

Preventing and Treating Osteoporosis

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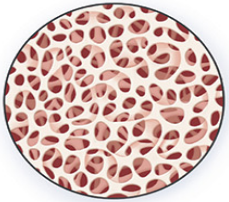
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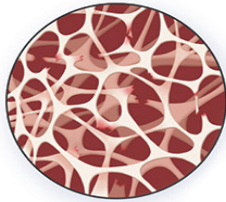
What is osteoporosis?

Osteoporosis

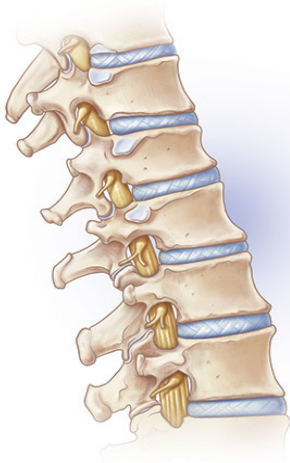
High bone density
Healthy



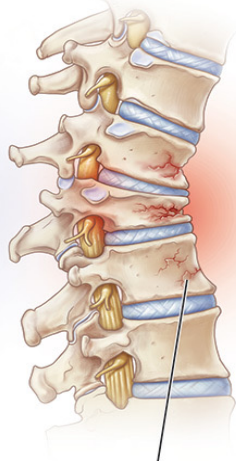
Low bone density
Osteoporosis



Healthy spine



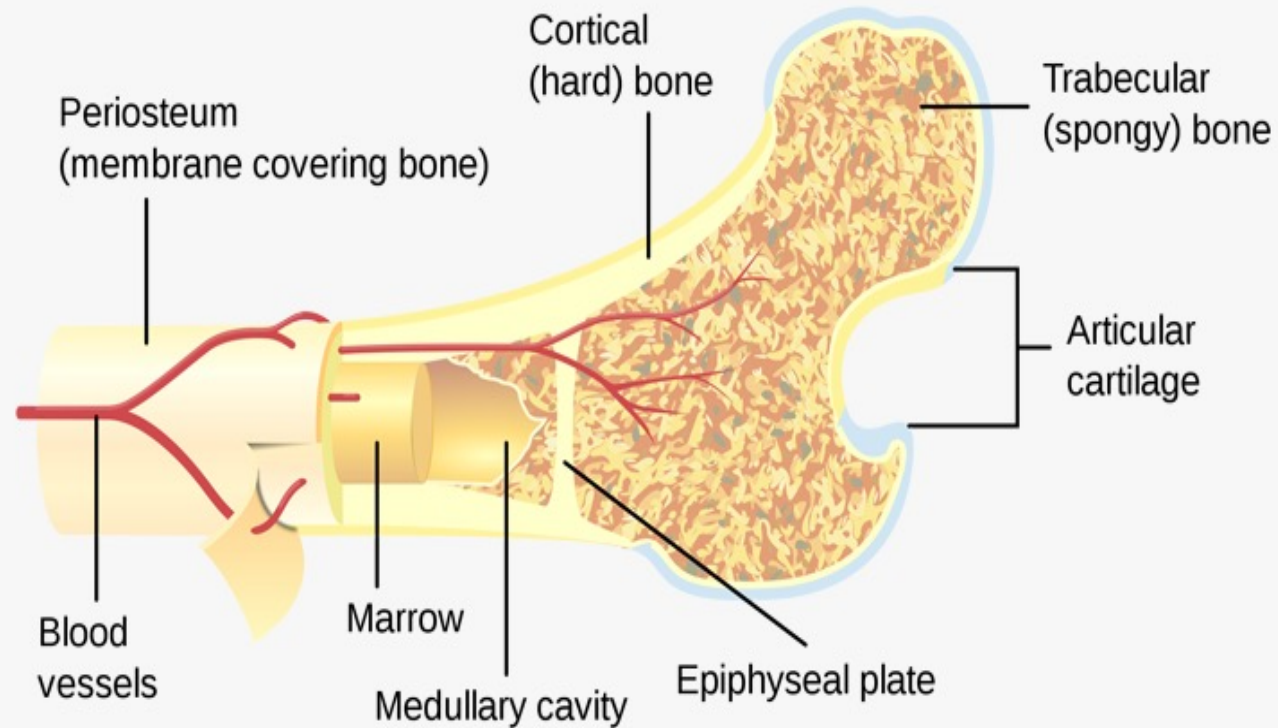
Spine with osteoporosis



Compression fracture

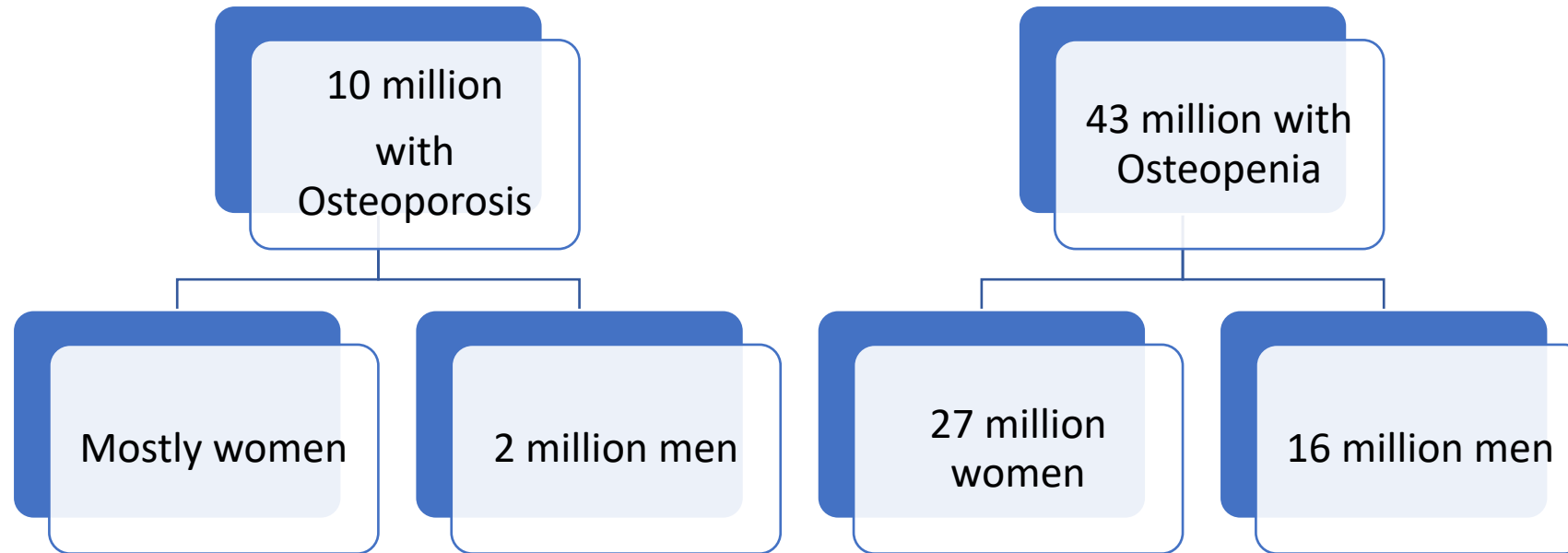
