

Bone and Muscle Health



Questions

- What is Osteoporosis?
- What is Osteopenia?
- What is Sarcopenia?



Osteoporosis and Osteopenia

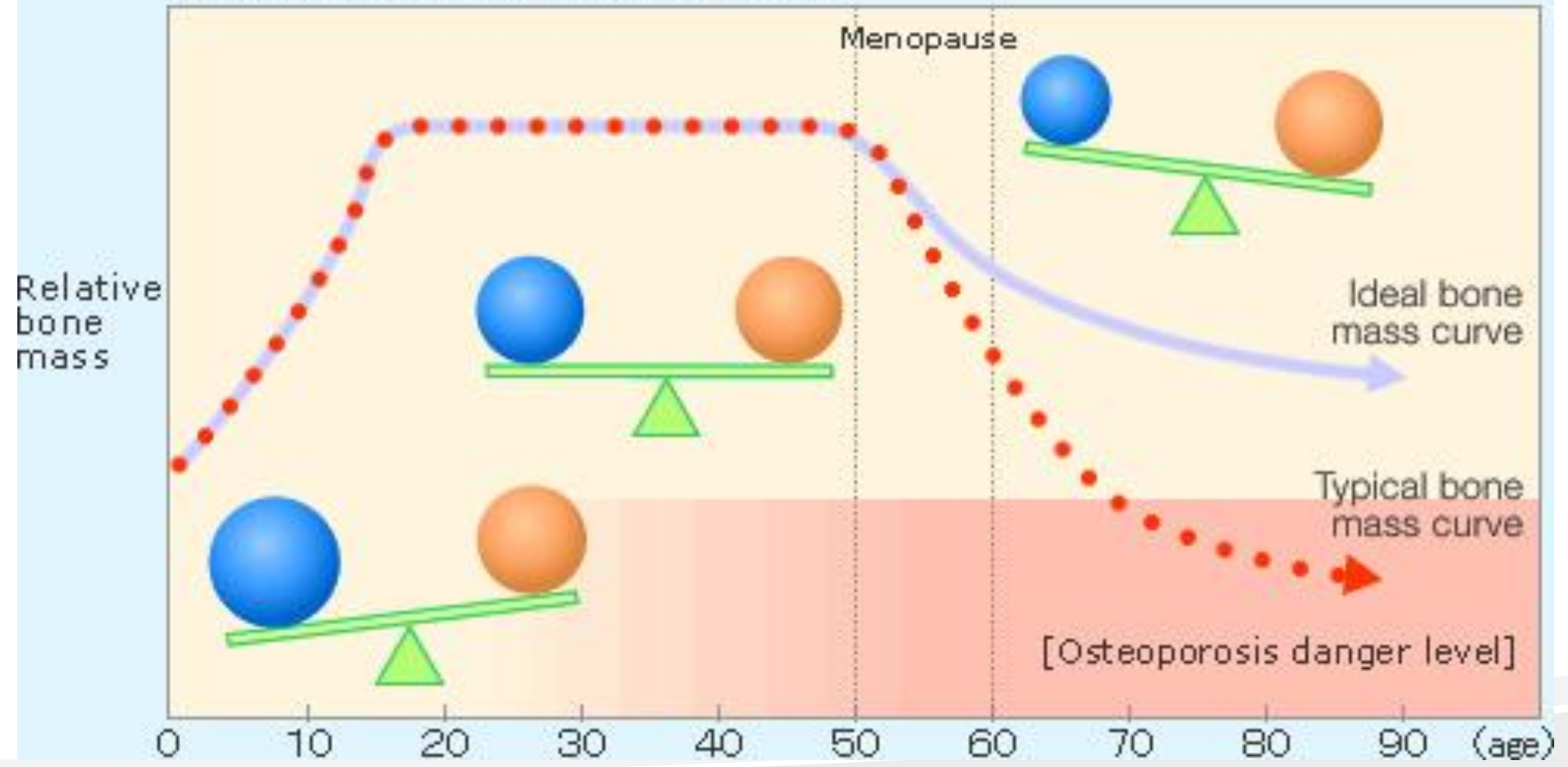
- Osteoporosis is decrease in bone mass leading to fragility and increased fracture risk.
- Osteopenia is decreased bone mass but not to the extent of Osteoporosis.
- Sarcopenia is loss of muscle tissue as part of aging process.



