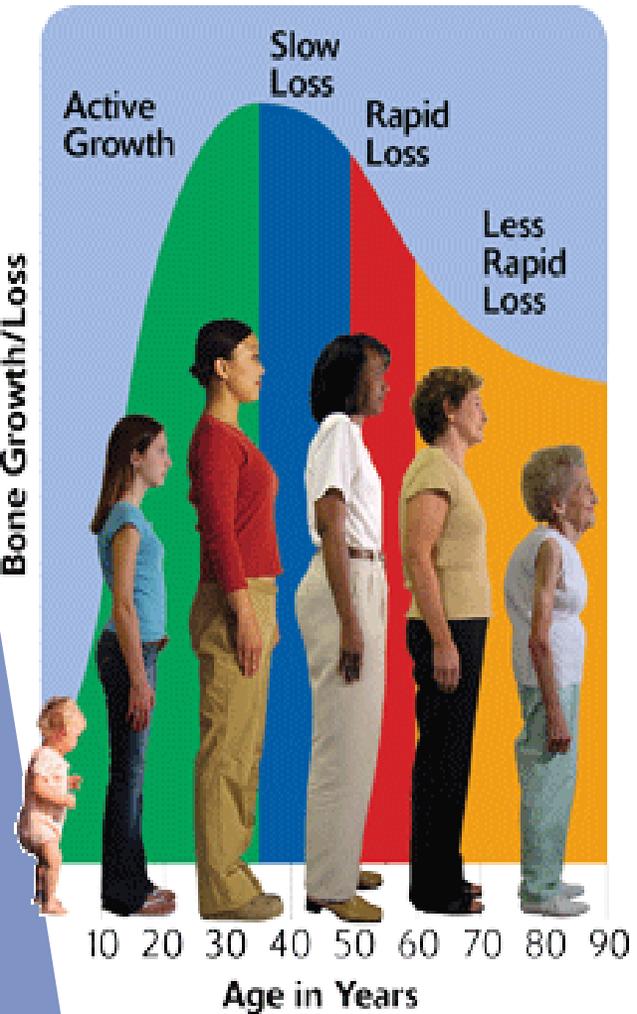


Osteoporosis

Know Your Risk

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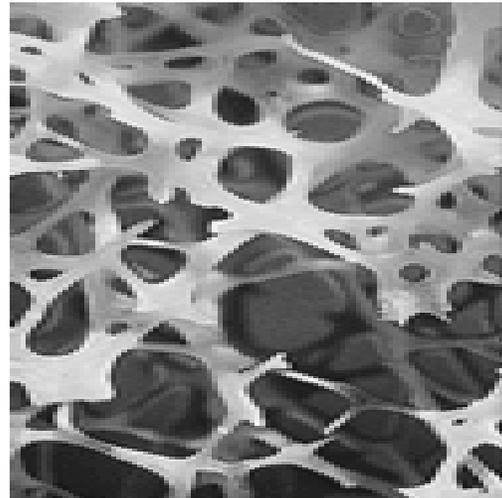
Bone Basics



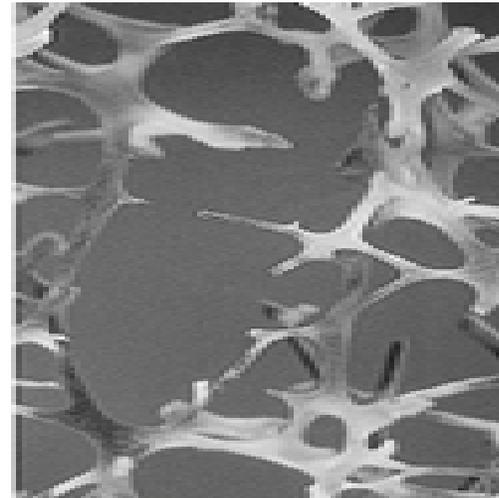
- ▶ Bone is living tissue
- ▶ Bone is constantly changing - modeling or remodeling
- ▶ Children and teenagers form new bone faster than they lose old bone
- ▶ After peak bone mass is achieved, and especially after menopause, remodeling process becomes unbalanced.

