bones have struts and plates called

trabeculae running through them. Different skeletal sites contain different amounts of trabecular bone. Trabecular bone is abundant in the vertebrae and the heel, rare in the shafts of long bones, and present in moderate amounts at the hip. The spacing, orientation, and number of connections among the trabecular plates and struts play a crucial role in determining the ability of the whole bone to tolerate loading. The mechanisms of bone remodeling permit deposition of new bone over preexisting bone, but not creation of whole new trabeculae from space occupied by marrow.

**2. bone protein chemistry:** Bone tissue contains protein in addition to mineral. Reinforced concrete is a common material with important similarities to bone. The protein in bone is like the steel rebar in reinforced concrete, providing flexibility and tensile strength. Bone mineral is like the cement in reinforced concrete, providing compressive strength and stiffness. Just as rusted rebar will weaken a reinforced concrete structure, damaged protein will result in structurally weak bone. Some elements of bone protein chemistry have been shown to correlate with tissue strength, in particular the nature of the chemical bonds that link individual protein molecules to each other.

**3. bone mineral crystal size:** Just as differences in the chemical nature of the bone protein alter strength, differences in the chemical nature of the bone mineral also contribute to strength. The principal mineral in bone is a calcium phosphate compound named apatite, but apatite also contains measurable amounts of other ions including sodium, potassium, magnesium, carbonate, hydroxyl, chloride and sulfate. The amounts of these contaminants alter the crystal structure of the mineral, with cascading effects on the size of

individual crystals, their packing into the bone matrix, and ultimately the inherent strength of the mineral.

**4. accumulated damage:** Roughly 10% of the skeleton is being remodeled at any given time, with resorption of old bone tissue and its replacement by new tissue. Because the fraction of bone being remodeled is small and since remodeling is not uniformly distributed over the skeleton, some sites contain tissue that is decades old. Over the course of years, both microscopic cracks and chemical damage can accumulate. Whether microscopic cracks grow into fractures remains an open question, but it is established that they exist. Various forms of chemical degradation of bone proteins, in particular those caused by oxidative stress occur in bone and may contribute to increased fracture susceptibility.

There is not yet consensus among the bone research community regarding the relative contributions of each of the features described above on fracture risk, but there is consensus that they play some role in determining bone strength. Moreover, it is possible that additional factors will be discovered as research proceeds. What does this mean to you as a patient? Most importantly, recall that preventing fractures is the goal of your care. Helping you to make your home safer, improving your vision, maximizing your muscle strength, and finding substitutes for medications that make you either sleepy or dizzy are each as important as prescribing medications to increase your BMD. Because good evidence shows that preventing bone loss prevents fracture, consider stable BMD as successful therapy. Finally, because there are bone quality factors, there is the prospect that in the future, novel therapies addressing these bone properties will be developed.

# RECIPE FILE

## Oven Roasted Fish, Mediterranean Style

|  |   |
|--|---|
| 4 portions (about 4 ounces each)<br>salmon, halibut, cod or other fish fillets,<br>preferably skinless | ¼ cup chopped fresh basil   |
| 2 medium (about 4 ounces each)<br>zucchini, trimmed, sliced thin                                       | 1 strip (about ½ inch wide) orange zest<br>(removed with vegetable peeler), cut<br>4 long narrow strips |
| ½ red onion, cut into very thin slivers  | Salt and freshly ground pepper  |
| 2 garlic cloves, minced  | 2 tsp extra virgin olive oil  |
|  | 2 cups cooked instant brown rice  |

Preheat oven to 450 degrees.

Cut four pieces of foil each about 12 inches long. Position a portion of fish in center of each piece of foil. Rub minced garlic onto fish. Sprinkle lemon juice over fish. Divide zucchini, red onion, orange zest and basil evenly on top of fish. Sprinkle with salt and pepper and drizzle with olive oil. Wrap packets double, folding long sides; crimp ends to seal. Place on baking sheet. Bake fish for 15 minutes.

Slide off baking sheet and cut through packets. Slide fish onto bed of rice and top with vegetables and juices.

Makes 4 servings. Per serving: 319 calories, 14 g total fat (3 g saturated fat), 24 g carbohydrates, 23 g protein, 2 g dietary fiber, 64 mg sodium.

Reprinted with permission from the American Institute for Cancer Research.