Normal Vs Osteoporotic Bone



Changes in bone mass by age





Sarcopenia





How are Muscle and Bone related

- How is bone health correlated to muscle health?
- How do you improve muscle health and bone health?
- Is it ever too late to start exercising and eating the right nutrients?
- Is it ever too early?
- Is lifestyle and nutrition enough to treat Osteoporosis?



Can you prevent or postpone Osteoporosis?

- Does it affect many people? Will I be affected? What is my lifetime risk?
- What can I do to decrease my risks for Osteoporosis and also my risks for fragility fractures?
- I have had a fracture in the past, does that increase my risks?
- I have family history of Osteoporosis, does that increase my risk?



Can I prevent fractures due to Osteoporosis?

Know your risk factors

Talk to your doctor

Talk to your family

Start regular physical activity

Start weight bearing exercises

You may need medications in addition to nutrition and exercise.



What are the usual risk factors?

- Age
- Previous fracture
- Medications, usually glucocorticoids
- Premature Ovarian failure or suppression
- Family history of Osteoporosis
- Low body weight
- Nicotine use
- Excessive alcohol intake
- Rheumatoid Arthritis, Celiac Disease other secondary Osteoporosis

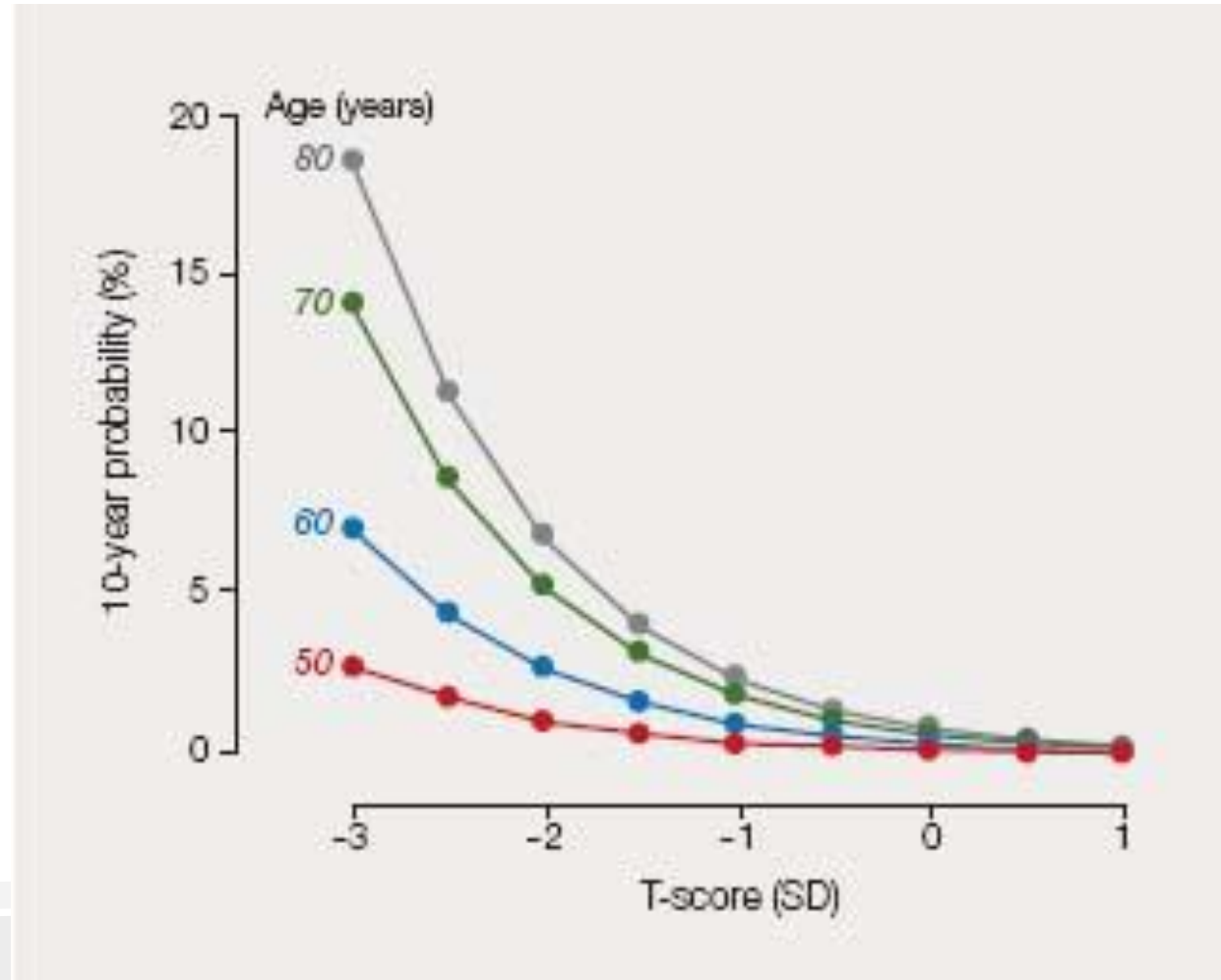


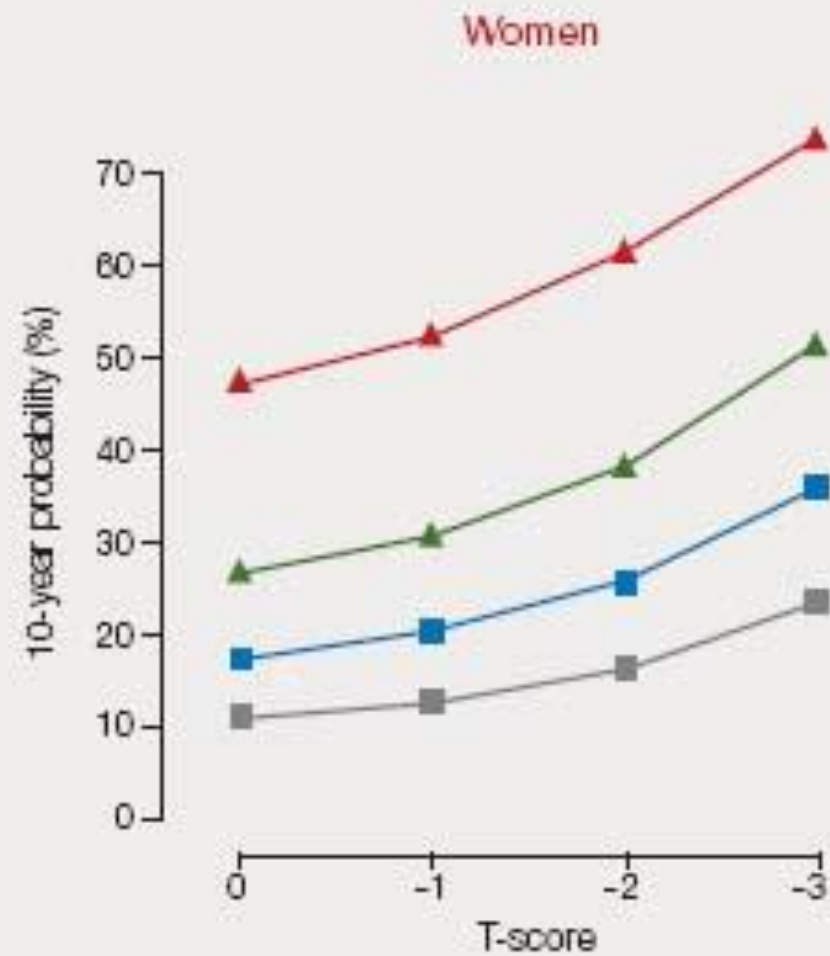
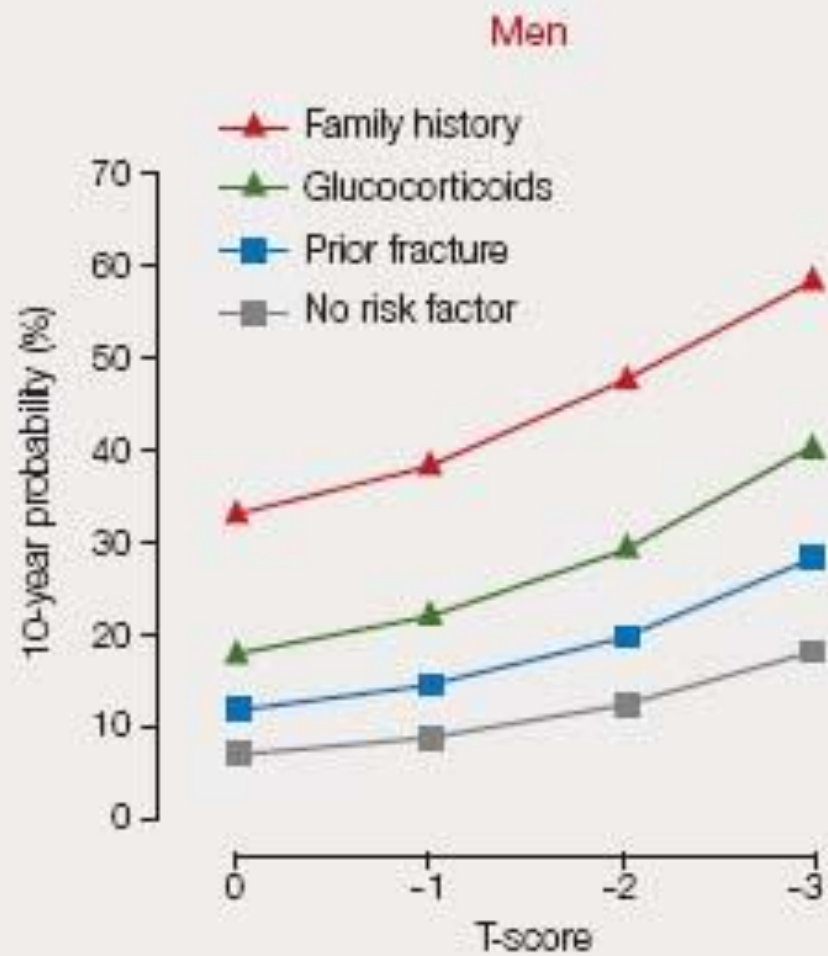
Frax

