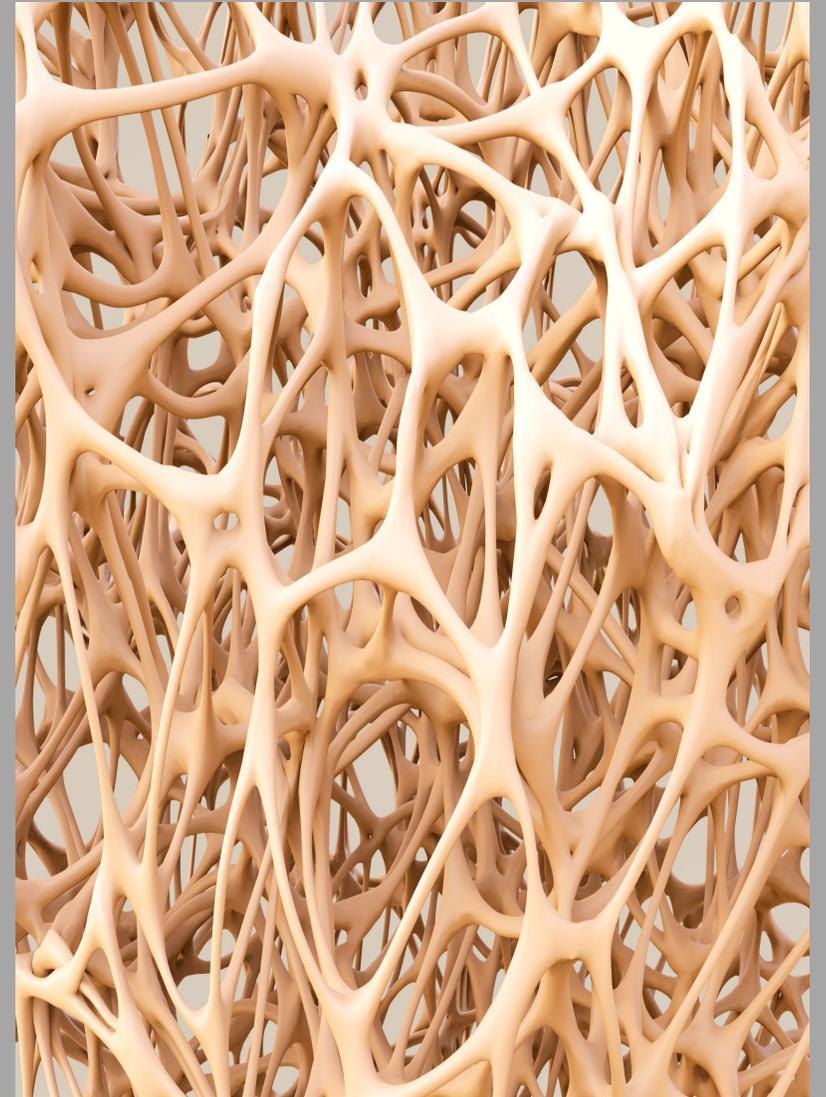


Don't Crush it!

Osteoporosis

Thank you for your
professionalism and passion!

Cherry Baker
FitPro



- Copies of this presentation are available from my web site for one month.
- Password
- Cherry's LunchED Club Facebook
- Monthly VIP group
- Full online Osteoporosis course Pilates specific can be bought from FitPro online education or from my web site.

With Thanks to



- SpineSafe Pilates
- National Osteoporotic Society
- International Osteoporosis foundation
- Later life Training
OTAGO
Chair Based
PSI
- Sheila Done OSTEOLATES

Why am I here?

- Seated exercise advert
- Facebook Post
- The response – lets discuss

“It’s what they do in everyday life”

“ We don’t want to create fear of movement”

Supposedly menopausal weight training and Yoga programmes – arghhhh!

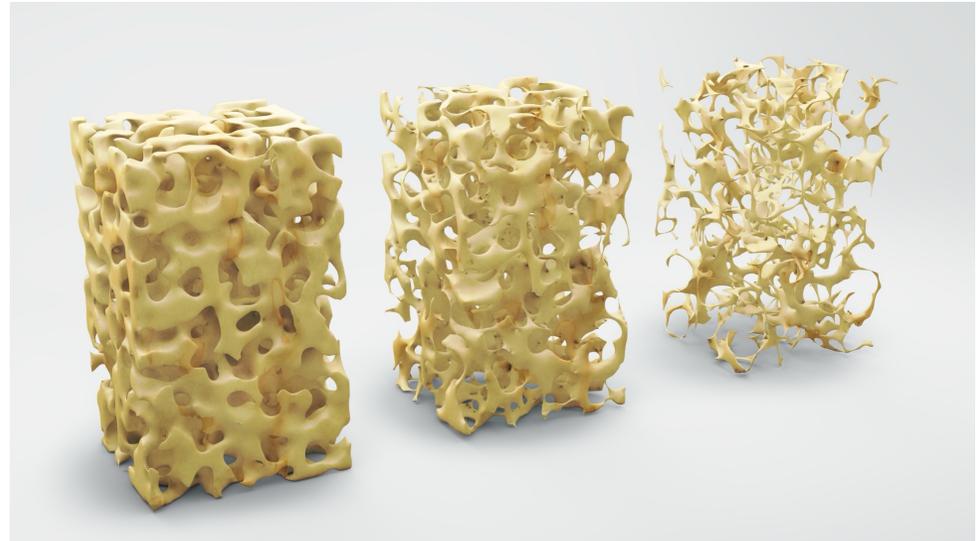
Aims:

- Develop an understanding of the terms osteoporosis and osteopenia
- Develop an awareness of signs and symptoms of osteoporosis
- Understand DEXA scan results and relation to your exercises teaching
- Understand the do's and don'ts for clients with Osteopenia and osteoporosis

