Rehabilitation in Osteoporosis

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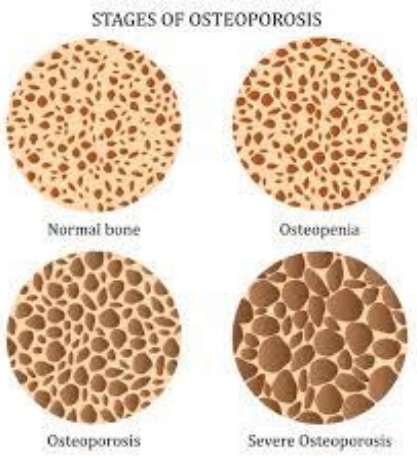
Importance of osteoporosis is purely in its relationship to fracture risk



The National Osteoporosis Foundation estimates that 50% of women and 25% of men over age 50 will experience an osteoporotic fracture

Women are four times more likely to develop osteoporosis than men

Average bone loss in women during menopause is approximately 2% each year, yet it is possible to lose up to 20% of bone in the 5 to 7 years after menopause

Prevention of Osteoporosis

- Prevention of osteoporosis should be a lifelong concern for both women and men, particularly those who exhibit controllable risk factors.
- The National Institute of Arthritis and Musculoskeletal and Skin Diseases states that up to 90 % of peak bone mass in women occurs by age 18 and in men by age 20
- Although bone mass is determined largely by genetic factors, other influences including vitamins, diet, exercise, and lifestyle can significantly influence bone health.

During growth, mechanical loading is critical for developing weight bearing bones, but after full skeletal development has been achieved, exercise help maintaining bone strength and prevent bone loss

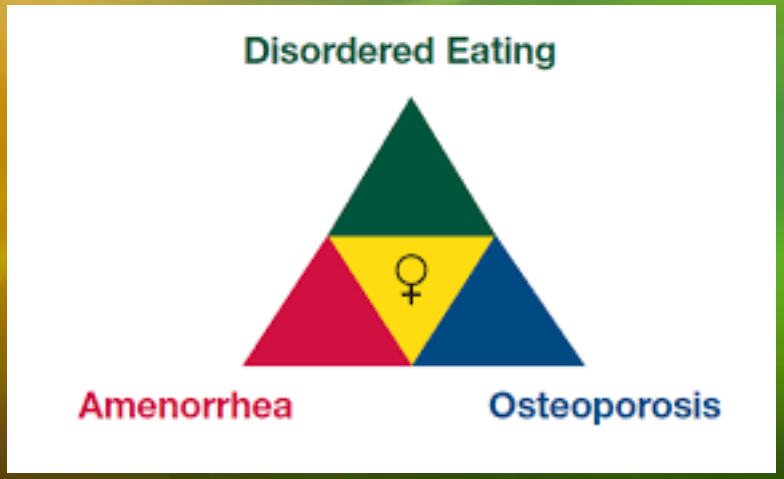
- **Common exercises**

Walking , Stair climbing	Aerobic jumping
Team sports	Swimming , Cycling
Balance & postural training	Stretching .E

Based on individual goals of the patients and baseline BMD, some forms of exercise are safer and more appropriate for individual patients.

Individuals with normal BMD can perform high-impact exercises, such as aerobics, jogging, and skiing. For persons with osteoporosis, non- straining exercises are recommended, such as walking for 45 minutes three times a week or for 30 minutes daily.

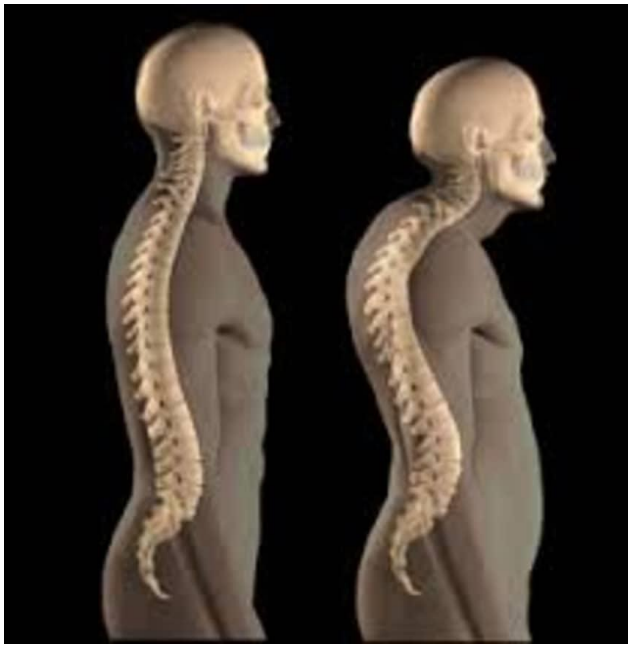
Female athlete triad



Osteoporotic fractures

Spinal fx :