- <https://www.sheffield.ac.uk/FRAX/tool.aspx?country=7>
- Many who need appropriate medications are not on them and many who are on medications need not be on them. It is important to work with your physician to determining your 10 year risk of hip fracture.

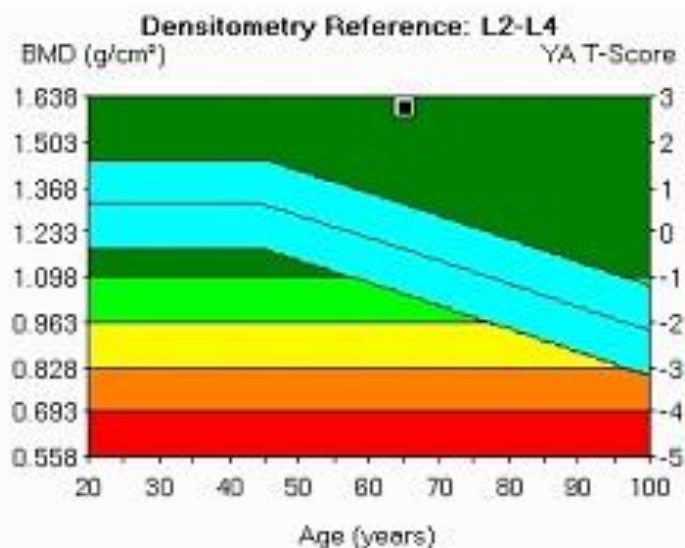
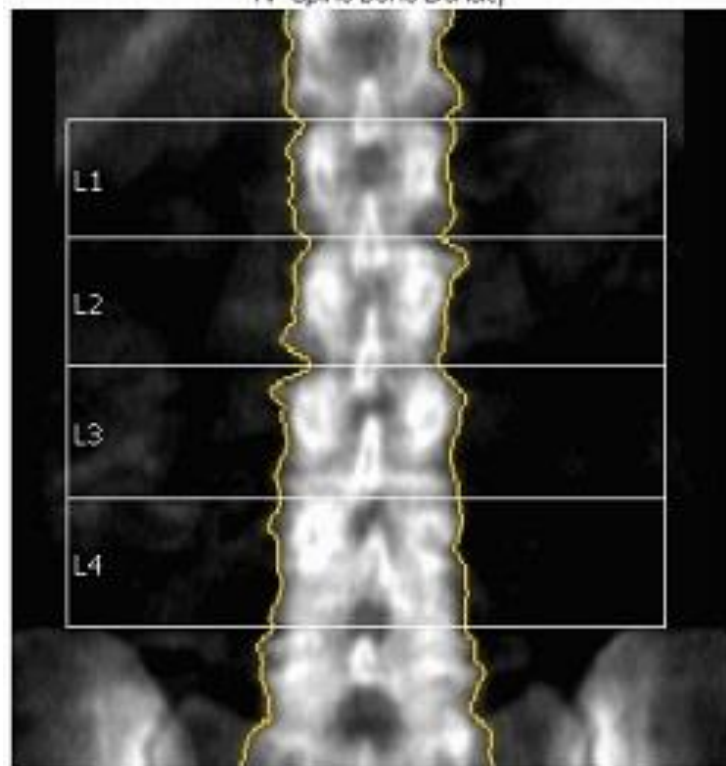


BMD & Age Determines Fracture Risk





AP Spine Bone Density



Region	1	2		3	
	BMD (g/cm ²)	Young-Adult (%)	T-Score	Age-Matched (%)	Z-Score
L1	1.321	119	1.6	124	1.9
L2	1.575	129	2.5	136	2.9
L3	1.605	127	2.5	135	3.0
L4	1.628	134	2.8	138	3.1
L1-L2	1.451	124	2.1	130	2.4
L1-L3	1.509	125	2.3	132	2.7
L1-L4	1.543	128	2.5	135	3.0
L2-L3	1.591	128	2.5	135	3.0
L2-L4	1.604	130	2.7	136	3.1
L3-L4	1.617	131	2.8	136	3.1

