# Help, My frail Patient has Osteoporosis!

**Anna Byszewski MD MEd FRCP(C)**

**abyszewski@ottawahospital.on.ca**

**Professor, Faculty of Medicine,**

**University of Ottawa**

**Regional Geriatric Program of Eastern Ontario**

# Objectives

- Brief overview of osteoporosis
- Explain the importance of balancing risk and benefits of applying the guidelines for the diagnosis and management of osteoporosis in the frail elderly
- Discuss the diagnosis and management strategies for osteoporosis in the frail elderly
- Access and evaluate resources for the management of osteoporosis in the elderly in primary care

# Some important questions

- 1. When to STOP bisphosphonates - e.g. frail elder with diagnosed osteoporosis, on bisphosphonate x 5 or more years, high risk for falls, not much change in BMD in past 5 years.
- 2. To use calcium supplements, or not to use calcium supplements in those with osteoporosis and inadequate dietary calcium (won't drink milk or fortified OJ, eat cheese, yoghurt or canned sardines/salmon with bones). ... especially if they have known CAD
- 3. How to manage the patient with normal BMD, but clinically obvious kyphosis, and loss of height.

# Thank you from the Royal family!
## (Hip fracture and surgery at age 97)

# Shake your hips!

# Case 1

Mrs. B a 90 year old retired secretary, lives at home with daughter, history of several falls. BMI 18. Height loss of 6 cm.

**PMH:** PD, PUD, COPD, HTN, MCI

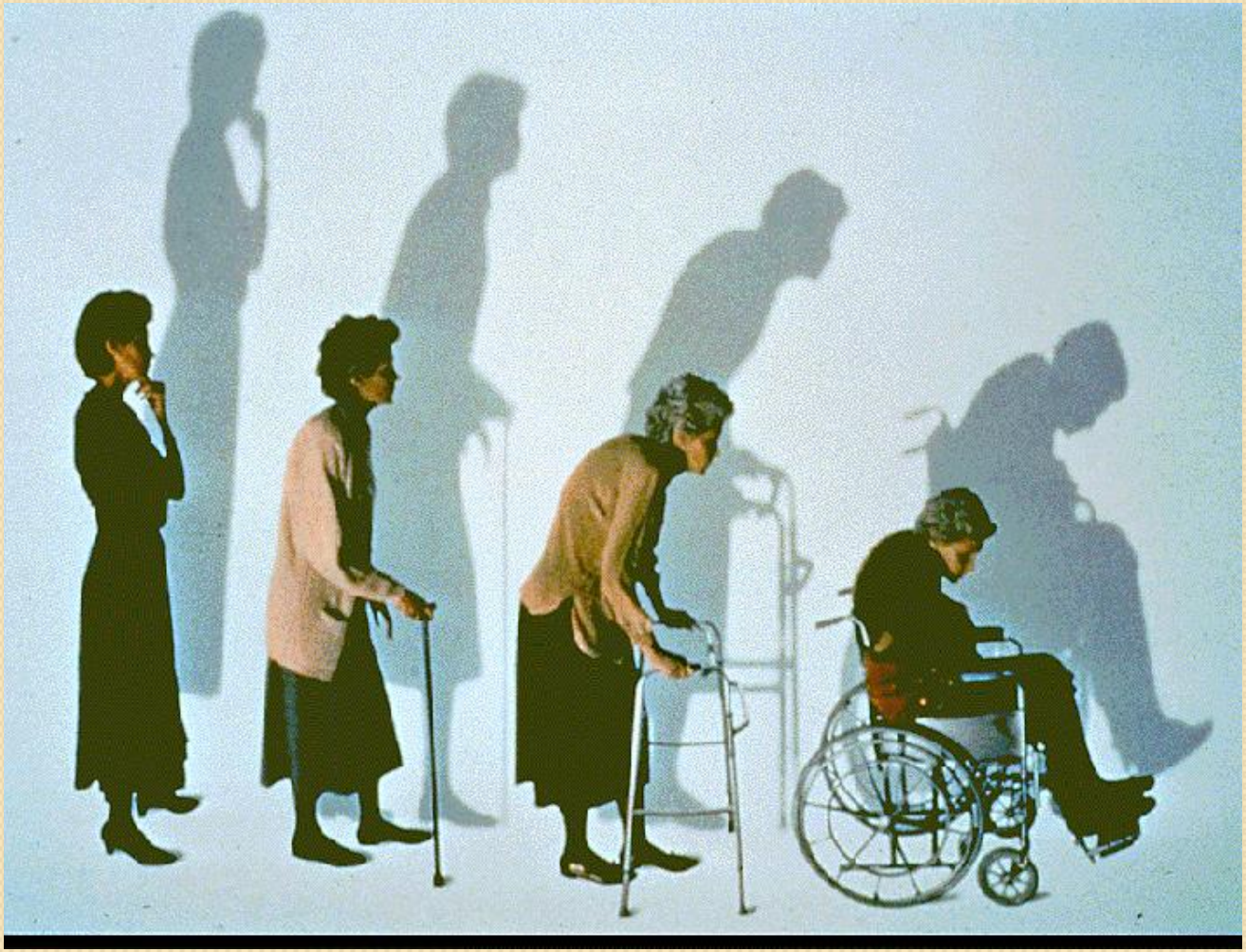
**Meds:** levodopa, trazodone, HCTZ

Presents with several falls.