LIMITATIONS OF TODAY'S WORKSHOP

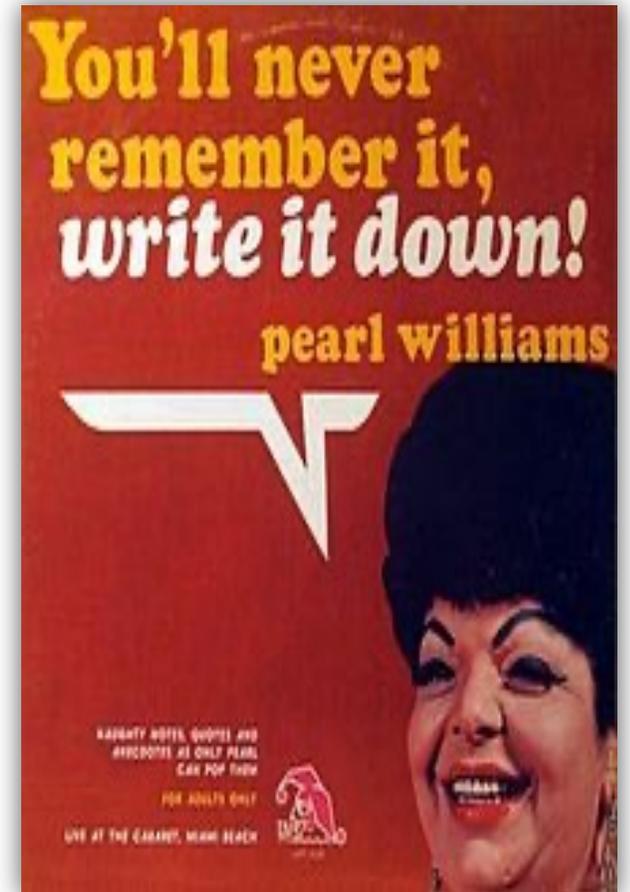
1 Why are you here?

2 What experience have you had with osteoporosis

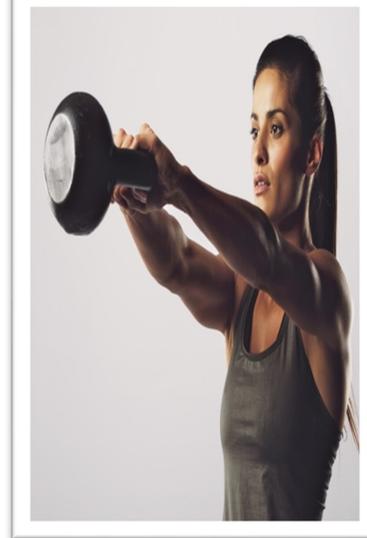
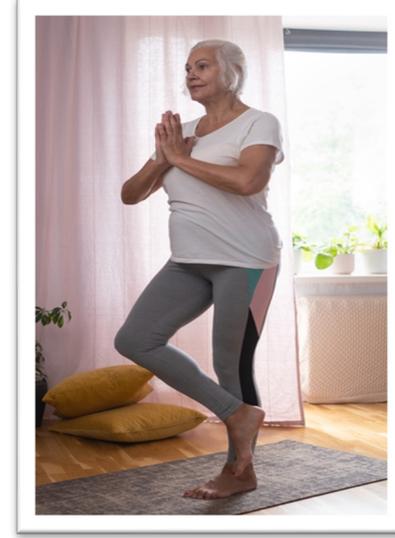
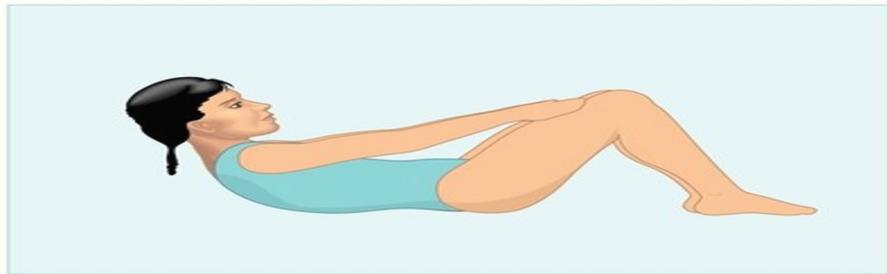
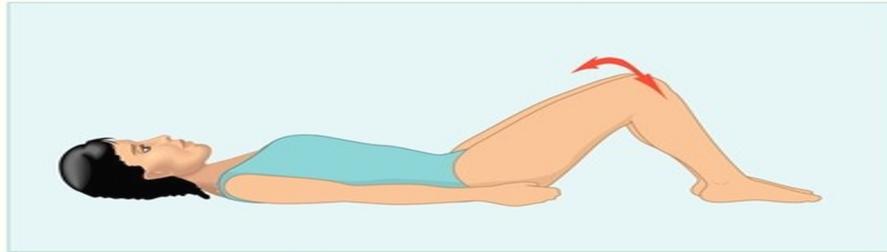
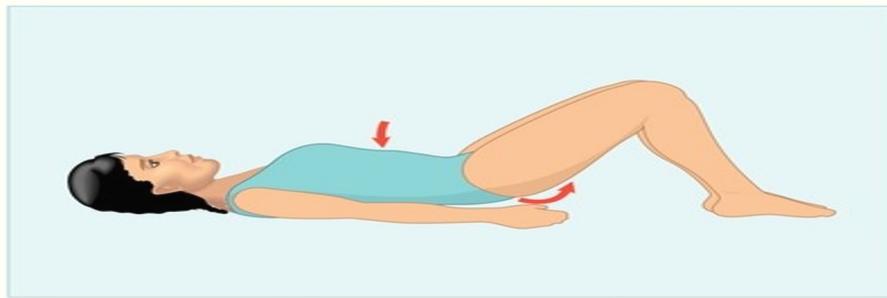


Let's Go...