Osteoporosis is characterized by low bone mass, microarchitectural disruption, and skeletal fragility, resulting in decreased bone strength and an increased fracture risk.

Bone Structure Basics

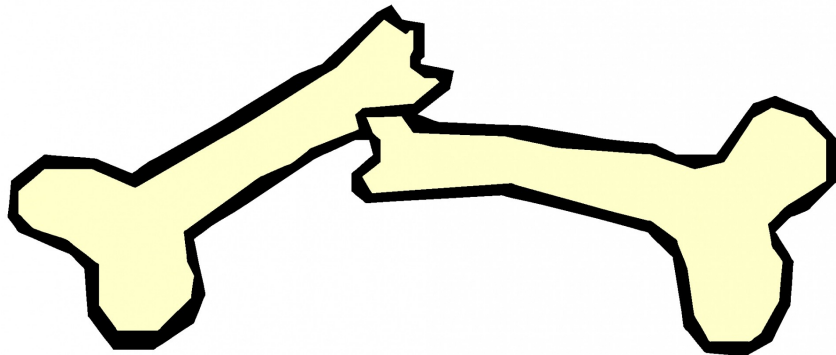


Bone_cross-section.svg by Pbroks13 on Wikimedia Commons is used under a CC BY 3.0 (<https://creativecommons.org/licenses/by/3.0>) license.

the-detail-of-the-bones-the-structure-of-the-bones-spongy-bone-tramčina-close-up-structure on pxfuel are used according to the pxfuel Terms of Use.