***Daughter read about osteoporosis, asks you if her mother has OP?***

What do you do?

# Vertebral Fractures: The Domino Effect



# Can you see all the OP risk factors ?

# The Impact of Osteoporosis

1 in 4 Canadian women & 1 in 8 men have osteoporosis

- > 40% of women over 50 suffer fractures
- Risk of suffering a fracture > combined risk of heart attack, stroke, and breast cancer in women.
- Death from hip fx complications > death from breast & ovarian cancers combined

- **Consequences:**
  - 20% of women with a hip fracture die in 1 yr
  - 34% do not return to independent living
  - In hip fracture subjects over 65

    86.5% walked independently pre-fracture, only 53.9% could walk independently at one year

# Bone Facts

- Women build bone from birth until age 30-35 when they achieve peak bone mass
- Most women maintain peak bone mass until menopause
- They lose bone most rapidly in the first several years after menopause
- Increased life expectancy means we live many more postmenopausal years… that's many more years of potential bone loss

Often no symptoms – Silent disease:

- Fractures – wrist, spine, hip etc.
- Dowager's hump / kyphosis
- Height loss
- Respiratory and digestion problems
- P/E:
  - Loss of height (6 cms or more)
  - Less than 3 fingers space between bottom rib and top of hip.
  - Wall Tests - >6 cms from wall to back of head.

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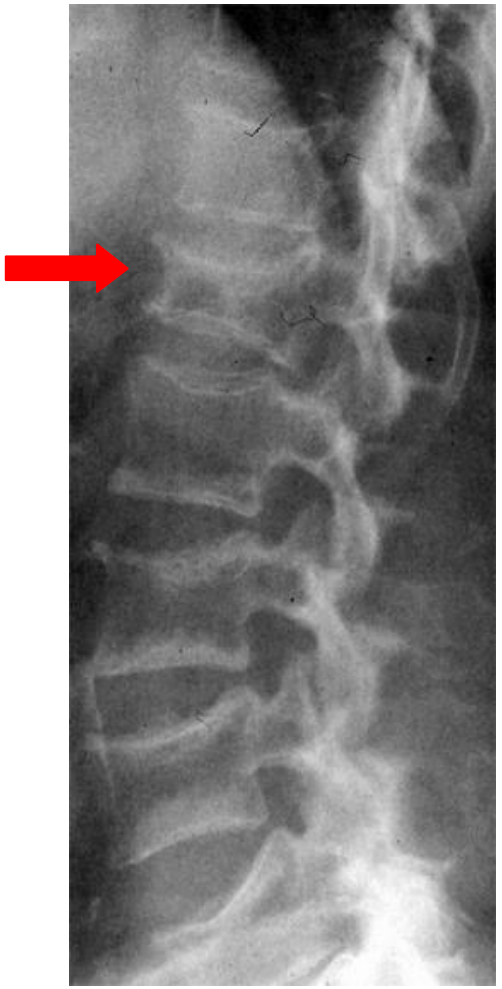
# Spinal fracturing:

- **Low trauma spinal fractures:**
- **60% are asymptomatic**



Hajcsar EE, Hawker G, Bogoch ER. Investigation and treatment of osteoporosis in patients with fragility fractures. Canad Med Ass J 2000; 163: 819 - 822.

# TOP 10 issues in Osteoporosis

# 1. When to order BMD

**Table 1:** Indications for measuring bone mineral density

| Older adults (age ≥ 50 yr) | Younger adults (age < 50 yr) |
|---|---|
| Age ≥ 65 yr (both women and men) | Fragility fracture |
| Clinical risk factors for fracture (menopausal women, men age 50–64 yr) | Prolonged use of glucocorticoids* |
| Fragility fracture after age 40 yr | Use of other high-risk medications† |
| Prolonged use of glucocorticoids* | Hypogonadism or premature menopause (age < 45 yr) |
| Use of other high-risk medications† | Malabsorption syndrome |
| Parental hip fracture | Primary hyperparathyroidism |
| Vertebral fracture or osteopenia identified on radiography | Other disorders strongly associated with rapid bone loss and/or fracture |
| Current smoking | |
| High alcohol intake | |
| Low body weight (< 60 kg) or major weight loss (> 10% of body weight at age 25 yr) | |
| Rheumatoid arthritis | |
| Other disorders strongly associated with osteoporosis | |

*At least three months cumulative therapy in the previous year at a prednisone-equivalent dose ≥ 7.5 mg daily.
†For example, aromatase inhibitors or androgen deprivation therapy.