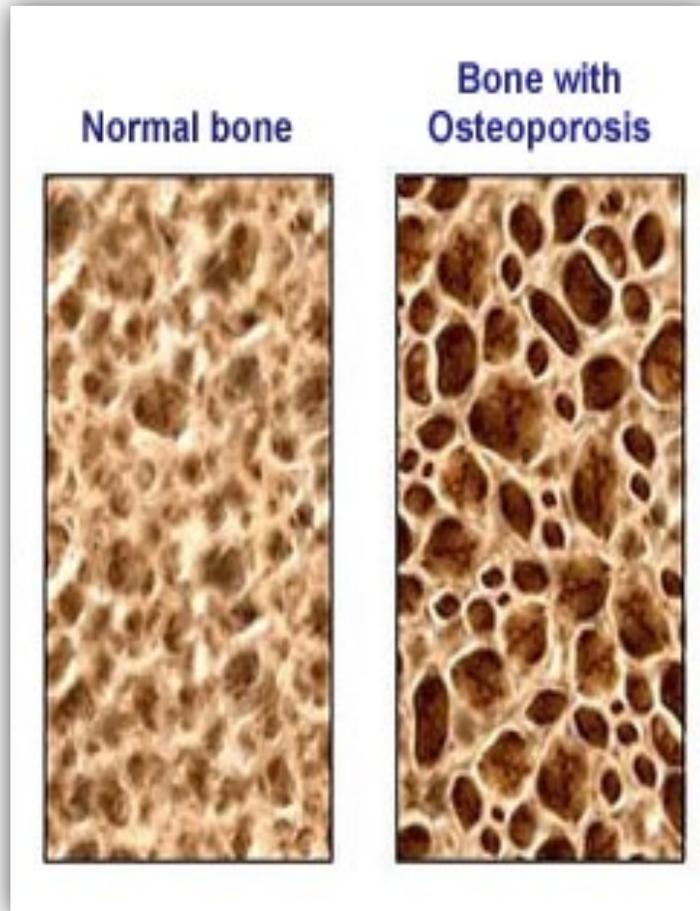
- Please write down four of your favourite exercise you are currently teaching in the exercise discipline of your choice.
- Consider an Intermediate or Advanced movement



Workshop – let's test what you know now and at the end?



What is Osteoporosis?



Systemic skeletal disorder characterised by **low bone mass** and **micro architectural deterioration** of bone tissue with consequent increase in bone fragility and susceptibility to **fracture**

(Consensus Department Conference 1993)

Bone becomes thinner and more fragile

Increasing the fracture risk?

No standing activity leads to active loss of bone and muscle 4 hrs daily

1 wk. bed rest ↓ strength by ~ 20%

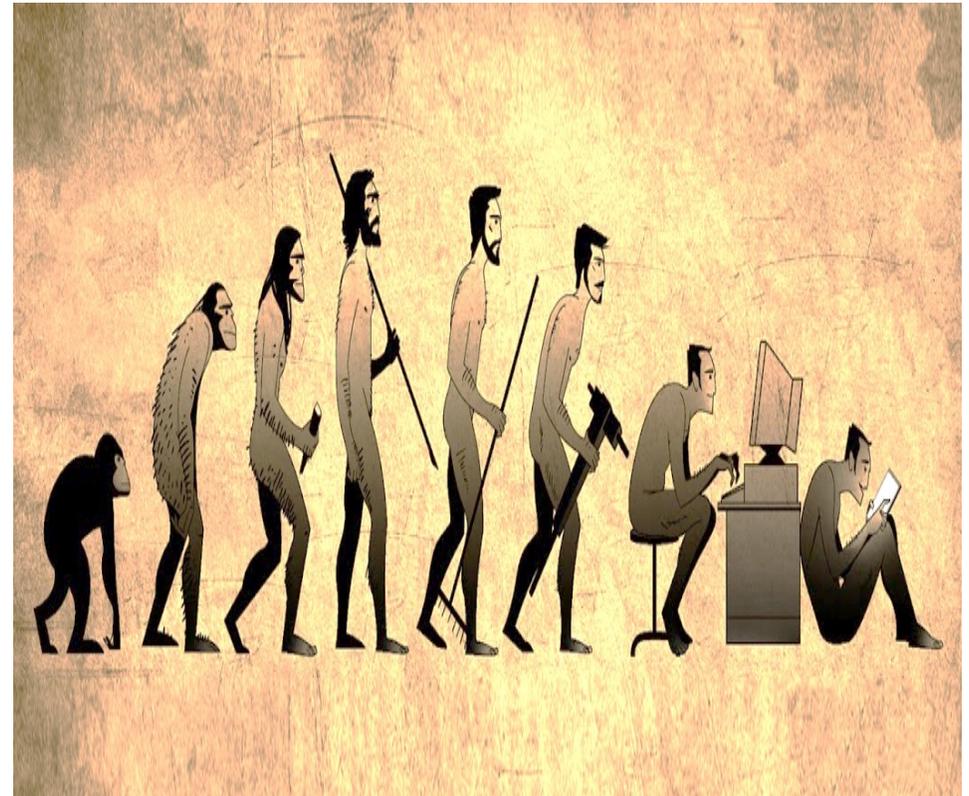
1 wk. bed rest ↓ spine BMD by ~1%

Nursing home residents spend 80-90% of their time seated or lying down

Its not just old people

What about you ?

What about your clients?



Osteoporosis

- A disorder of bone density due to an imbalance between bone formation and bone re-absorption
- Commonly referred to as ‘brittle bone disease’
- This bone disorder is characterised by low bone density and deterioration in the structure of the bone
- The condition can affect all bones , the most common are the vertebra, radius and neck of femur are the bones most affected
- Leads to increased risk of fracture, in the vertebrae this often occurs as a compression fracture or wedge fracture
- Osteopenia is considered a precursor to Osteoporosis



Bone Cells – read up

- **Osteoblasts**

Bone Building Cells



- **Osteoclasts**

Bone Re-absorption



- Why do we need them ?

- During growth - Osteoblasts more dominant
- During adulthood - Equal balance
- Ageing process - Osteoclasts more dominant

