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What is Osteoporosis?

“A skeletal disorder characterized by compromised bone strength predisposing a person to an increased risk of fracture. Bone strength reflects the integration of two main features: bone density and bone quality”

(US National Institutes of Health)



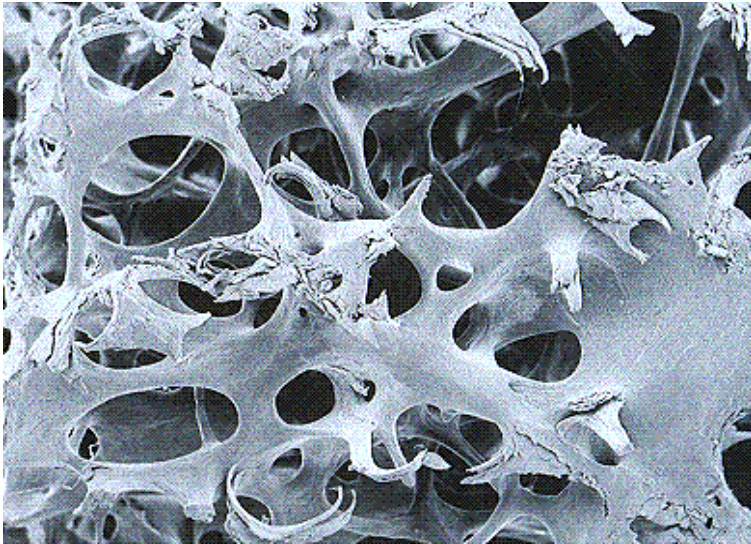
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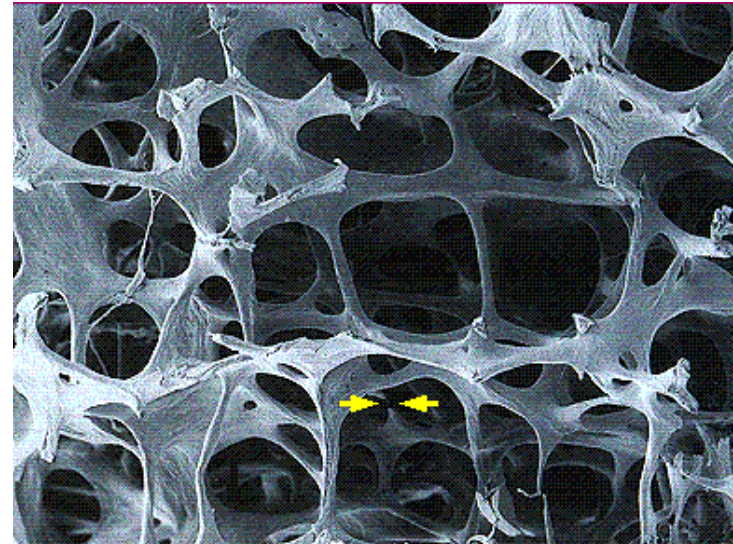


What is Osteoporosis?

Normal



Osteoporosis
(porous bone)





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What is Osteoporosis?

Is called the “silent thief” because there are no symptoms of bone loss. Bones become gradually weaker and cannot stand a force or pressure, and a break may occur.



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What is Osteoporosis?

Fractures to the wrist, spine and hip are the most common

Wrist



Spine



Hip



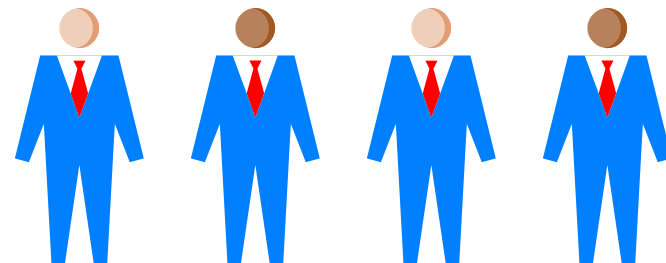
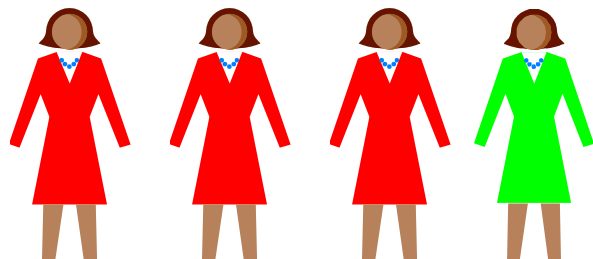
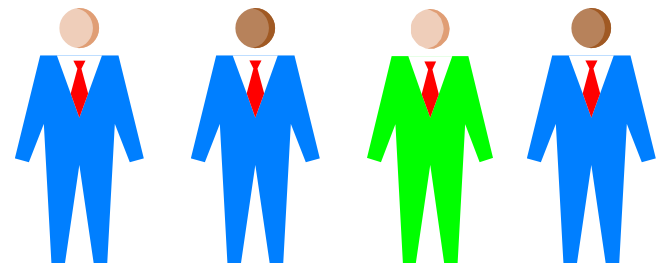
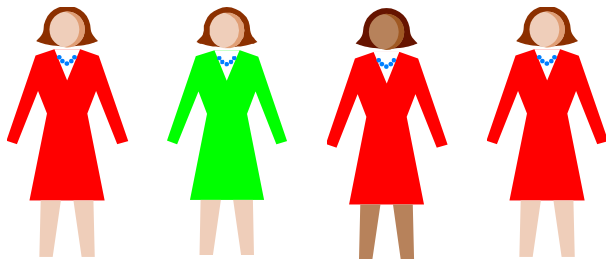