- FRACTURE
- FRAGILITY FRACTURE



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Prevalence of Fractures



In America:
1/2 Women
1/4 Men

 **1/3**



 **1/5**



Impact of Fractures

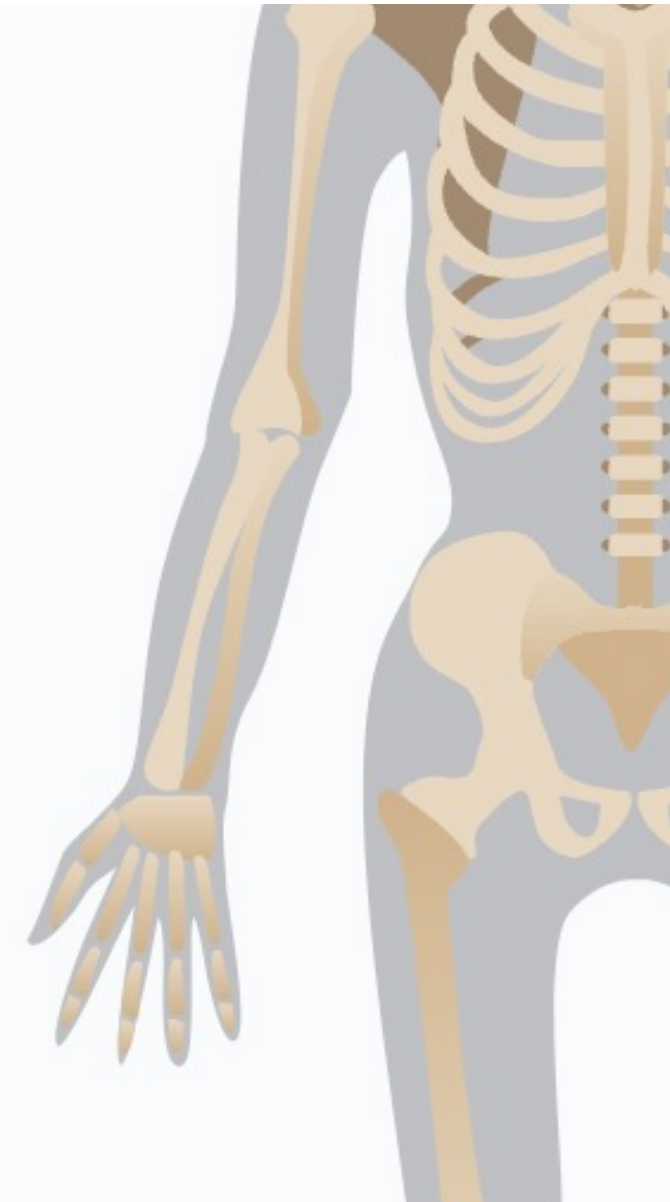


- Pain
- Decreased mobility and function
- Fear of falling
- Decreased quality of life
- Increased mortality
- Increased healthcare cost
- More fractures

Risk Factors of Osteoporosis

Non-modifiable risk factors	Modifiable risk factors
Advanced age	Smoking
Family history of osteoporosis	Excess alcohol intake
White/Asian race	Inadequate calcium and vitamin D intake
Female gender	Chronic steroid use
Low BMI	Chronic opioid use
Low peak bone mass	Hypogonadism


Kidney failure, liver disease, rheumatoid arthritis, inflammatory bowel disease






PREVENTION

- Adequate calcium intake
- Adequate vitamin D intake
- Exercise
- Maintain healthy body weight
- Avoid smoking
- Limit alcohol consumption
- Diet rich in fruits and vegetables
- Fall prevention



CALCIUM-RICH FOODS

Created by TheHealthnut-Corner



Calcium in diet +
Supplements = 1,200 mg a
day

CALCIUM CONTENT IN SELECTED FOODS		
FOODS	SERVING	CALCIUM CONTENT
Fortified Cereal.....	1 cup	1 000 mg
Sweet Potato (cooked).....	1 medium	43 mg
Yoghurt	1 cup	415 mg
Sardines with bones.....	3 oz.	351 mg
Spinach (cooked)	1 cup	245 mg
Patchoi (cooked).....	1 cup	158 mg
Dasheen Bush (cooked).....	1 cup	125 mg
Okro (cooked)	1/2 cup	61 mg
Edamame (cooked)	1 cup	98 mg
Tofu	1 cup	573 mg
Sesame Seeds (roasted)	1 oz.	140 mg
Soybeans (cooked)	1/2 cup	84 mg
White Beans (cooked)	1/2 cup	80 mg
Fortified Orange Juice	1 cup	500 mg

DAILY NEEDS FOR CALCIUM (RDA)			
AGE GROUP	MALE	FEMALE	PREGNANCY & LACTATION
1-3 years	700 mg	700 mg	
4-8 years	1000 mg	1000 mg	
9-13 years	1300 mg	1300 mg	
14-18 years	1300 mg	1300 mg	1300 mg
19-50 years	1000 mg	1000 mg	1000 mg
51 -70 years	1000 mg	1200 mg	
71 years ≥	1200 mg	1200 mg	

Calcium supplements

- Only 40 % of the medication is elemental calcium
- Best absorbed in acidic environment
- Take with meal
- Taking proton pump inhibitors reduces absorption