BONE DENSITOMETRY

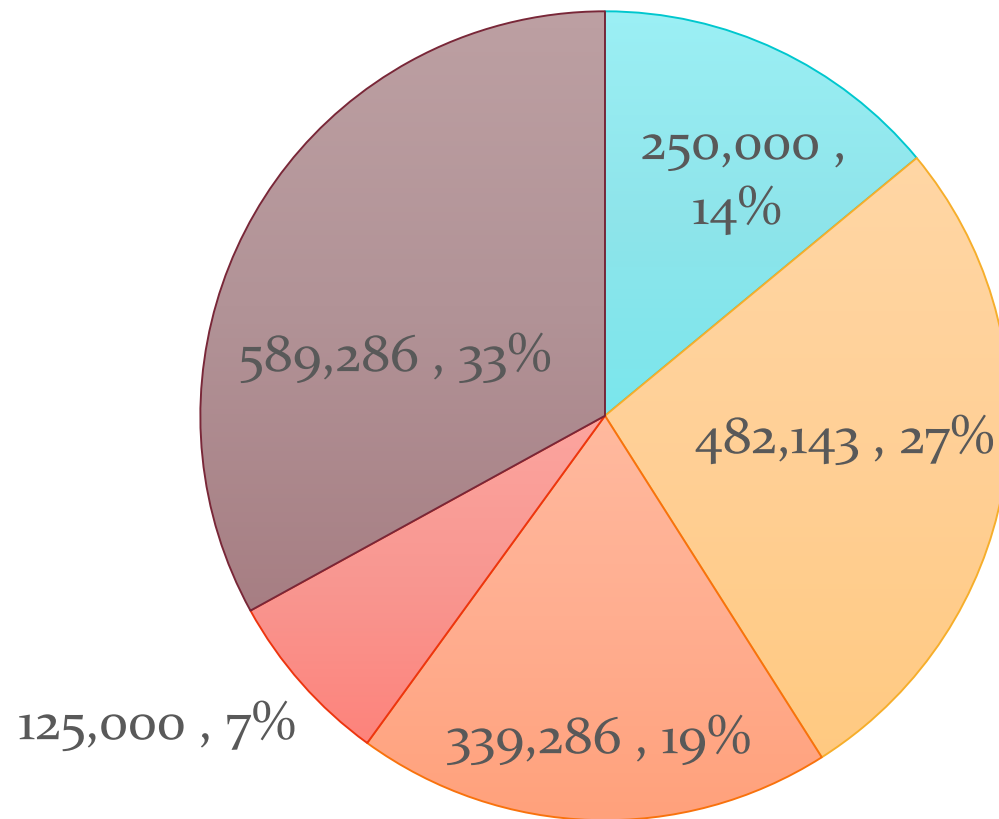


Osteoporosis is a severe Burden

- 1.5 Million new diagnosis of osteoporotic fractures per year
- 0.5 Million Hospitalizations per year
- 800,000 ER visits per year
- 180,000 Nursing home admissions a year.



What are the bones that are affected



■ Hip ■ Vertebral ■ Wrist ■ Pelvis ■ Other