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Prevalence of Osteoporosis



1 in 4 women

1 in 8 men



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Prevalence of Osteoporosis

- Effects an estimated 2 million Canadians
- Is a major public health concern due to an aging population
a consequent increase in hip fractures

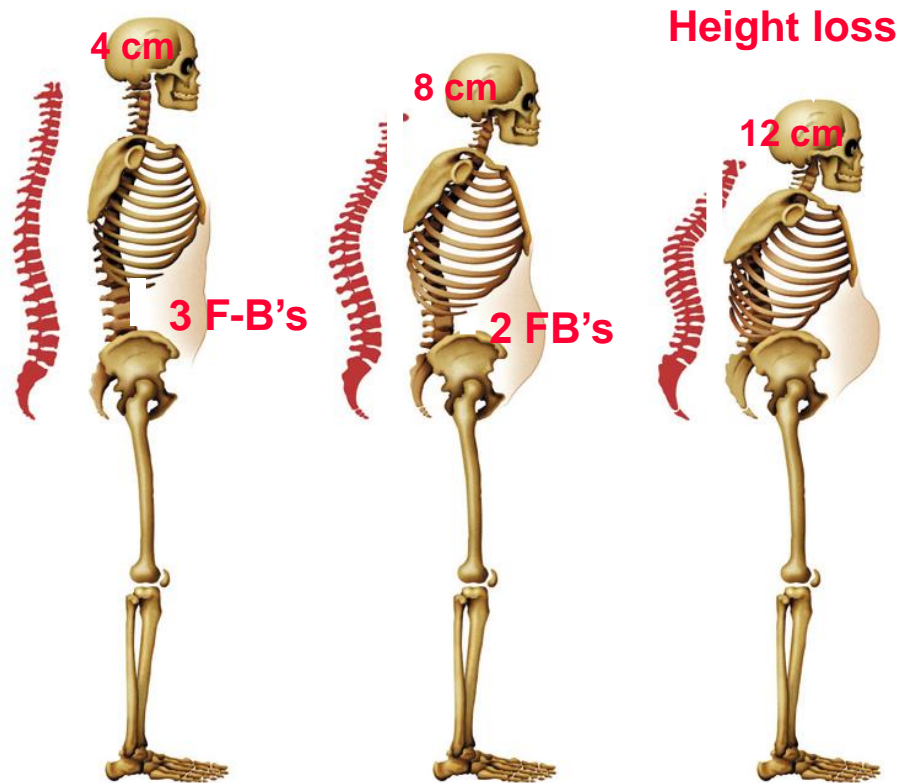


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Impact of Osteoporosis





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Impact of Osteoporosis

- Approximately 25,000 hip fractures each year in Canada (70% are osteoporosis related)
- 1 in 4 people with a hip fracture will die within a year, 1 will return to independent living and 2 will require assisted living
- Approximately 27% of hip fractures occur in men



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Impact of Osteoporosis - Men

- Fewer men sustain fractures
- Mortality associated with hip and vertebral fractures is higher in men
- 2 studies show 1 year post hip fracture mortality for men is 31%, women 17%



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Impact of Osteoporosis

- Osteoporotic fractures cost the healthcare system over \$1.3 billion
- Acute care costs over \$465 million
- Majority of costs due to hip fractures
- \$842 million for LTC and chronic care
- 2018 – predicted cost at \$32.5 billion

Goeree et al. SOGC 1996;(Suppl):15



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Bone Health

- Bone is constantly being renewed, with old bone being removed and replaced by new bone
- Until early adult years new bone is added to the skeleton faster than old bone is removed
- Peak bone mass in females = 16 years and in males = 20 years
- After age 35, bone removal takes place faster than bone replacement