Calcium carbonate

Tums
Os-cal
Calcium gummies



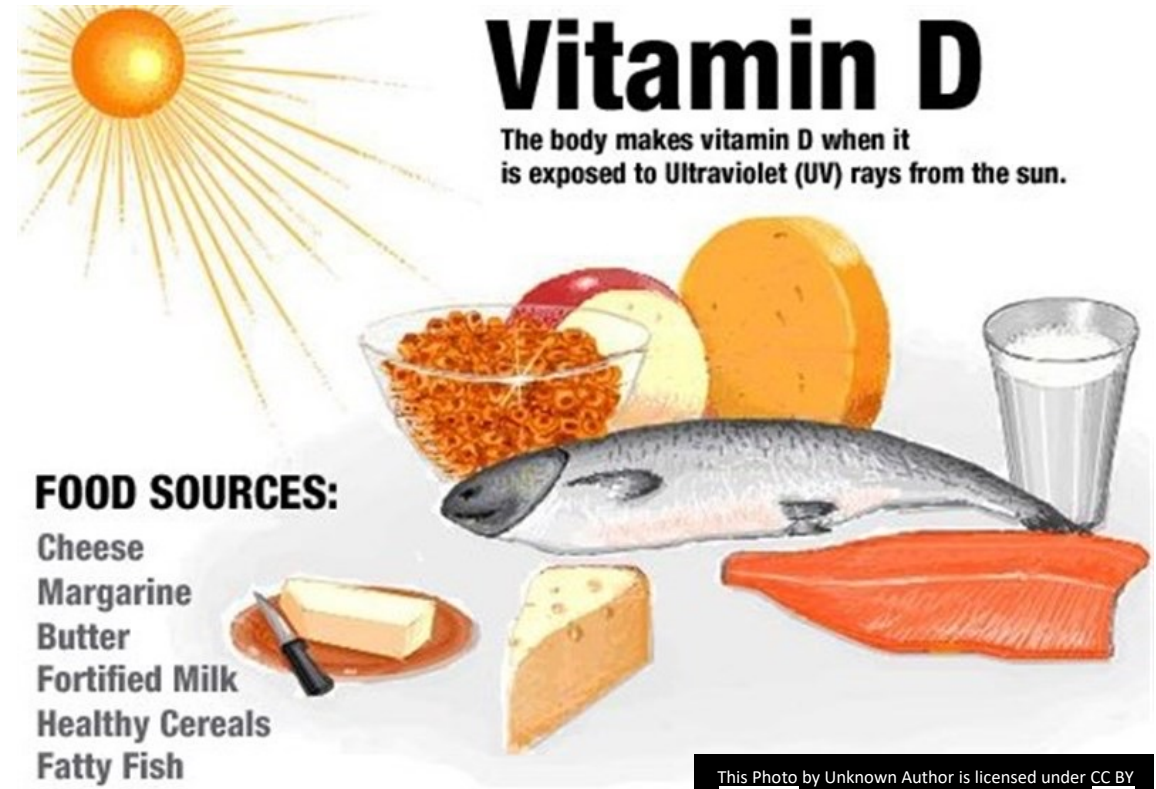
Calcium citrate

Now Foods
Citracal

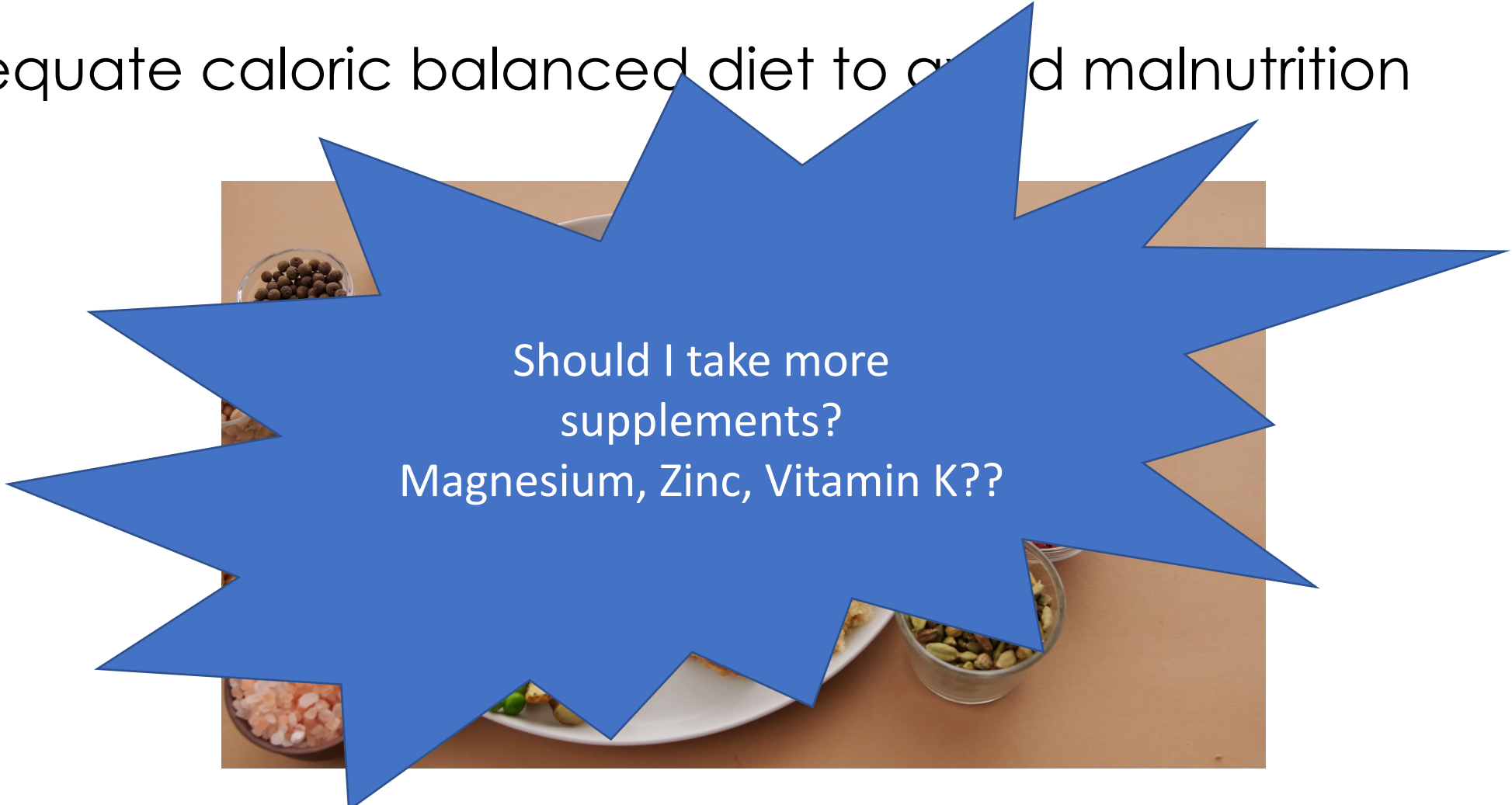
- Only 21 % of the medication is elemental calcium
- Better absorbed
- Not necessary to take with meals
- Not affected by PPIs
- Mostly used by patients who had bariatric surgery
- Have to take more pills to get the adequate dose

Adequate Vitamin D intake

- 800 IU of Vitamin D daily
- Higher doses required in some situations



- Adequate caloric balanced diet to avoid malnutrition



Should I take more
supplements?
Magnesium, Zinc, Vitamin K??

Exercises

- 30 minutes on most days of the week
- Muscle strengthening
- Posture training
- High intensity vs low intensity?



