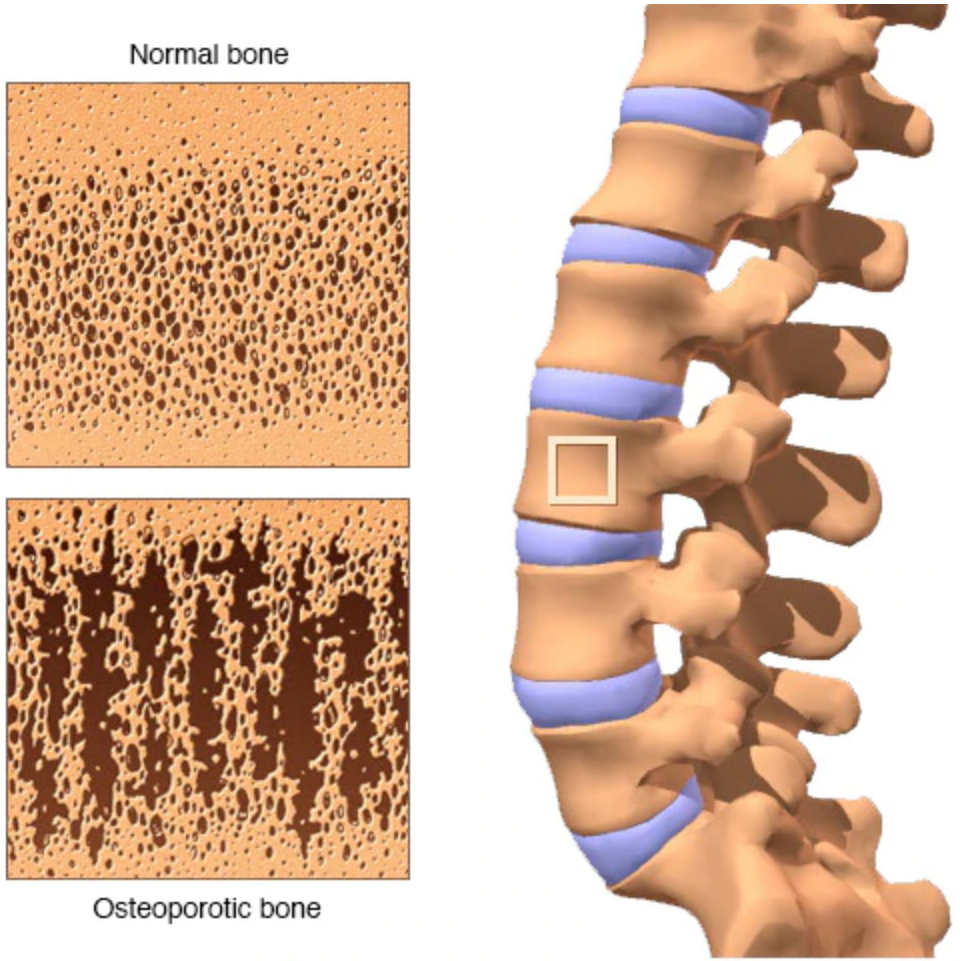
Osteoporosis

Aws Khanfar

Definition

- Loss of bone mass



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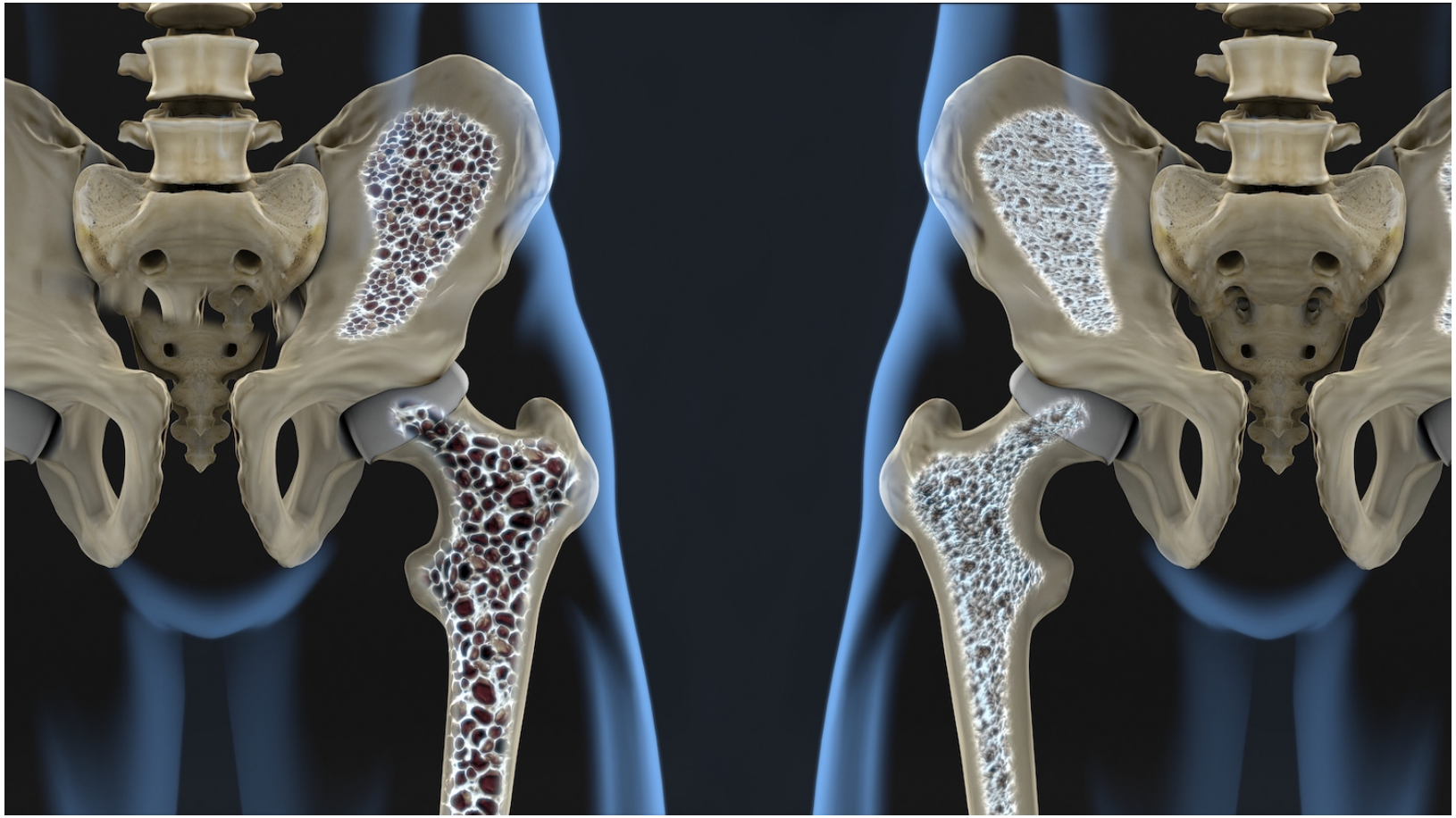
- It results from the loss of oestrogen



- The oestrogen will promote the osteoblast to produce collagen
- The mineralization is normal
- It affects mainly cancellous areas of bone