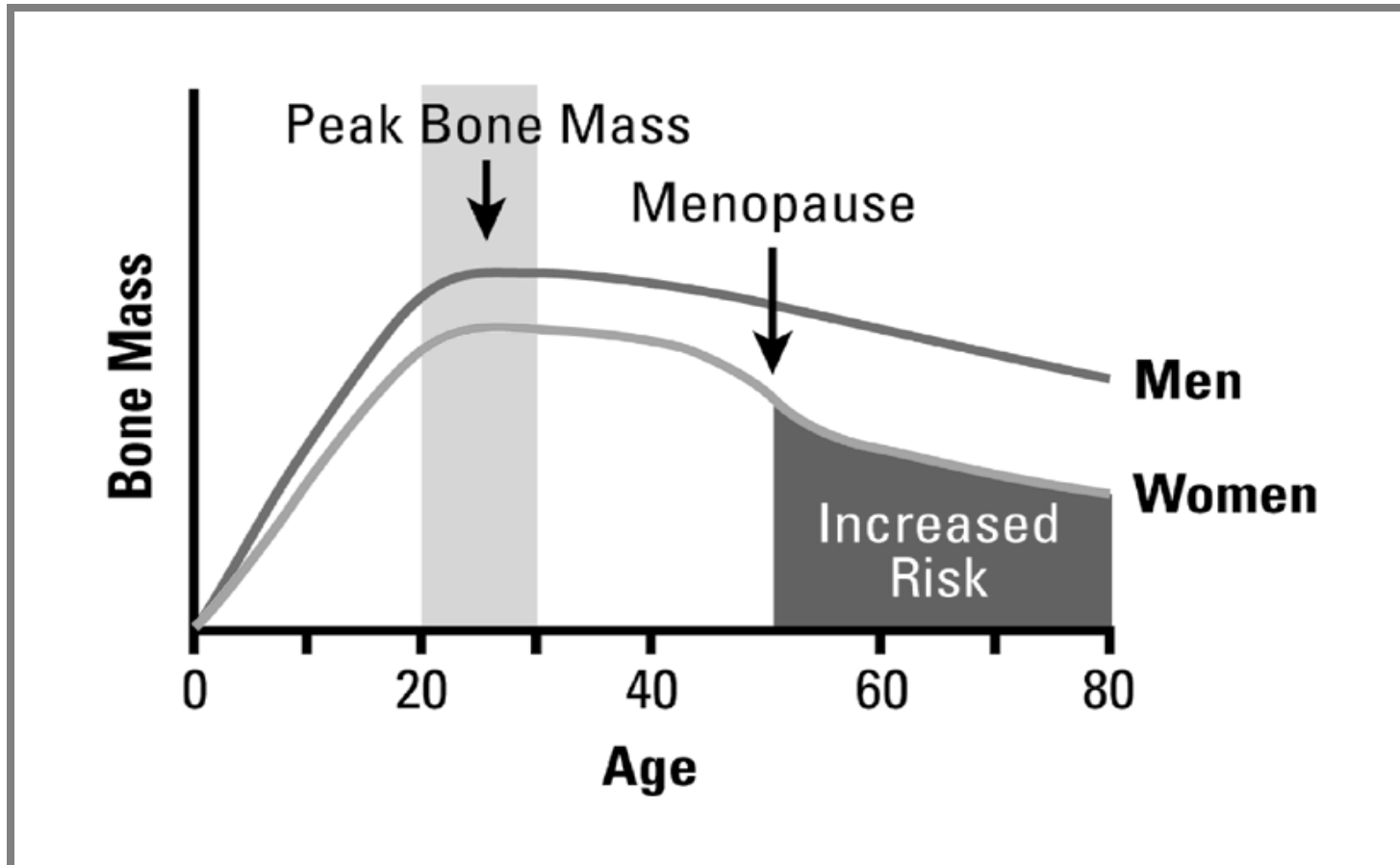


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Bone Health





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Bone Health



Bone Loss

- Between 35 and 40 men/women lose .5 to 1.0 % bone mass per year
- At menopause the rate accelerates to 2-5 % per year
- Men slower but higher after 65



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Bone Health - Men

- Higher peak bone mass (10%)
- Greater bone size
- Greater bone mass
- Gradual andropause
- Physical activity
- Low incidence of falls
- Shorter life



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Factors that Effect Bone Health

- Genetics
- Hormones
- Nutrition
- Physical activity



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Genetics

- People who are related often have similar bone densities
- A family history of osteoporotic fractures puts you at increased risk of having them



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Hormones

- Hormones like estrogen, progesterone and testosterone are important in maintaining bone density
- Decreased hormone levels can result in bone loss
- Hormonal shifts occur with aging