Is there gender disparity?

- 1/3rd of hip fractures occurs in men
- 75,000 hip fractures a year
- Men are twice as likely to die in the first year after hip fracture, maybe because they are older.
- About 10 years following women the same age.
- Only 50% of men get treated for osteoporosis.

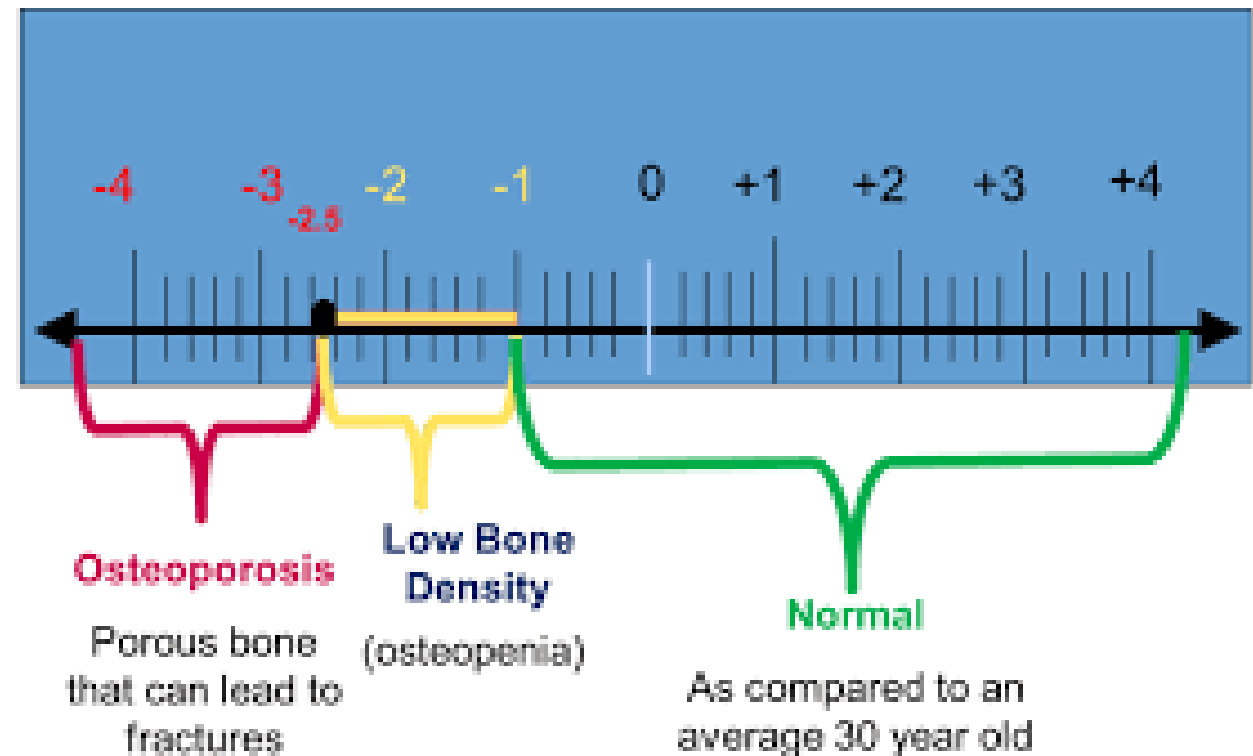


When do you test for bone loss?