Osteoporosis

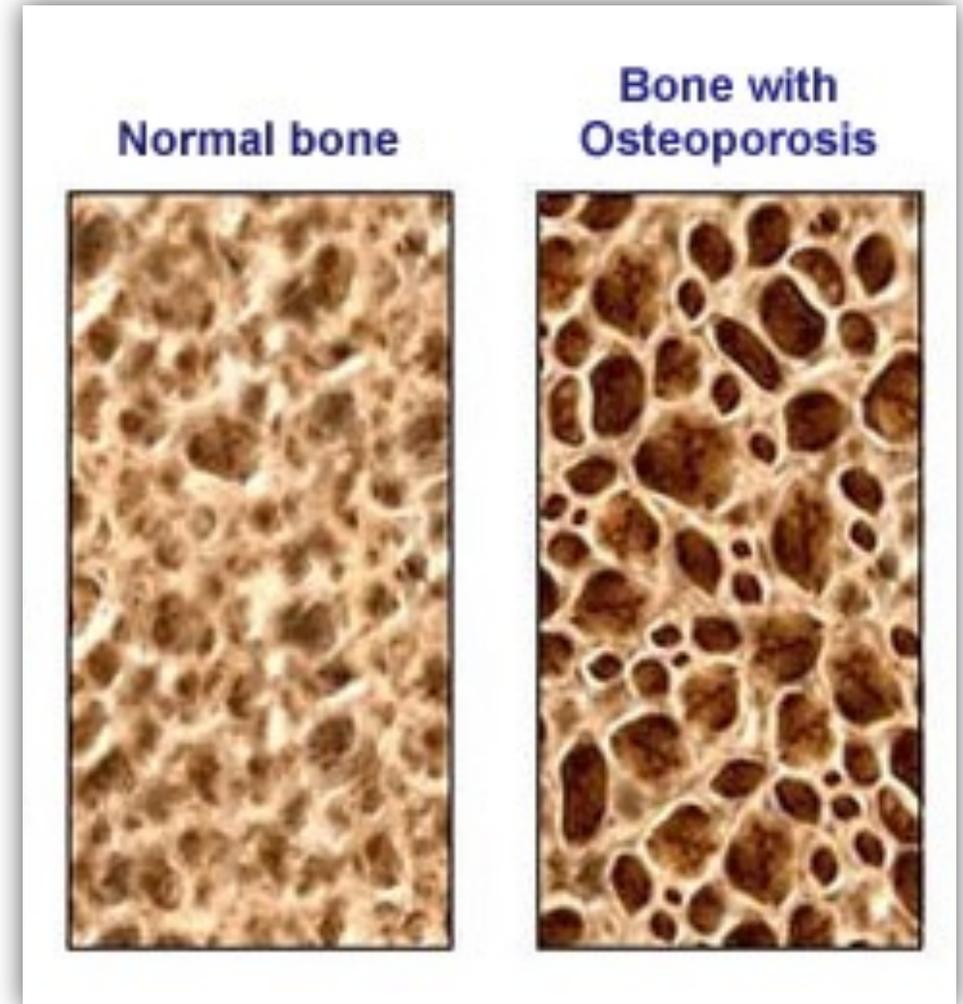
- .Due to time restraints we will not discuss primary and secondary osteoporosis this is covered in the online osteoporosis course



Why is this contraindicated in people with osteoporosis?

Warning signs

- Posture
- Loss height
- Sudden back pain over 45 no obvious cause
- Fracturing bones from minor incident
- Low body weight
- Early menopause without hormone replacement
- Eating disorders
- Women lack of periods
- Chemotherapy
- Medications such as steroids



- **Its not just old people
and women.....**

Factors That Influence Peak Bone Mass

- Diet
- Alcohol
- Smoking
- Inactivity
- Low body weight
- Over exercising
- Age
- Genetics
- Gender
- Hormones
- Early menopause/hysterectomy
- Long term use of steroids (< 3m)
- Medications
- Eating/digestive disorders
- Chemotherapy

(Modifiable and non-modifiable factors)

Some medications can cause osteoporosis:

Medications

- steroids (like prednisolone)
- some anti-epileptic drugs
- anti-[oestrogen](#) treatment for breast cancer (such as aromatase inhibitors)
- anti-testosterone treatment for prostate cancer.

Oestrogen Read up

Lack of oestrogen

- Oestrogen is important for women to maintain good bone health
- Lack of oestrogen can lead to lower bone building (accrual) and an increase in bone reabsorption

Why ?

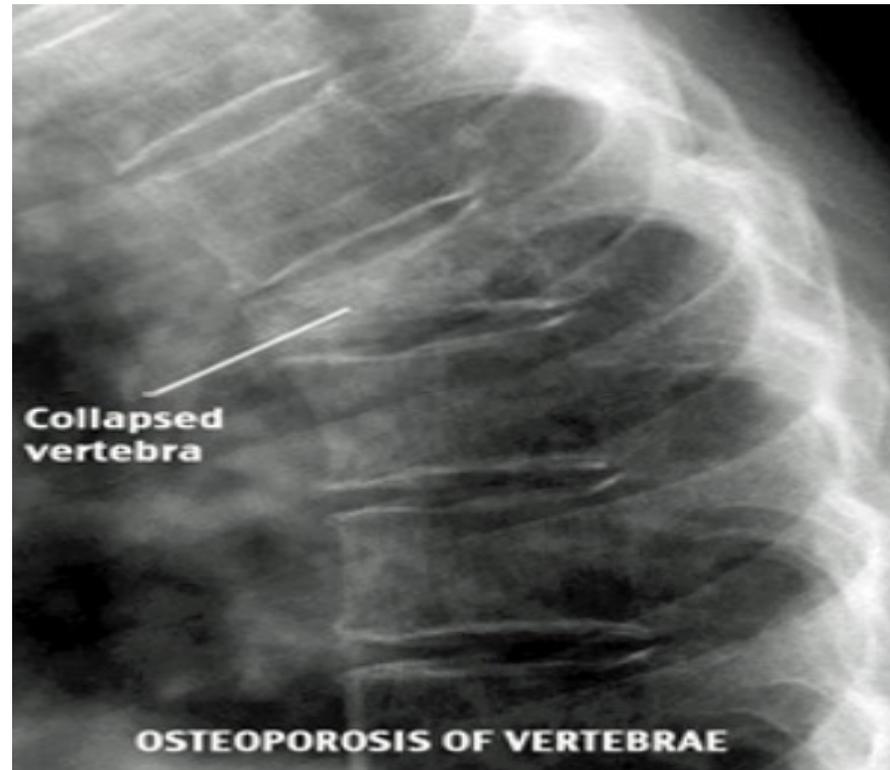
- Menopause
- Early hysterectomy
- Progesterone only contraceptive pill
- Female athlete
- Anorexia
- Orthorexia
- Bulimia – purging by exercise

So what

Osteoporosis sufferers may develop significant illness, deformity and sometimes death from **this condition.**

With thanks to Family GP On line

Thoracic crush fractures



How do we know?

Fractures

Dexa Scan

Bone density scanning, also called dual-energy x-ray absorptiometry (DEXA) or bone [densitometry](#), is an enhanced form of [x-ray](#) technology that is used to measure bone loss. DEXA is today's established standard for measuring bone mineral [density](#) (BMD).