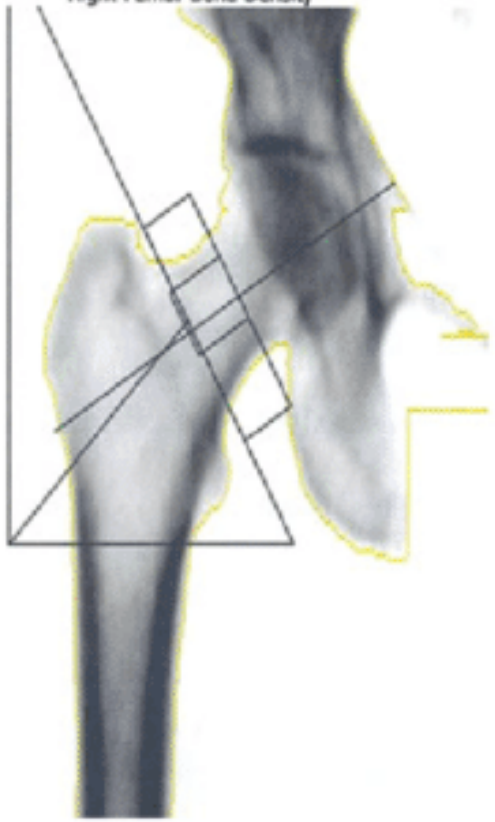
- The osteoclast activity is normal but collagen production is decreased

- Diagnosed by DXA scan,
- T- score : how many standard deviations the patient’s bone mass is in comparison to a 24-year old healthy individual
- Z-score: how many standard deviations the patient’s bone mass is in comparison to an age matched population
- Normal: -2.5to +2.5

A

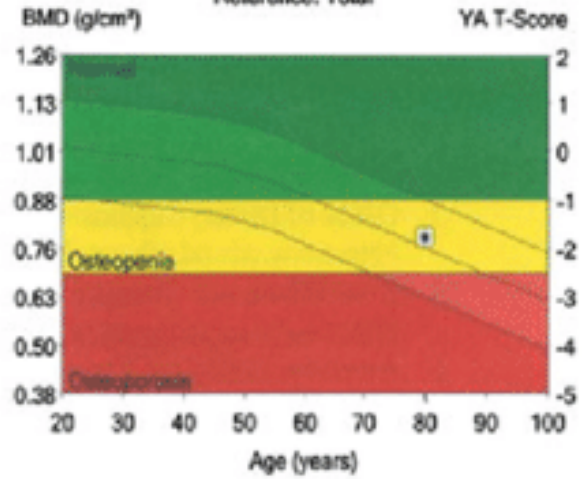
Patient:	####
Birth Date:	[redacted] 79.8 years
Height / Weight:	161.8 cm 75.8 kg
Sex / Ethnic:	Female White

Right Femur Bone Density



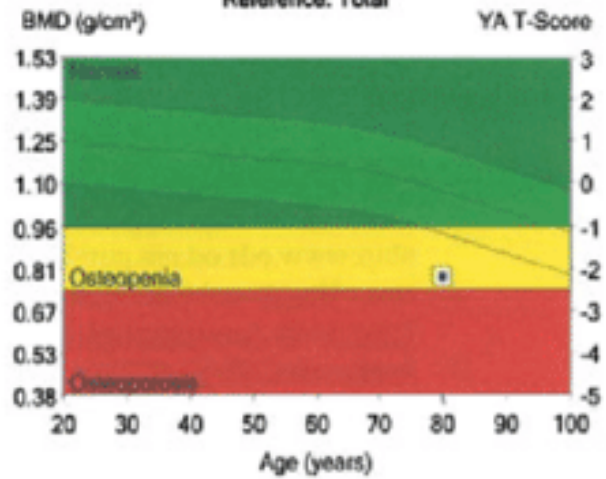
B

White Female



Region	BMD [1] (g/cm²)	Young-Adult [2] (%)	Young-Adult [2] T-Score	Age-Matched [3] (%)	Age-Matched [3] Z-Score
Neck	0.756	73	-2.0	102	0.1
Total	0.785	78	-1.8	104	0.2

Black Male



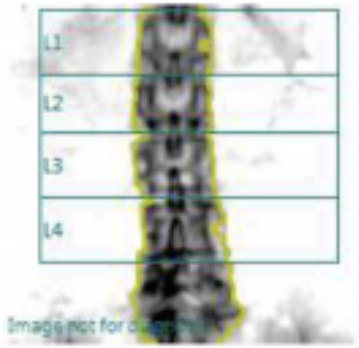
Region	BMD [1] (g/cm²)	Young-Adult [2] (%)	Young-Adult [2] T-Score	Age-Matched [3] (%)	Age-Matched [3] Z-Score
Neck	0.756	71	-2.4	75	-1.9
Total	0.785	71	-2.2	73	-2.0