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Nutrition

- A well balanced diet
- Adequate amounts of calcium and vitamin D



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Nutrition

Calcium

<u>Age</u>	<u>Daily Intake</u>
Children (4 – 8)	800 mg
Adolescents (9 – 18)	1300 mg
Men & women (19 – 49)	1000 mg
Men & women (50+)	1200 mg
Pregnant or lactating women (≥ 18 years)	1000 mg



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Nutrition

Vitamin D

<u>Age</u>	<u>Daily Intake</u>
Men & women (19 – 50)	400 - 1000 IU
Men & women (50+)	800 - 2000 IU
Pregnant or lactating women (≥ 18 years)	400 - 1000 IU



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Physical Activity



Weight bearing activities

- Bones and muscles work against the force of gravity
- Examples include dancing, climbing skating



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Physical Activity

Resistance Exercises

- Involve moving objects or your own weight to create resistance
- Common forms of resistance exercises are weight-training with barbells, dumbbells, household objects or wrist weights
- Strength training with equipment in a gym or health club



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Physical Activity



Benefits

- Works with calcium & vitamin D to build strong bones
- Better coordination and balance – help with falls prevention
- Improved muscle strength and flexibility
- Increased endurance for daily activities
- Improved posture



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Physical Activity

Balance and falls prevention

- Postural exercises are also important for people with osteoporosis
- Exercise that improves balance will decrease falls as well as the risk of falls
- 1 in 3 seniors 65+ fall each year
- 1 in 2 seniors 80+ fall each year



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Assessment of Osteoporosis and Fracture Risk

- Fractures are the main health implication of osteoporosis
- Best assessed as 10-year Absolute Fracture Risk



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Assessment of Osteoporosis and Fracture Risk

Who should be assessed

- Women and men over 50 to identify those at high risk
- Anyone over 50 who has experienced a low trauma fracture



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Assessment of Osteoporosis and Fracture Risk

How the assessment is done

Detailed history to identify risk factors for low BMD, future fractures and falls:

- Prior low trauma fracture
- Parental hip fracture
- Glucocorticoid use
- Current smoking
- High alcohol intake (3 or more drinks per day)
- Rheumatoid arthritis
- Falls in past 3 months
- Review gait and balance



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Assessment of Osteoporosis and Fracture Risk

How the assessment is done (continued)

Physical examination

- Measure weight
- Screening for vertebral fractures
 - Measure height annually
 - Measure rib to pelvis distance
 - Measure occiput-to-wall distance
 - Spinal x-ray indicated if there is evidence of vertebral fracture
- Assess fall risk by using Get-Up-and-Go Test



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Bone Mineral Density (BMD)





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Bone Mineral Density (BMD)

Bone Mineral Density (BMD) Test

- Is a physician referred/ordered test
- Is safe, painless, non-invasive
- Uses Dual Energy X-Ray Absorptiometry (DXA)
- Measures the density of your bones The thinner the bones are, the more light will pass through.
- Important to use the same machine every time
- Hip and spine measurements most common



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Bone Mineral Density

Who should have a BMD Test

- All women and men 65 years or older
- Postmenopausal women and men 50 – 64 with risk factors for fracture
- Younger men or women (under 50) with a disease or condition associated with low bone mass or bone loss




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Osteoporosis Management

Goals

-  bone loss
- Maintain/increase bone density
- Reduce the risk of fracture



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Osteoporosis Drug Therapy

Slow bone erosion

Bisphosphonates include:

Etidronate (Didrocal)

Alendronate

(Fosamax, Fosavance)

Risedronate (Actonel)

Zoledronic Acid (Aclasta®)

RLI – Denosumab (Prolia™)

SERMs-Raloxifene(Evista)

Calcitonin (Miacalcin)

Speed up bone building

Parathyroid hormone (PTH)

Teriparatide (FORTEO®) *a daily subcutaneous injection for 18 months*



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Drug Therapy for Men

- Alendronate and risedronate are the recommended bisphosphonates for the treatment of osteoporosis in men
- Testosterone therapy improves bone mineral density (BMD) and may be beneficial for men with low levels of male hormones (hypogonadism)
- Parathyroid hormone therapy has also been shown to improve BMD in men



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Resources

- BT Education and information programme
- Bilingual Toll-Free Information Line 1-800 463 6842 (English) or 1-800 977 1778 (French)
- www.osteoporosis.ca
- Publications and dvds
- OC Chapters and Support Groups
- COPN (Canadian Osteoporosis Patient Network)
- Osteoblast Newsletter and Osteoporosis Update
- Clinical practice guidelines



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Questions?

Elizabeth Stanton
Toronto & Peel Area Manager
estanton@osteoporosis.ca

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