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Fall Prevention

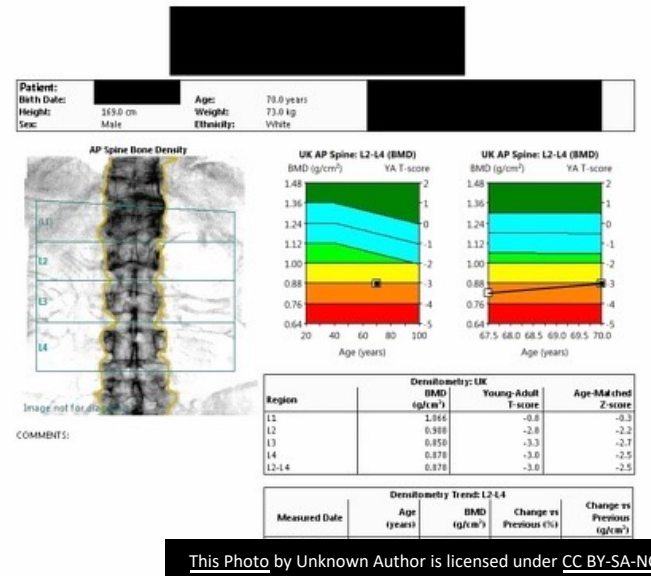
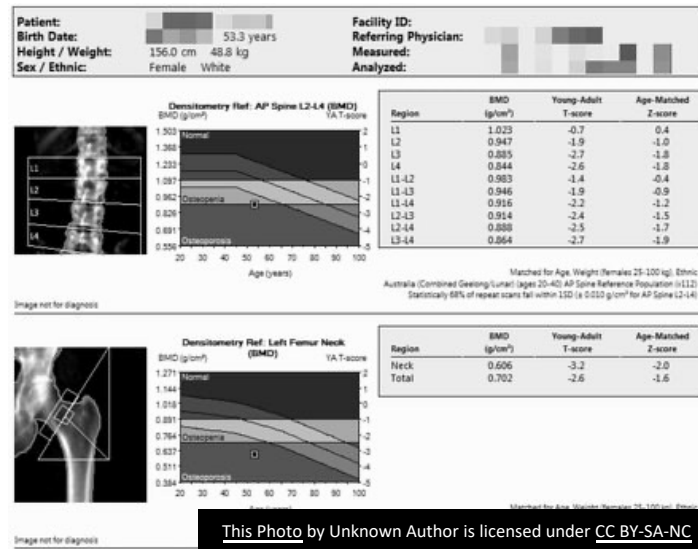


Who to Screen?

- Women age 65 and older
 - Men age 70 and older
- Anyone age 50 or older who has had a fragility fracture or has risk factors



Diagnosis of Osteoporosis



- Diagnosed based on DEXA scan T score at spine or hip -2.5 or less
- FRAX score for major osteoporotic fracture 20% or more and for hip fracture 3% or more
- Presence of Fragility fracture



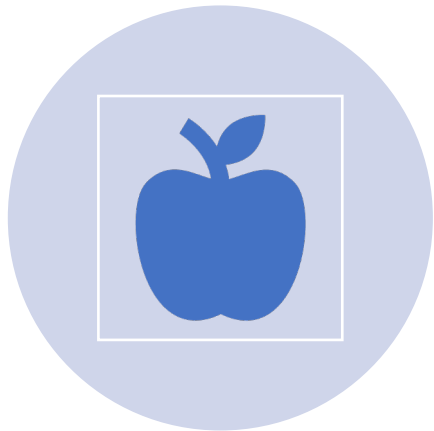
Who To Treat?

- Anyone with established diagnosis of Osteoporosis based on DEXA scan T score, FRAX score or Fragility fracture.
- Presence of certain risk factors.

I have a diagnosis, now what?

- History
- Assessment of risk factors
- Blood tests including vitamin D, chemistry, kidney function, liver function, PTH, urine calcium, SPEP, bone turnover markers
- Treatment





ADEQUATE CALCIUM AND VITAMIN D INTAKE
BALANCED DIET



EXERCISE



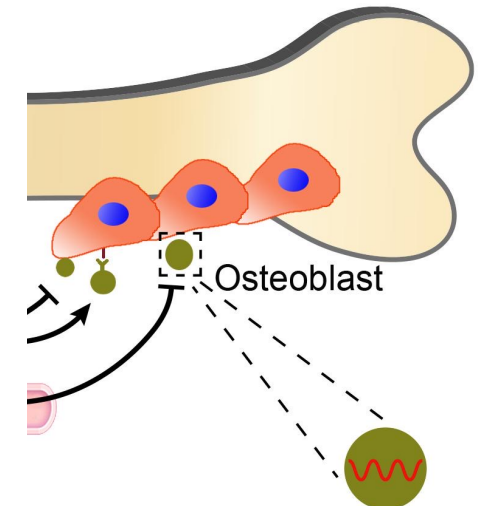
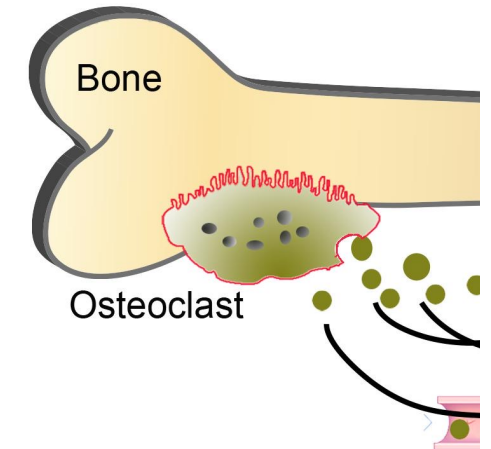
PHARMACOLOGICAL TREATMENT