With thanks RadiologyInfo.org

Bone Markers

- Urine test Deoxypyridinoline
- Blood tests

What they look like

DXA / DEXA peripheral



DXA / DEXA Machine central scanner



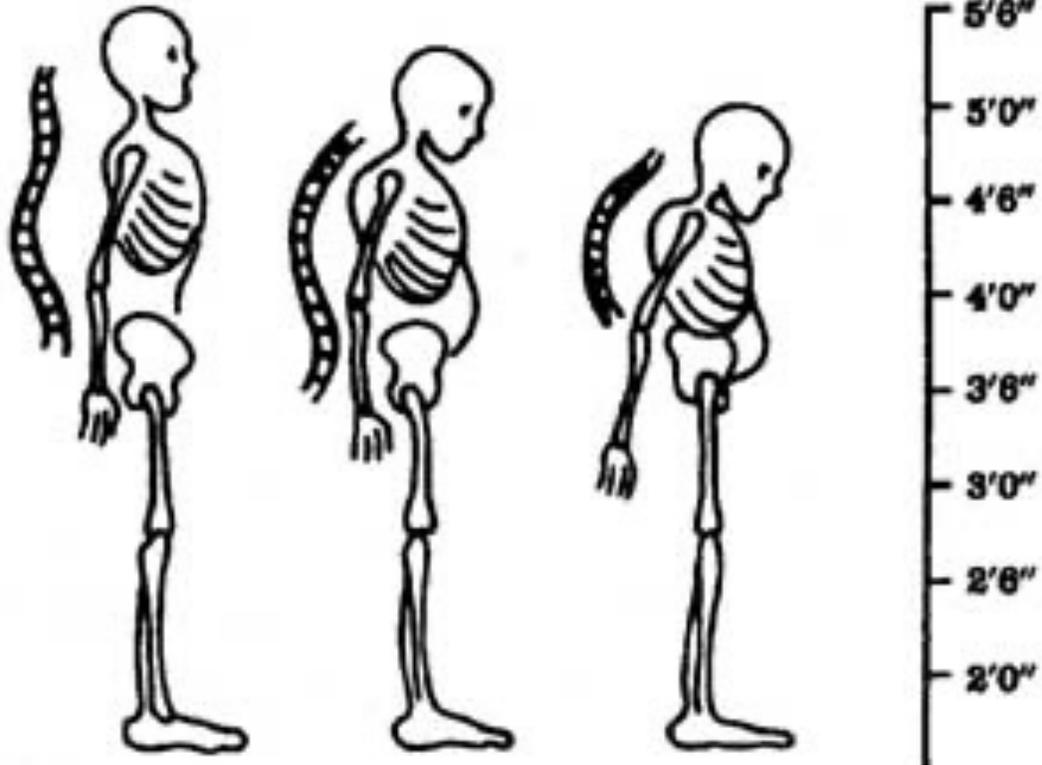
Whilst these machines measure BMD these machines give us limited information on bone quality and strength

© SpineSafe – Cherry Baker Education

T - Score

- **T score** — This number shows the amount of bone you have compared with a young adult of the same gender with peak bone mass. A score above -1 is considered normal. A score between -1 and -2.5 is classified as [osteopenia](#) (low bone mass). A score below -2.5 is defined as osteoporosis. The T score is used to estimate your risk of developing a fracture.
- **Z score** — This number reflects the amount of bone you have compared with other people in your age group and of the same size and gender. If this score is unusually high or low, it may indicate a need for further medical tests.
- Small changes may normally be observed between scans due to differences in positioning and usually are not significant.

Osteoporosis



40 years

60 years

70 years



Statistics

Approximately 30% of women over the age of 65 are Osteoporotic

70% of women over the age of 75 will have osteoporosis

(National Society for Osteoporosis)

Men over the age of 50 chances of developing osteoporosis are higher than developing prostate cancer

1 in 3 women and over 1 in 5 men over 50 will experience osteoporotic fractures.

Men over 80 are offered prostate checks but not osteoporosis.

FACTS

- In Europe it is estimated that women over the age of 45 spend more time in hospital due to osteoporosis than from heart attacks or breast cancer.
- Disability in Europe from Osteoporosis is greater than from rheumatoid arthritis, asthma or high blood pressure related heart diseases
- By 2050 it is estimated that hip fractures in men may increase by 310% and women by 240% compared to 1990
- Hip fractures have a mortality rate of up to 24% in the year following the fracture
- In the UK 1 in 2 women and 1 in 5 men over 50 , suffer from osteoporotic fractures

The Good News!

- Physical activities can improve balance and muscle strength, which reduce the risk of falling
- Weight-bearing and Resistance activity's (strength training) can strengthen the bones and reduce the risk of fractures

MEDICATION

DIET & EXERCISES

can actually improve T Scores !!!



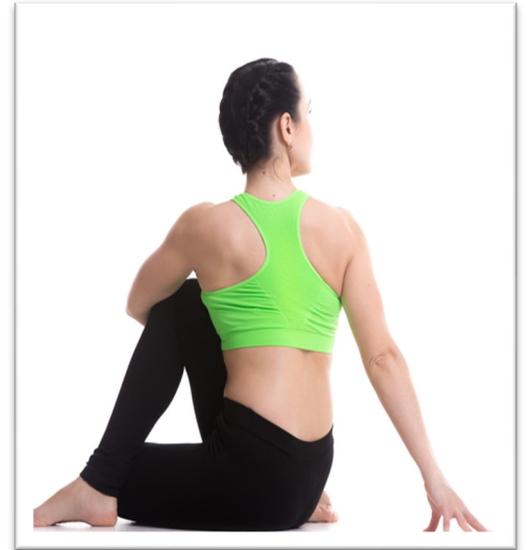
Osteoporosis and Exercise

- Increase muscle strength and power
- Increased bone density
- Improve everyday function
- Reduce fatigue and risk of falling
- **Choose appropriate exercise**
- Whole body approach and targeted fracture sites



What should we avoid or adapt ?