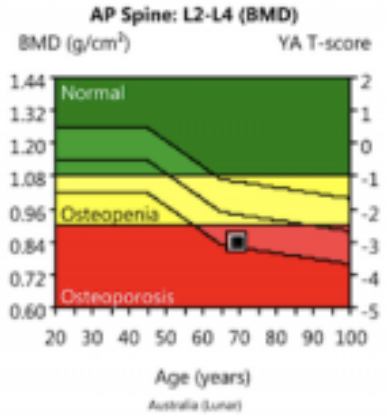
1 - Statistically 68% of repeat scans fall within 1SD (± 0.012 g/cm² for Right Femur Total)

2 - NHANES (ages 20-30) / USA (ages 20-40) Femur Reference Population (v107)

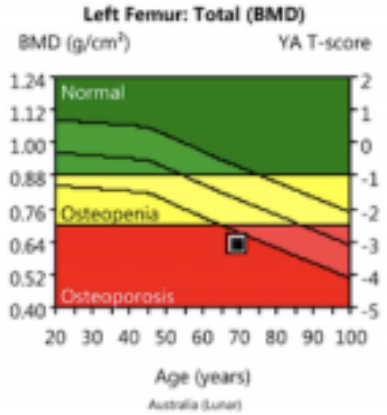
3 - Matched for Age, Ethnic

11 - World Health Organization - Definition of Osteoporosis and Osteopenia for Caucasian Women: Normal = T-Score at or above -1.0 SD; Osteopenia = T-Score between -1.0 and -2.5 SD; Osteoporosis = T-Score at or below -2.5 SD; (WHO definitions only apply when a young healthy Caucasian Women reference database is used to determine T-Scores.)

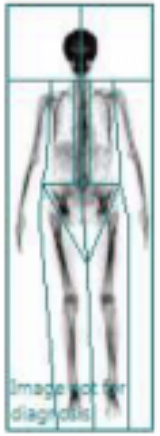


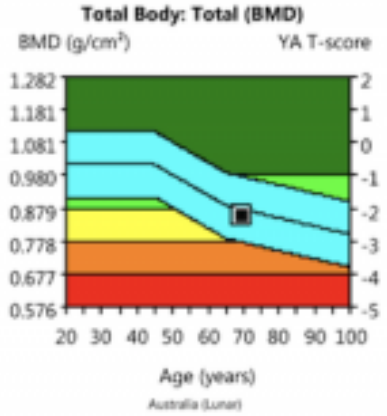


Region	BMD (g/cm²)	YA T-score	AM Z-score
L1	0.691	-3.7	-1.5
L2	0.734	-3.9	-1.7
L3	0.815	-3.2	-1.0
L4	0.950	-2.1	0.1
L1-L2	0.712	-3.8	-1.6
L1-L3	0.749	-3.5	-1.3
L1-L4	0.803	-3.1	-1.0
L2-L3	0.777	-3.5	-1.4
L2-L4	0.838	-3.0	-0.8
L3-L4	0.884	-2.6	-0.5



Region	BMD (g/cm²)	YA T-score	AM Z-score
Neck	0.615	-3.0	-1.1
Total	0.631	-3.1	-1.4





Region	BMD (g/cm²)	YA T-score	AM Z-score
Head	1.872	-	-
Arms	0.679	-	-
Legs	0.815	-	-
Trunk	0.645	-	-
Ribs	0.504	-	-
Spine	0.848	-	-
Pelvis	0.663	-	-
Total	0.857	-2.2	-0.2

Predisposing factors

- Female
- Caucasian or Asian
- Smoking , Alcohol, malnutrition , malabsorption
- Steroid use, anti epileptics
- Low Body mass index
- Low vit D, hyperthyroidism, hyperparathyroidism
- Early menopause
- Lack of exercise of immobility
- Chronic medical illnesses