- Women at 65 or older
- Men at 70-75 or older
- Younger women 50-65 with risk factors
- Adults with fractures at the age of 50
- Adults with conditions like RA or taking other meds.

What is the T score

- SD comparing your Bone density compared to normal young 30 yr old of the same sex.
- < -1 is Normal
- -1 to -2.5 is Osteopenia
- Below -2.5 is Osteoporotic





When is treatment recommended?

- When 10 year risk of hip fracture is 3% or greater.
- T score -2.5 or below
- Need to put risk factors together, FRAX helps.

But it is important to know that half of all Osteoporotic fractures occur in patients with Osteopenia.

Bone density is not a crystal ball



Medications

- Calcium
- Vitamin D
- **Alendronate Sodium** or **Alendronate Sodium plus Vitamin D₃** (Fosamax[®] and Fosamax Plus D)
- **Ibandronate Sodium** (Boniva[®])
- **Zoledronic Acid** (Reclast[®])
- **Calcitonin-Salmon** (Fortical[®] and Miacalcin[®])
- **Denosumab** (Prolia[®])
- **Raloxifene** (Evista[®])



Osteonecrosis of the jaw and Atypical fractures

- Almost exclusively seen in people who received very high doses of bisphosphonates. Extremely rare.
- Length of therapy matters when it comes to atypical fractures.

How much Calcium?

1000 – 1200 mg

National
Osteoporosis
Guidelines



- Can you take all of this at once? Or eat all of the foods high in calcium during breakfast, lunch or dinner?
- What if I am on Zantac or Prilosec or Pantoprazole?

































How much Vitamin D?

- We are a lot more cautious in recommending Vitamin D
- In most cases no more than 1000 IU daily
- D₂ vs D₃?





Foods that contain calcium

 Broccoli	 Onion	 Asparagus	 Pumpkin Seeds	 Cabbage	 Sapote
 Coconut Meat	 Green Beans	 Brazil Nuts	 Bok Choy	 Kohlrabi	 Kale
 Turnip Greens	 Mulberry	 Brussels Sprouts	 Avocado	 Okra	 Celery
 Sesame Seeds	 Fennel	 Butternut Squash	 Collards	 Gooseberry	 Dandelion Greens
 Swiss Chard	 Almonds	 Leeks	 Prickly Pear	 Artichokes	 Spinach



MAGNESIUM-RICH FOODS THAT YOU SHOULD EAT

- Brazil nuts
- Almonds
- Cashews
- Pine nuts
- Amaranth
- Edamame
- Dark chocolate
- Whole grains
- Dairy





Vitamin K (will interfere with Coumadin)

- Dark green leafy vegetables
- Nuts
- Asparagus
- To a smaller extent in herbs and spices



Got milk?





Aerobic Activity



THE kid's ACTIVITY PYRAMID

Each week you can have fun and be active by trying the following things...

With Friends

- Dance to music
- Play games like tag and hopscotch
- Join a sports team at school or the park