most frequently non traumatic or due to minimal trauma



two-thirds of vertebral compression fractures are subclinical

A 10% loss of bone mass in the vertebrae can double the risk of vertebral fractures

A prior fracture is associated with an 86% increased risk of any future fracture.

Thracolumbar fractures may decrease the volumes between the ribs to the pelvis(costoiliac friction)

alter abdominal anatomy, crowd internal organs, causing gastrointestinal complaints such as premature satiety, reduced appetite, abdominal pain, constipation, and distention)

Two common reason for geriatric kyphosis are sarcopenia & osteoporosis

Kyphotic postural change is the most psychologically damaging effect of Osteoporosis

The majority of compression fractures are stable

where anterior wedging becomes more pronounced and involves 50 % or greater vertebral body height loss, disruption of the posterior longitudinal ligament, and vertebral dislocation,these fractures would then be considered unstable ,and warrant surgical intervention to prevent cord Compression

Management of Acute back pain in osteoporosis

- Bed rest (2 days): Substantial bone loss is not likely to occur with 2 day of bed rest
- Analgesics: Avoid constipating medicines, such as codeine derivatives
- Avoidance of constipation
- Physical therapy: Initially cold packs, then mild heat and stroking massage
- Avoidance of exertional exercises
- Knowledge of lifting and standing principles to avoid excessive spinal strain
- Back supports to decrease pain and expedite ambulation
- Gait aids if needed

Acute compression fx should be managed properly , otherwise can lead to prolong immobility .The final outcome is creation of chronic pain behavior and subsequent psychological consequences.

Taylc

Thoracolumbosacral orthoses (TL

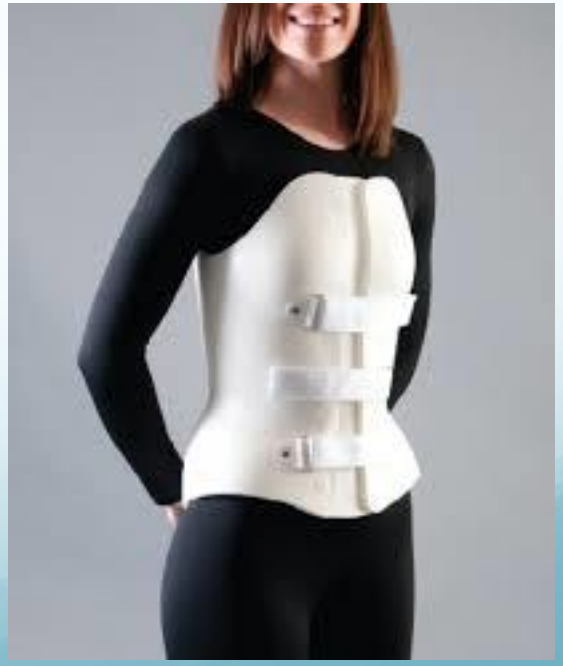
Extend further and typically consist of rigid thermoplastic custom-molded anterior and posterior shells secured by velcro straps and may be used especially for more severe or multiple fractures. Rigid orthoses are commonly worn for 6 to 8 weeks and then slowly withdrawn.

- Contraindication in unstable fractures

TLSO

Rigid orthoses can not be tolerated

by most of osteoporotic people



Semirigid Orthoses are used for both for acute and longer term treatment.

spinomed

The Spinomed consists of a lightweight padded metallic back pad which can be molded by hand to be in contact with the spine

They provides proprioceptive feedback about posture in all directions

W.K.O

(Posture training support)

The WKO consisted of a fitted harness with 1 kg of weight suspended on the spine between T10 and L4.

use of a WKO and back exercise increased back strength more significantly ($P < 0.02$) than back exercise alone.