Slow Rate of Bone Loss (Anti-resorptives)

- Alendronate (Fosamax)
- Risendronate (Actonel)
- Ibandronate (Boniva)
- Zoledronic acid (Reclast, Zometa)
- Denosumab (Prolia)
- Estrogen
- Raloxifene (Evista)/Bazedoxifene (vivant)
- Calcitonin

Promote New Bone Formation (Anabolics)

- Teriparatide (Forteo)
- Abaloparatide (Tymlos)
- Romosozumab (evenity)



Alendronate (Fosamax)

Bisphosphonate

Once a week pill

44 % reduction in vertebral fracture

40% reduction in hip fracture

17% reduction in non-vertebral fracture risk

Given for 5 years then reassess for drug holiday

Risendronate (Actonel)

Bisphosphonate

Once a day, once a week, once a month

Reduction in both vertebral and non-vertebral fractures

Given for 5 years then reassess for drug holiday

Ibandronate (Boniva)

Bisphosphonate

Oral once a month, IV every 3 months

31 % reduction in vertebral fracture

Not approved for reduction in non-vertebral fractures

Given for 5 years then reassess for drug holiday

Zoledronic acid (Reclast/zometa)

Bisphosphonate

Once a year infusion

Reduction in vertebral and non-vertebral fractures

Given for 3 years then reassess for drug holiday

May have flu like illness, body aches, pain, low grade fever after infusion

Denosumab (Prolia)

Antibody (inhibits RANKL)

Sub-Q shot every 6 months

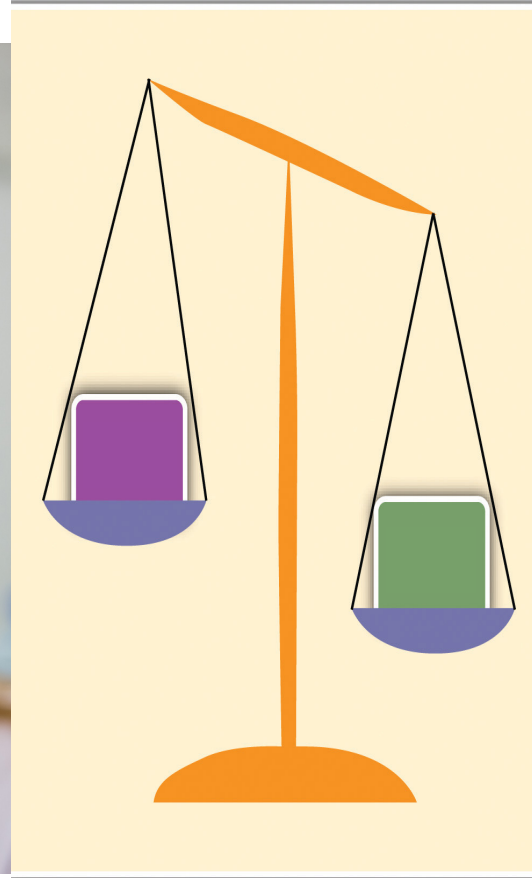
68 % reduction in vertebral fracture

39% reduction in hip fracture

19% reduction in non-vertebral fractures

Given for 5-10 years then reassess for drug holiday

Osteonecrosis of Jaw (non-healing ulcer)



Atypical femur fracture



Teriparatide (Forteo)

Parathyroid hormone analogue

Daily injection

74% reduction in vertebral fracture

39% reduction in non-vertebral fractures

Given for 2 years then switch

~~Randomized controlled trial~~

Abaloparatide (Tymlos)

Parathyroid hormone related peptide analogue

Daily injection

Similar to Teriparatide

Reduces both vertebral and non-vertebral fractures

Given for 2 years then switch

Romosozumab (Evenity)

Inhibits the action of 'Sclerostin'

