

# Frailty syndrom

Frailty- weak bone, prone to fracture

1. Loss of body weight 4-5 kg/year
2. Exhaustion
3. Low muscle strength / handgrip 20 %
4. Low velocity of gait 20 %
5. Diminished physical activity 20 %

# Frailty syndrom

Subclinicaly

Early frail

Late frail

Endstage frailty syndrom: terminal geriatric deterioration

# Frailty syndrom

Tendency to falls and to fractures

Tendency to decompensation of other comorbidities

Loss of cognitive functions

Help in daily activities

Sarcopenia

Osteoporosis

Bone density corelates with serum level of vit D

Low level of vit. D corelates with loss of cognitive functions

# Prevalence

Mostly in higher age

In 7 % of people above 65 y. living at home

In 25 % of people at the age above 75 years

Loss of muscles of 20 % in people 65-70 let

Loss of muscles of 60 % in people above 80 years

The cause: long lasting insufficiency of vit D

# Risk factors of frailty syndrom

Cardiovascular diseases

Diabetes mellitus

Atherosclerosis

Renal diseases

Neurological diseases

Obesity

Hormonal dysfunction

Parkinson syndrom

Multiple sclerosis

Condition after cerebrovascular disease

Cataracta

# Prevention and treatment of frailty syndrom

Frailty syndrom is reversible

Nurishment and uptake of proteins 1,3 g/kg/day

Vit D 800 IU/day till 2000 IU/day

Vigantol 1 drop = 500 IU, alpha kalcidol 1 µg

Walking, resisted exercise for maintaing of muscle strength

Exercise for balance and stability

Prevention of atherosclerosis, management of metabolic diseases

Mangement other comorbidities

To relieve of pain

Stop walking when talking

# Sarcopenia

Loss of muscle material of 20-30 %

Dysbalance between synthesis and degradation of muscles  
(myostatin, glucocorticoids, sexual hormones, insulin, IGF-I )

Osteopenia follows sarcopenia

Bedridden patients

Sedentary way of life

Worsening of physical condition

# Sarcopenia

Muscle densitometry: bellow 2 SD - male      bellow 7,26 kg/m<sup>2</sup>  
- female bellow 5,45 kg/m<sup>2</sup>

MRI examination

Hand grip- dynamometer

Flexion and extension of knee joint

Maximal rate of breathing out

Velocity of walking

Test for maintaining of balance

Get up and go test

Test of climbing stairs



# Consequences of sarcopenia

Diminished physical activity

Sarcoporosis

Higher risk of falls

# Medication in sarcopenia

Vit D 800 IU/day till 2000 IU/day

Vigantol 1 drop = 500 IU

Alpha calcidol 1  $\mu$ g

Testosteron

Ghrelin

Leptin

Growth hormon secretogoga

Estrogens

# Management

Farmacotherapy of osteoporosis diminished the risk of fragility fractures only in 20-50 %

The whole patient with osteoporotic syndrom

- + frailty syndrom
- + sarcopenie
- + osteoarthrosis
- + other comorbidities

Prevention of falls



# Physiotherapy



# Medication for osteoporosis

## Bisphosphonates

- Alendronate (Fosavance)
- Risedronate (Actonel)
- Ibandronate (Bonviva)
- Zoledronate (Aclasta)

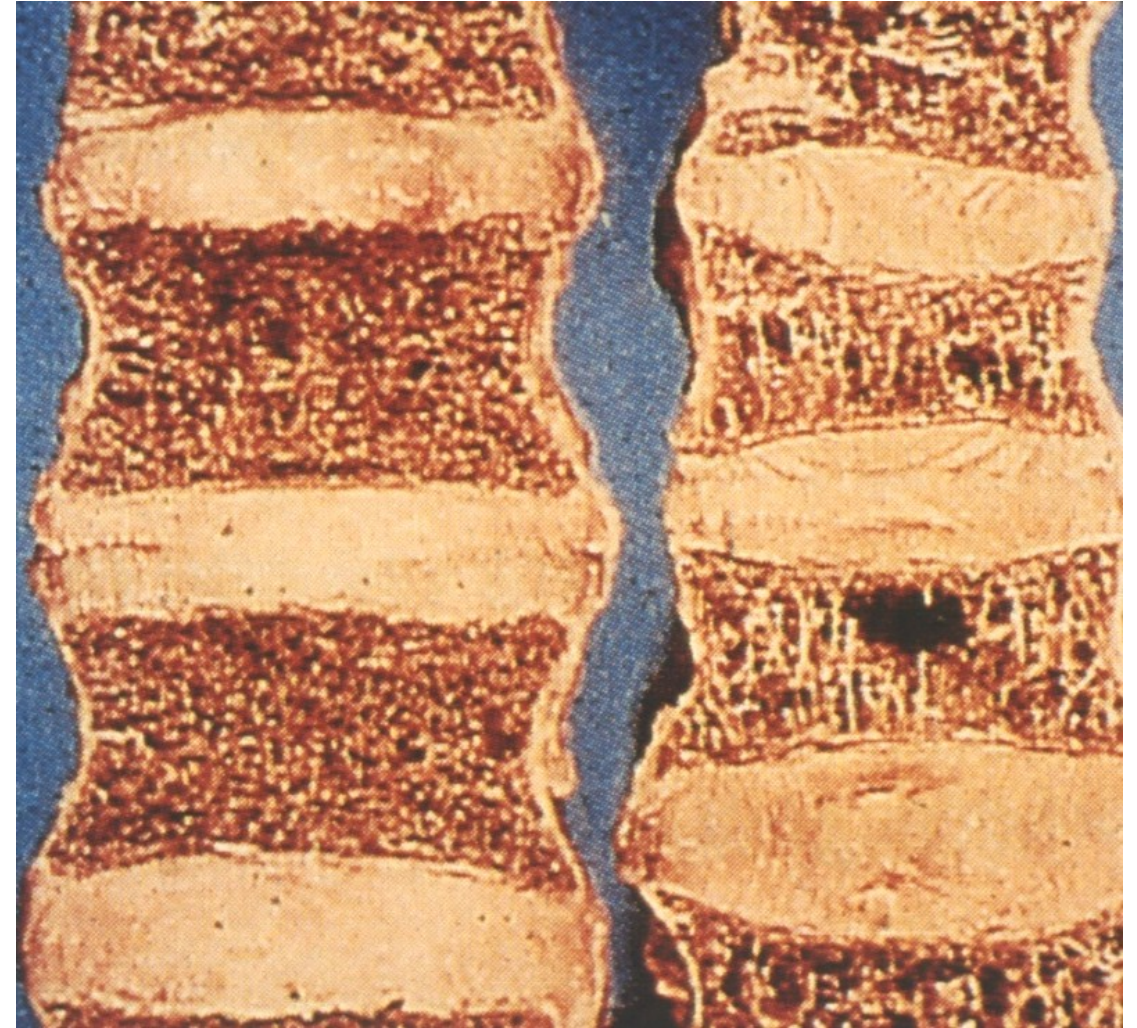
## Denosumab (Prolia)

## Stroncium ranelate (Protelos)

## Parathormon, teriparatid

– synthetic parathormon 1-34 fragment  
(Forsteo)

## SERM- bazedoxifen



# New agents

Sclerostin antibodies

Sclerostin – inhibitor of osteoblasts

produced by osteocytes

Romosozumab

Blosozumab

Inhibitors of katepsin K

- inhibit bone resorption

Odanatocibe