Prevention

- Walking
- Vit D ??
- Vit C and E ??
- Phyto-oestrogens

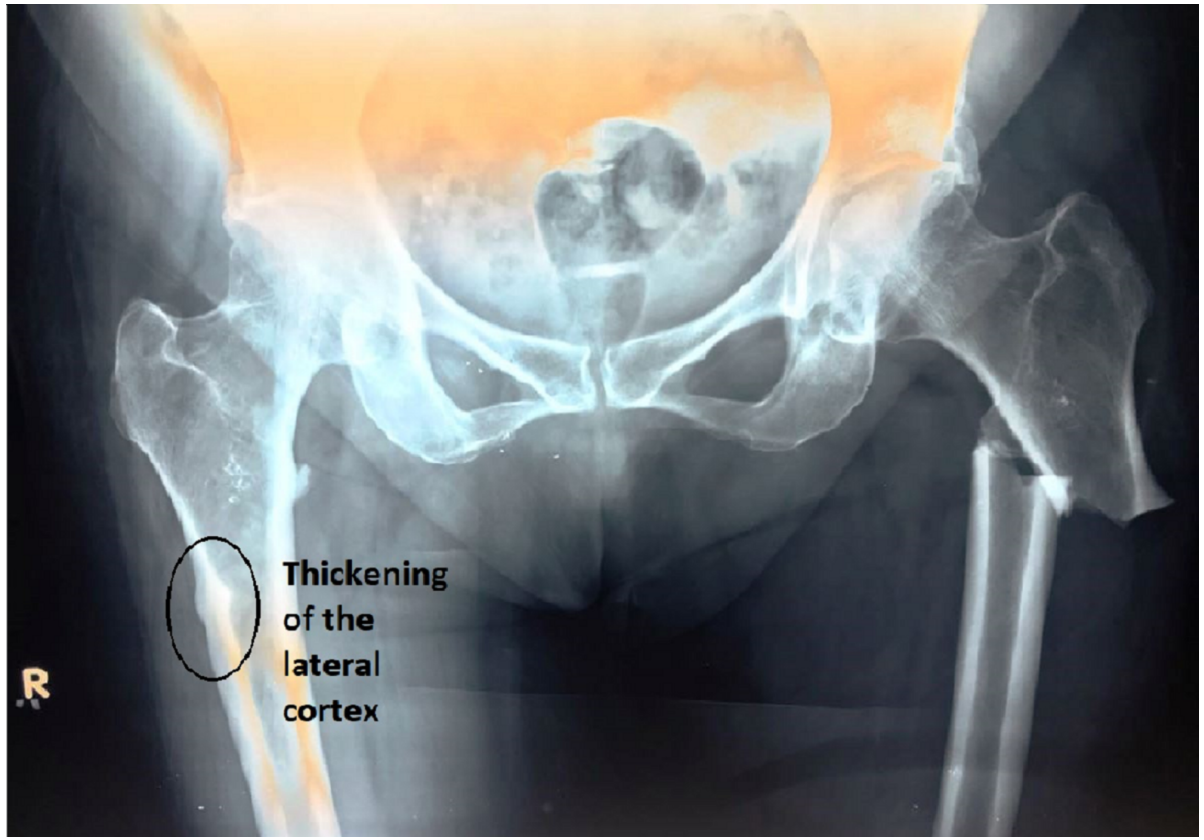
Treatment

- Increase production
- Oestradiol supplement (risk of breast and uterine malignancy)
- Raloxifene (no breast or uterus malignancy)
- Tibolone

Bisphosphonates

- Osteoclast inhibitor
- Indirect increase in bone mass
- First line: alendronate or risedronate
- Second line : IV Pamidronate or
- rarely: strontium ralenate or teriparatide (increased risk of DVT-PE)

- All have the risk of fractures if administered more than three years due to inhibition of remodeling of bone



- Thank you