- Laying on foam roller ? Adaptations using roller - caution due to the risk of fracture, especially in the Kyphotic spine
- Avoid fixed rotation
- Avoid weighted lateral flexion
- Reduce ROM on fixed rotation or allow pelvis to follow ribs
- Avoid loaded thoracic flexion
- Avoid neck hyperextension
- Avoid any hinging in extension or rotation
- Long distance running on treadmill
- End range hip movements – reformer ?
- Poor technique



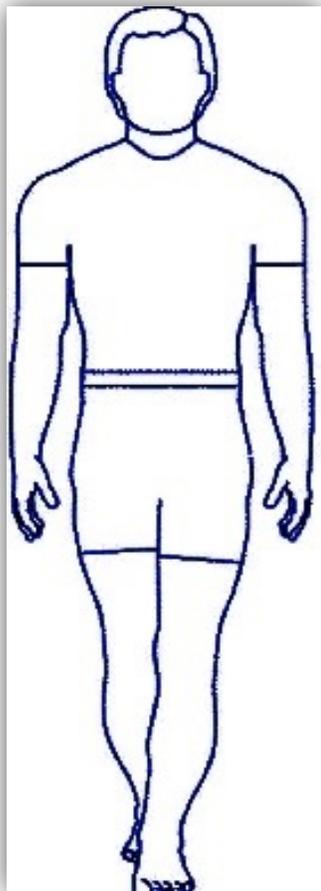
Let's discuss

Solutions:

- Weight bearing, weight resisted exercises - increased weight - less reps
- Target vulnerable fracture sites - wrist - hips - spine
- Appropriate exercise selection to reduce risk of injury and improve bone density
- More care with transitions



Balance exercises:



One leg standing

- An inability to stand on one leg for more than 10 seconds or inability to squat to the floor in postmenopausal women is strong prediction or indicator of hip fracture (ASBMR)
- Balance exercise such as one leg standing (unipedal) can be included in every day life or included in workouts etc.

Why does it work?

- Muscle pull on bone
- Weight training places stress on the bone stimulating bone forming cells



Considerations:

- Can they go to the floor?
- Extra mats
- Pillows for head if needed
- Turning over
- Transitions
- **Spotters** for passing weights to avoid compromising spine in transitions



- Risk of fall – do they need support?



What's wrong with this exercise ?

- Balance

So what exercise should we do ?

- Gradual progression
- Tailored to the individual
- Extension Bias
- Stability
- Strength training
- Balance
- Correct squatting and lifting techniques
- High resistance lower REPS
- Whole body approach
- Fracture sites



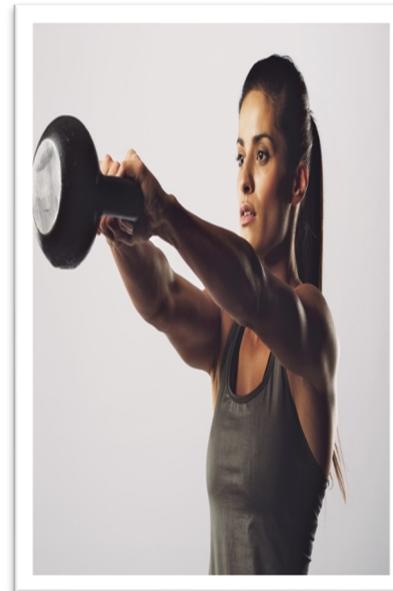
Cont.

- **Trunk stability** is important to strengthen supporting muscles
- **Good technique** in spine when squatting is important
- **Functional Exercise**
- **Bone strengthening /loading**



Weight Bearing

- Smith et al, 1994 3x 45 min per week = 1.4% increase in BMD over three years
- Krolner et al. 1983 2x1hr per week =3.5% increase BMD of the lumbar spine
- To elicit an osteogenic effect the load should exceed that used during normal daily activities

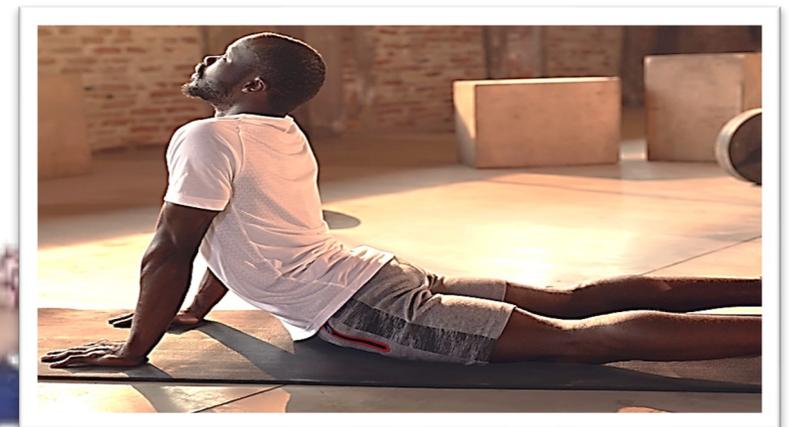


Extension - Workshop

- Increased Kyphosis and possible increased lordosis means segmental movement is restricted
- Observe movement originates from the thoracic area
- Avoid hinging in spine or excessive lumbar extension
- Any other exercises you wish to discuss? Let's refer to your list...



With thanks to Active Pilates Solutions



Workshop - Cardiovascular

The ok guys:

- Cycling (better when you stand)
- Swimming
- Performance of the same exercise without variation over long periods of time

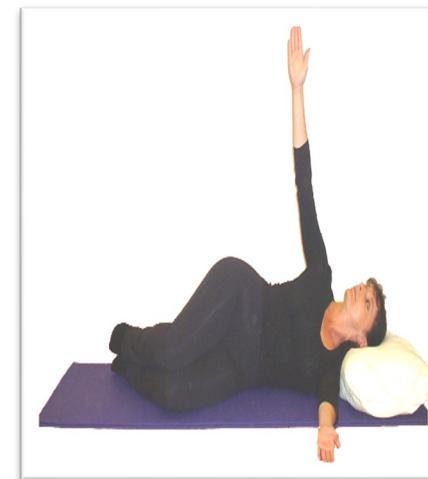
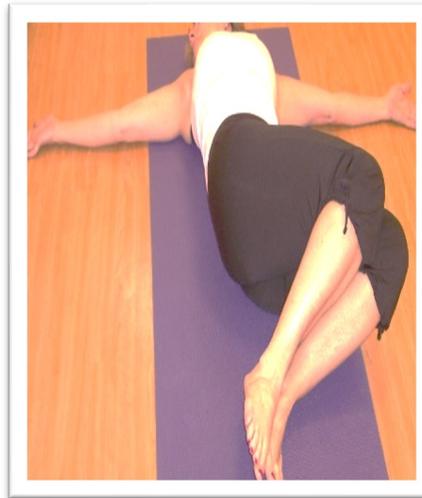
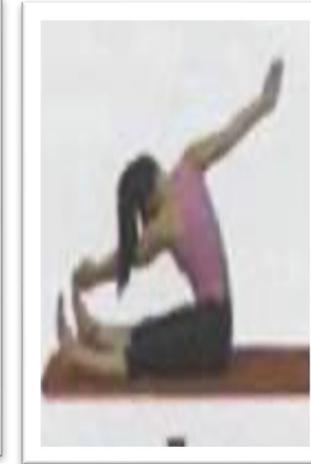
The good guys:

- Walking ? Various terrain
 - *M St James 208*
- Shorter walks weighted vest
- Changing the walk or direction every six weeks
- Hiit - healthy bones Australia
- Bouncing – light - medium impact
- Jumping with rest phases – discuss

**Any other exercises you wish to discuss ?
let's refer to your exercises.....**

Workshop -Spinal rotation

- Why should we adapt?
- How do we adapt?
- Can they straighten up before rotation?!
- Do they have any scoliosis?
- Let's refer to your exercises...



Workshop – lateral flexion



Why should we modify ? How can we modify ? Any other exercises you wish to discuss ? lets refer to your exercises...

Exercise Prescription one size doesn't fit all.....

- T – Scores
- Posture
- Individual ability
- Frail client - may not be able to go to the floor
- Active older adults
- Illness
- Active adults
- Over active adults

Workshop - Go back to your initial chosen exercise

How would you modify your exercise for a client with Osteoporosis ?

Sarcopenia

- Can we just mention this
- Start small - aim big!



How could this be made safer and more effective ?

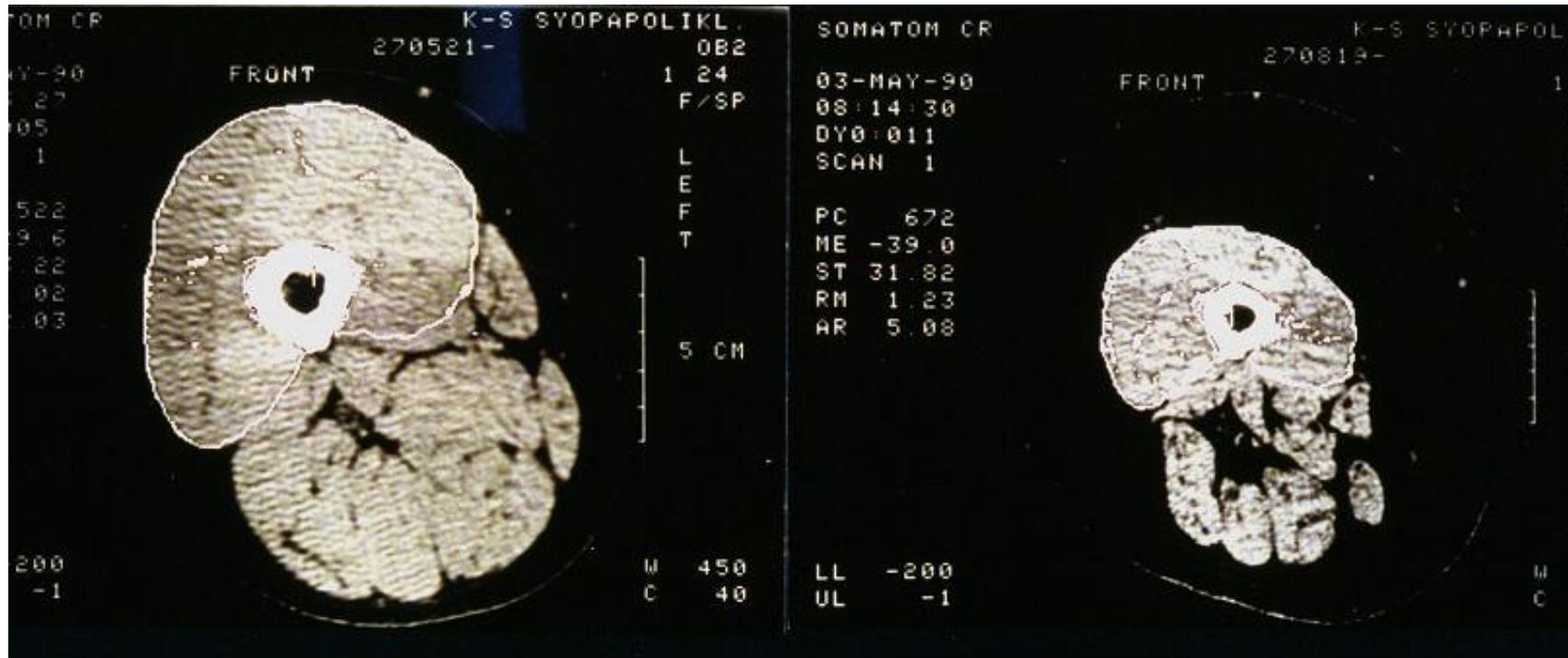
THE CONCLUSION Osteoporosis

– Active, Strength Trained vs Sedentary

70 yr old Female

Active, strength-trained

Sedentary



The same size difference is seen between 30 yr. old and 80 yr. old