Bone Strength - determined by many variables

- ▶ Peak bone density
- ▶ Nutrition
- ▶ Physical Activity
- ▶ Medications that negatively affect bone density



Healthy Bone



Osteoporotic Bone

Osteoporosis - Definition

- ▶ Osteoporosis is a disease characterized by bone weakness resulting in bones that break more easily
- ▶ Osteoporosis = 'porous bone'
- ▶ Bone loss is a natural part of aging but not everyone will lose enough bone density to develop osteoporosis.
- ▶ About 9 million Americans over age 50 years have osteoporosis
- ▶ 1/2 of women and 2 in 5 men will develop osteoporosis during their lifetime
- ▶ Osteoporosis is a SILENT disease. There are no symptoms until fracture occurs
- ▶ Osteoporosis is the cause of approximately 2 million fractures every year

Osteopenia - Definition

- ▶ Low bone density
- ▶ Osteopenia is a risk factor for fracture
- ▶ Some but NOT ALL individuals with Osteopenia have increased risk for fracture and should be treated
- ▶ This is an opportunity to modify your risk factors



Who Gets Osteoporosis?

- ▶ In the US, 53 million people either have osteoporosis or are at high risk due to low bone mass
- ▶ Osteoporosis affects women and men of all races and ethnic groups
- ▶ Risk for osteoporosis is related to multiple factors. Some risks you can change.



Osteoporosis Risk Factors You Cannot Change

- ▶ Female gender/past menopause
- ▶ Family member with osteoporosis/fracture
- ▶ Thin, small, petite body frame
- ▶ Aging (women and men)
- ▶ Other health conditions : rheumatoid arthritis, celiac disease, thyroid disease, inflammatory bowel disease, COPD.
- ▶ History of certain broken bones after age 50 years (hip, wrist, vertebrae)
- ▶ Use of certain medication: steroids, anticonvulsants, antacids (proton pump inhibitors)
- ▶ History of falls over the last year

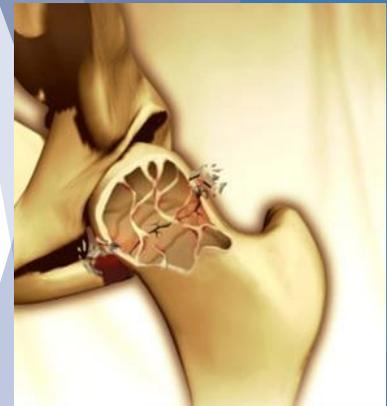
Osteoporosis Risk Factors You May be Able to Change

- ▶ Too little intake of calcium, vitamin D
- ▶ Too little exercise
- ▶ Smoking
- ▶ Alcohol - 3 or more drinks a day
- ▶ Excessive intake of caffeinated beverages



Fractures = Broken Bones

- ▶ There are over 2 million fractures a year in individuals with osteoporosis/osteopenia.
- ▶ These fractures occur with low or no trauma - fall from standing height, simple activities such as coughing, sneezing, opening a window.
- ▶ Wrist fractures are often the earliest osteoporosis related fracture.
- ▶ Spinal vertebral fractures result in pain, deformity of the spine and change in posture. Up to 60 % of vertebral fractures occur with NO symptoms.
- ▶ Hip fractures almost always require hospitalization and surgery. There is a 20 % increased risk of death in the year after a hip fracture.



Osteoporosis Evaluation

- ▶ Assessment of risk factors with complete history and physical exam
- ▶ Bone Density Testing - DXA
- ▶ Guidance in calcium and vitamin D needs
- ▶ Assessment of balance and fall risk
- ▶ Consideration of exercise/balance training RX for fall prevention
- ▶ Medication prescription if indicated
- ▶ Follow up visits to assess tolerance and benefit of treatment



DXA - Dual energy x ray absorptiometry

- ▶ Measures the density of minerals in your bone
- ▶ Painless
- ▶ Takes less than 15 minutes
- ▶ Very low radiation exposure
- ▶ Diagnoses bone loss and osteoporosis
- ▶ Helpful to monitor treatment
- ▶ Can help to predict risk of future fractures