Posture training programs, such as the application of a WKO for 20 minutes two to three times a day

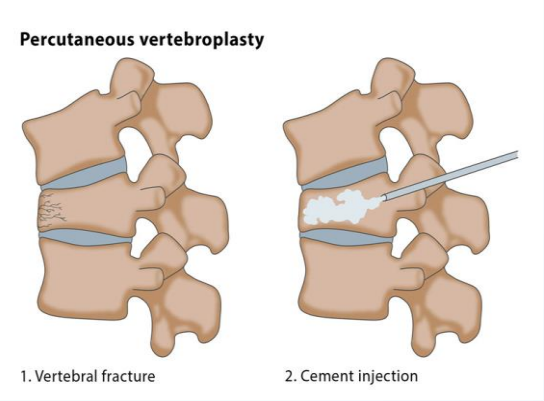
can provide reeducation of the paraspinal muscles for improvement of kyphotic posture and reduction of the risk of falls (Dr. Sinaki et al)

Back Extension & stretching /strenghtening exercises

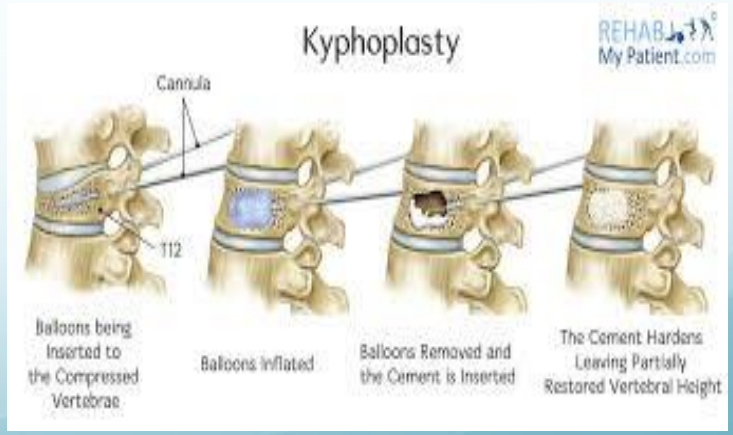
Balance Training Exercises

For patients who have intractable pain despite medication , bracing, and rehabilitation strategies,and can not undergo surgery , per cutaneous fracture stabilization with polymethyl methacrylate (PMMA)

Could be done



Vertebroplasty :Direct injection of PMMA into a collapsed vertebral body but does not restore vertebral height reduction



kyphoplasty :uses a balloon tamp to create a void in the bone and expand the vertebra, thereby correcting height loss

Management of Chronic Pain in Patients With Osteoporosis

Chronic spinal pain can be attributable to the deformity caused by vertebral wedging and compression, as well as strain of ligaments

Improve faulty posture; may need weighted kypho-orthosis

Manage pain (ultrasound, massage, or transcutaneous electrical nerve stimulation)

Prescribe a patient-specific therapeutic exercise program

Start appropriate pharmacologic intervention

Hip Fracture

Hip fx is the most important fragility fracture because of considerable morbidity & mortality and great costs

Hip fx are primarily caused by fall on lateral position

Delays in fracture treatment of more than 24 hours are known to increase mortality in the elderly

postoperatively, the patient is made partially weight- bearing (10 %) for 4–6 weeks, depending on the degree of stability. Rehabilitation begins by R.O.M , weight bearing & strenghtening exercises

Whole body vibration (20-40

Whole body vibration

Whole body vibration (WBV) exercise is a forced oscillation that transfers energy from a vibration platform to the body

A few Trials showed improvements in lower extremity muscle strength, BMI, pain, balance & BMD

WBV platforms have not been approved by the FDA for medical purposes.

Disadvantages of the therapy include unknown long-term safety considerations and out-of-pocket costs to the patient. Vibration may result in loss of balance and vestibular dysfunction. Moreover the vibratory effect may compromise postoperative spinal stability or recent cataract surgery.

Fall prevention

Appropriate assesment of :

poor vision

decreased cognition

dizziness

Medication ,particularly sedatives & anti hypertensives

Good lighting of rooms

Wearing supporting shoes

Avoide of clutter & aware of tresholds

Slippary floor & rugs

Gait Aids

Landing on the buttocks is less traumatic to hips than landing on the greater trochanters.

Hip protector


Thanks for your attention