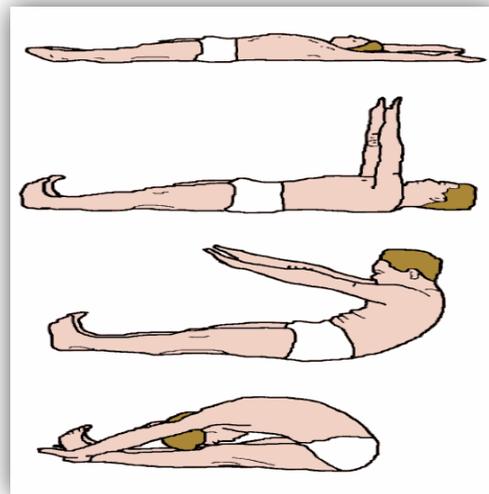
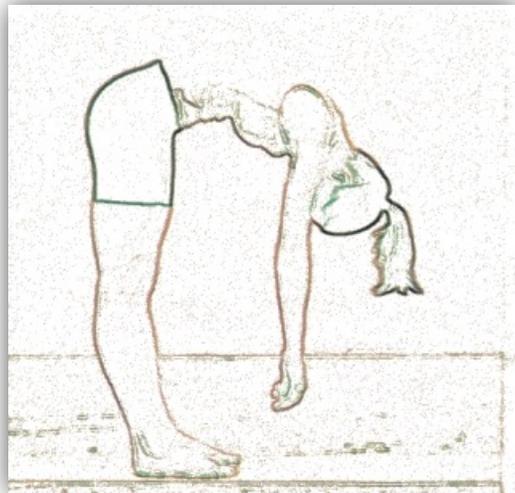
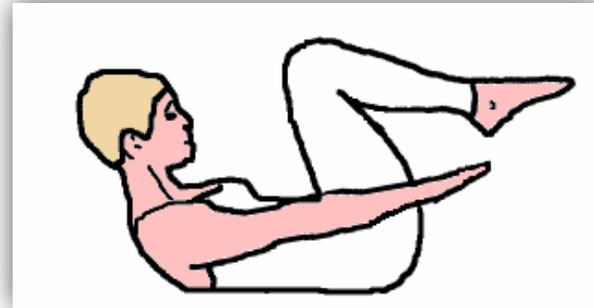
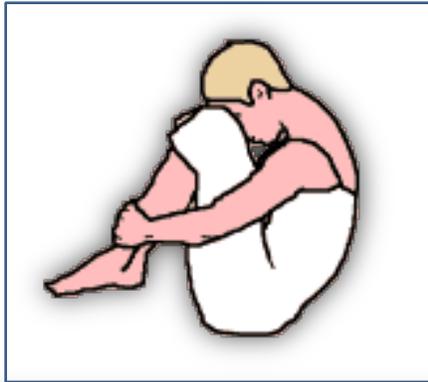
When is exercise too much....

- Exercise and bone loading ,the evidence shows this can increase bone density in most subjects (medication and diet and lifestyle factors being an issue)
- However too much exercise – energy deficiency and menstrual dysfunction can contribute or cause bone decrements
- Eating disorders
- Orthorexia
- Bulimia – over exercise



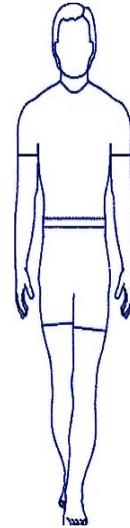
Osteoporosis Don'ts Pilates Examples

With thank to SpineSafe Pilates

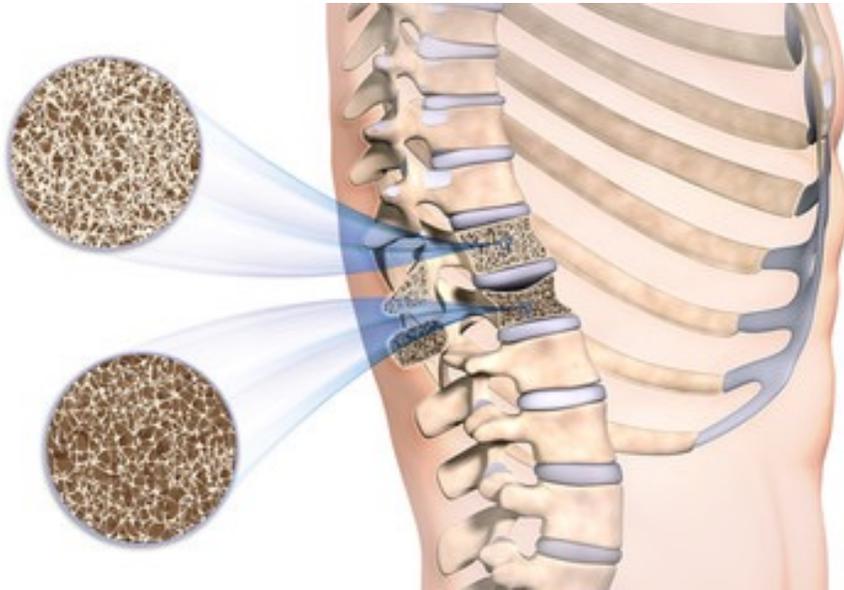


Evidence:

- 2006 – sakamoto K Journal of orthopaedic science
- One leg standing for one min increased the weight load on the femoral head of the hip more than 52 mins of walking.



The Four Hour Rule



- A study of people recovering from spinal injury from osteoporosis
- Results shows standing longer than 2 hours after recovery shows an increase in bone density but not in groups standing for shorter period of time

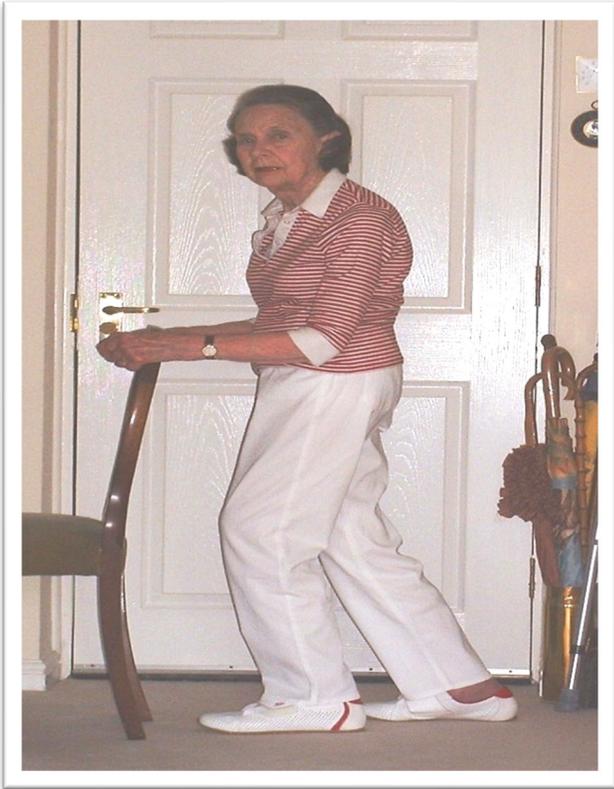
Ahmet salim goktepe MD et al
Journal of spinal cord me. 2008

REMEMBER...

IF IN DOUBT - REFER OUT!



Osteoporosis & Exercise



(with thanks to Later life training and the National Society for Osteoporosis)