Understanding the BMD Test

- ▶ Your test will compare your bone density to the ideal peak bone density of a healthy 30 year old.
- ▶ The difference between your BMD and that of a healthy adult are measured in standard deviations.
- ▶ This is described as a T score
- ▶ The greater the negative number, the more severe the bone loss.
- ▶ Osteopenia T score -1 to -2.4
- ▶ Osteoporosis T score -2.5 or lower
- ▶ Some individuals fracture with T scores that are in the low range but not osteoporosis

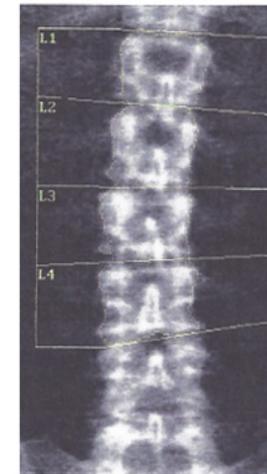


Image not for diagnostic use
Total BMD CV 1.0%

DXA Scan Information:

Example of a DXA scan showing a T score lower than -2.5 indicating osteoporosis

Results Summary:

Total BMD:	0.766 g/cm ²	T score:	-2.6				
Peak reference:	73%	Z score:	-1.1				
Age matched:	86%						
Region	Area [cm ²]	BMC [g]	BMD [g/cm ²]	T score	%PR	Z score	%AM
L1	12.06	7.45	0.617	-2.8	67%	-1.5	79%
L2	13.15	10.12	0.770	-2.3	75%	-0.9	88%
L3	12.71	10.65	0.838	-2.2	77%	-0.7	91%
L4	14.66	12.08	0.824	-2.7	74%	-1.1	87%
Total:	52.59	40.30	0.766	-2.6	73%	-1.1	86%

Management of Risk Factors

- ▶ Adequate calcium and vitamin D

- ▶ Calcium rich dairy products are the greatest source of dietary calcium



- ▶ Supplements

- ▶ Many people require vitamin D supplementation



- ▶ Exercise - muscles get stronger when you make them work

- ▶ Weight bearing activity

- ▶ Postural exercises

- ▶ Balance exercises



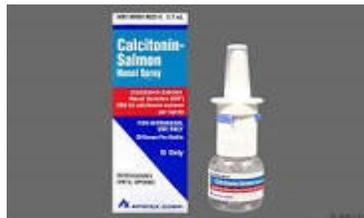
- ▶ Fall Prevention - home assessment, balance and strength



Medications to Treat Osteoporosis

▶ Anti Resorptive Medications

- ▶ Estrogen - no longer indicated for OP
- ▶ Bisphosphonate medicines (Fosamax, Actonel, Boniva, Reclast)
- ▶ RANK ligand inhibitor (Prolia)
- ▶ Calcitonin (Miacalcin)
- ▶ Estrogen agonist/antagonist medicines (Evista)



Medications to Treat Osteoporosis

- ▶ Anabolic Agents
 - ▶ Synthetic PTH - Forteo, Tymlos
 - ▶ Anti Sclerostin Ab - Evenity

Treating Osteoporosis

- ▶ After an osteoporosis related fracture - only 20 % of people are treated for osteoporosis
- ▶ ½ People who break a hip have had a prior fracture
- ▶ Out of 1,000 women, 500 will suffer a fracture without treatment for Osteoporosis



Who Should Seek Evaluation for Osteoporosis

History of a low trauma fracture after age 50 years - men and women

Premature menopause (<45 yo)

Women over age 65 years old

History of high risk medical conditions:

- Rheumatoid arthritis

- Celiac Disease

- Inflammatory Bowel Disease

Use of medications which increase risk of osteoporosis

- Steroids

- Anti-Seizure medications (some)

- Proton Pump inhibitors

- Thyroid medications

- Cancer chemotherapy medications

Osteoporosis

- ▶ Fracture prevention is the goal
- ▶ While bone loss is associated with aging, fracture is NOT a natural process
- ▶ Following a healthy lifestyle with consideration of treatment for individuals at risk is KEY to prevention of fractures
- ▶ 2 Million 2 Many