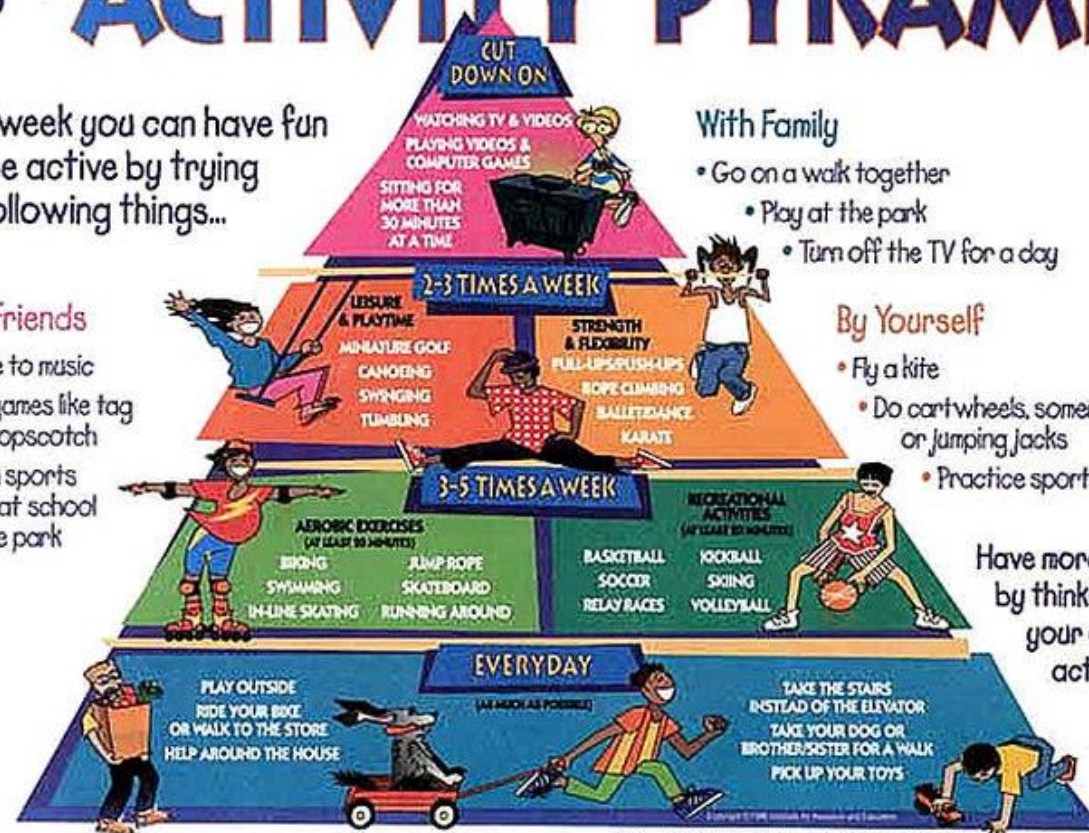
With Family

- Go on a walk together
- Play at the park
- Turn off the TV for a day

By Yourself

- Fly a kite
- Do cartwheels, somersaults or jumping jacks
- Practice sports skills

Have more fun by thinking up your own activities!



For additional copies, call 1-800-372-7776.



Body weight bearing exercises





Real Burden of Osteoporosis

- Osteoporosis has a significant impact on the everyday lives of those who suffer from the disease, as the following story clearly illustrates.
- This 73-year-old wife and grandmother suffered her first fracture 18 years ago and has had eight additional fractures since that time. Each caused tremendous pain and required long hospital stays and extended periods on medication. Unfortunately, however, because she does not tolerate osteoporosis medications well, her primary treatment has consisted of estrogen, vitamin D, and calcium supplements. As bad as the actual fractures have been, it is the fear of additional fractures that may well have the largest impact on her life. As a result of this fear, she limits the time she spends with her grandchildren, as well as the types of activities she enjoys with them (three of her fractures occurred while playing with her grandchildren). She finds it impossible to lie down on her back or right side and difficult to get in and out of bed or a chair. She has had to give up dancing, one of her favorite activities, and feels she has become a “drag” on family members who must slow down to accommodate her limitations



Velma Chapman

"Tai Chi" Participant

... M... MS...
YMCA OF Western North Carolina



Take Home Messages

- Fractures due to Osteoporosis are serious but preventable
- Your risk for Osteoporosis depends on many factors
- Lifestyle changes slow and may stope progression, may not reverse, but think long term, you are exercising and eating right for your 85 year old self.
- Medications are safe when used appropriately.



Contact

Aruna Nathan MD PA

www.drarunanathan.com

(301) 949 1010