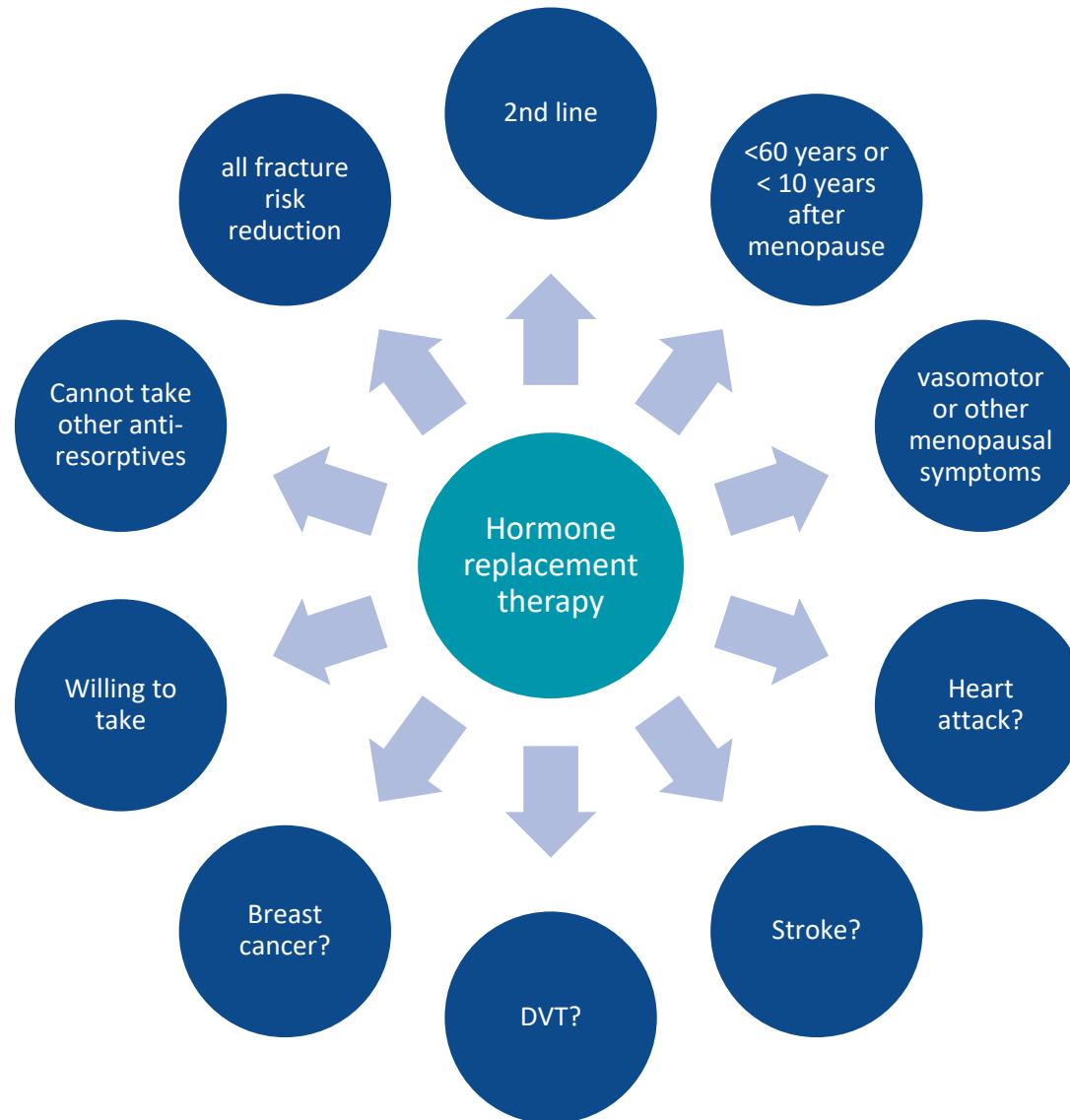
Monthly injection

Reduces risk of both vertebral and non-vertebral fractures

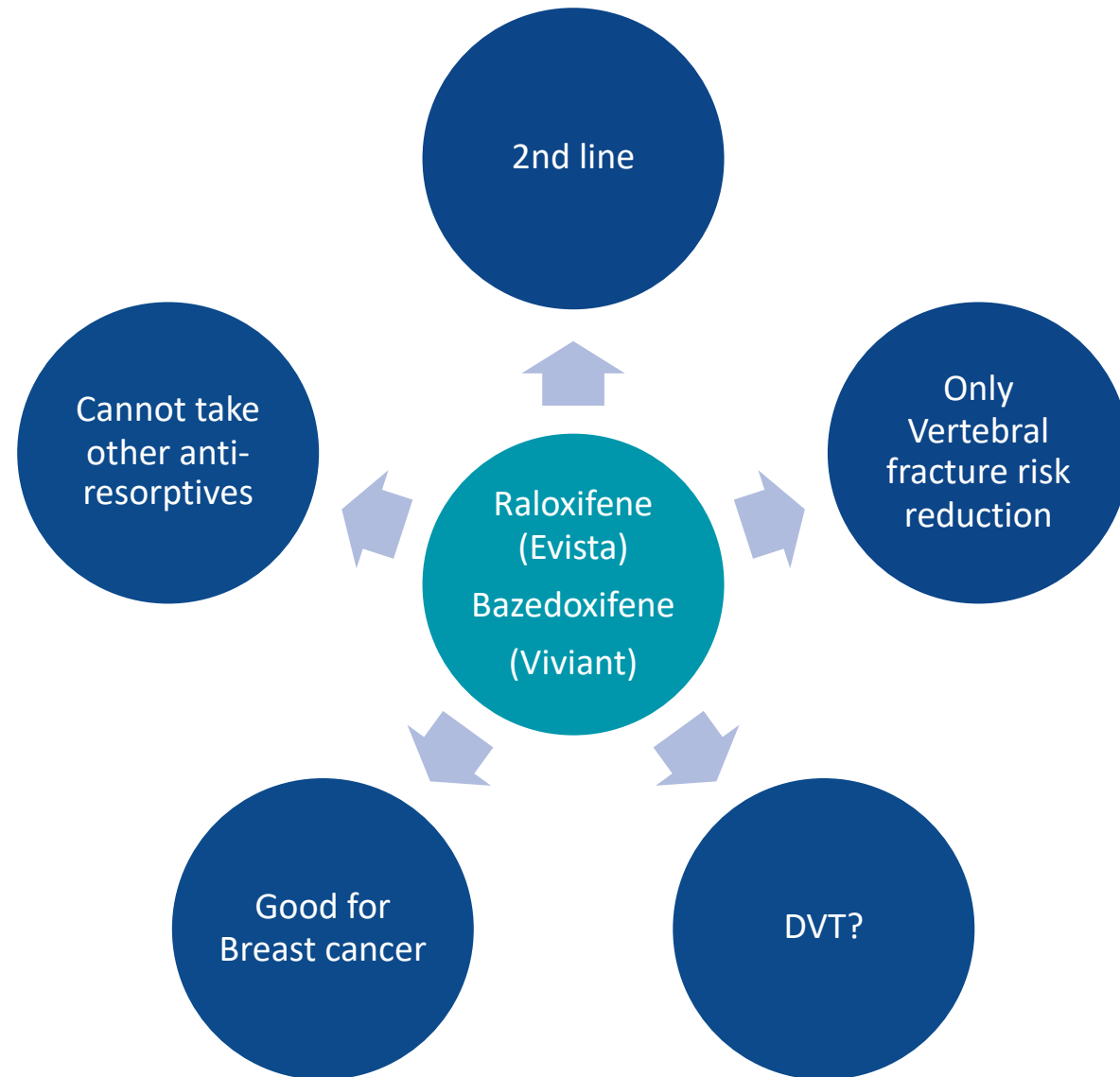
Given for 1 years then switch

Not given to people with history of stroke or heart attack in past year

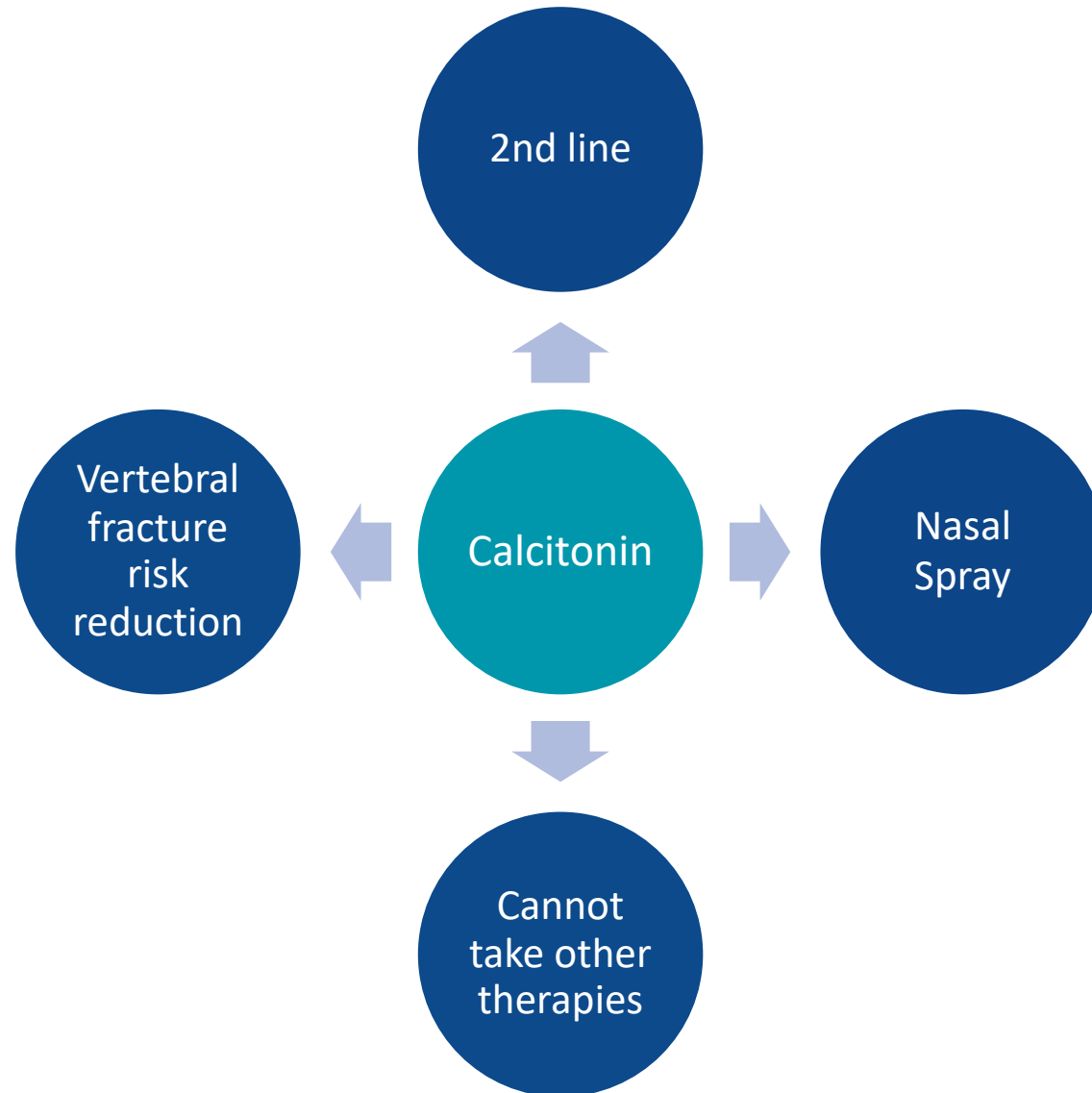
Estrogen/Progesterone



Selective Estrogen Receptor Modulators



Calcitonin (Naturally occurring hormone)



"Building strong bones is not just about preventing fractures; it's about creating a foundation for a healthier, more vibrant life. Take small steps today for a stronger tomorrow."

Thank you!

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