# 2. How do I interpret the DXA WHO criteria

- Osteopenia: T score < - 1.00
- Osteoporosis: T score < - 2.5
- Severe osteoporosis: < - 2.5 with fractures

# 3. What is the relationship of BMD and fracture

- Osteopenia
  - risk of fracture doubles
- Osteoporosis
  - risk of fracture 4 - 5 fold increase
- Osteoporosis with pre-existing fracture
  - risk of refracture 20 fold increase

# Tools validated in Canada

- CAROC: Joint initiative of the Canadian Association of Radiologists and Osteoporosis Canada1
- FRAX: Fracture Risk Assessment Tool developed by the World Health Organization2

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2010 Guidelines

# 10-year Risk Assessment for Women (CAROC Basal Risk)

| Age | Low Risk | Moderate Risk | High Risk |
|---|---|---|---|
| 50 | above -2.5 | -2.5 to -3.8 | below -3.8 |
| 55 | above -2.5 | -2.5 to -3.8 | below -3.8 |
| 60 | above -2.3 | -2.3 to -3.7 | below -3.7 |
| 65 | above -1.9 | -1.9 to -3.5 | below -3.5 |
| 70 | above -1.7 | -1.7 to -3.2 | below -3.2 |
| 75 | above -1.2 | -1.2 to -2.9 | below -2.9 |
| 80 | above -0.5 | -0.5 to -2.6 | below -2.6 |
| 85 | above +0.1 | +0.1 to -2.2 | below -2.2 |

Return to main presentation

Papaioannou A, et al. *CMAJ* 2010 Oct 12. [Epub ahead of print].

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2010 Guidelines

# 10-year Risk Assessment for Men (CAROC Basal Risk)

| Age | Low Risk | Moderate Risk | High Risk |
|---|---|---|---|
| 50 | above -2.5 | -2.5 to -3.9 | below -3.9 |
| 55 | above -2.5 | -2.5 to -3.9 | below -3.9 |
| 60 | above -2.5 | -2.5 to -3.7 | below -3.7 |
| 65 | above -2.4 | -2.4 to -3.7 | below -3.7 |
| 70 | above -2.3 | -2.3 to -3.7 | below -3.7 |
| 75 | above -2.3 | -2.3 to -3.8 | below -3.8 |
| 80 | above -2.1 | -2.1 to -3.8 | below -3.8 |
| 85 | above -2.0 | -2.0 to -3.8 | below -3.8 |

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# 4: What laboratory tests should be done to exclude secondary causes of OP

- CBC
- SPEP: protein electrophoresis (myeloma)
  - if vertebral fracture
- TSH (hyperthyroidism)
- Creatinine (renal osteodystrophy)
- Calcium (Hyperparathyroidism)
- PO4, AlkPase (osteomalacia, liver disease)
- 25-OH-D after 3-4 months of adequate supplementation

# Back to Case 1

- Mrs. B's physical exam demonstrates a thoracic kyphosis.
- She has a diet low in calcium (Coffee with milk and cereal)
- You order BMD, T score is -2.1

What next?

# 5. Which life style modification can be used to treat bone density loss: Mrs. B's daughter wonders if these will help….

- Over age 50
  - 1200 mg elemental Ca (*2010 CPG*)
  - 800-1000 IU of Vitamin D, up to 2000IU
- Modify risk factors (smoking/ETOH etc)
- Weight bearing exercise

# Calcium and Vitamin D

Examples of foods high in calcium.

- Milk, yogurt, cheese
- Broccoli, spinach
- Pink salmon with bones, sardines
- Almonds, white beans

# How Much Calcium is Enough?

| Age | Calcium (mg/d) |
|---|---|
| Children (ages 4-8)* | 800 |
| Adolescents (ages 9-18)* | 1300 |
| Premenopausal women* | 1000 |
| Men < 50† | 1000 |
| Men > 50 | 1200 |
| Postmenopausal women > 50 | 1200 |
| Pregnant or lactating women (> 18) | 1000 |

# How Much Vitamin D Should I Get?

| Age | Vitamin D (IU/d) |
|---|---|
| Men & women under 50 years | 400 |
| Men & women over 50 years | 800 |

Good sources of Vitamin D

- Milk

  (100 IU/cup)
- Combined with calcium supplements

# Exercise for Strength and Balance

- Goal: decrease the risk of falling
  - Strengthen muscles
  - Improve posture & balance
- *Examples:*
  - Swimming
  - Bike riding (eg. stationary)
  - Rowing
  - Weight lifting (2 lb weights)

# 6. What about HRT

- HRT:
  - Used to be considered treatment of choice to age 75
  - Women's Health Initiative : 1st RCT with HRT
    - RR reduction: 35% of hip/vertebral fractures
    - Risk/Benefit ratio too high (esp CVD)
- SERMs: Evista (raloxifine):
  - effective at spine, some benefit lipid lowering,

# 7. BISPHOSPHATES-First Line therapy

- Benefit in postmenopausal women and in men
- Initiate when fracture risk is high
- Initiate in presence of fragility fracture or when on long term glucocorticoid therapy, irrespective of BMD result
- Bisphosphonates used in Canada:
  - Risedronate 150 mg monthly/35 mg weekly
  - Alendronate 70 mg weekly
  - Zolendroic acid once yearly i.v.

# Back to Case 1

You prescribe for Mrs. B :

- Vitamin D 1000 IU and Calcium Carbonate 650 mg daily
- Actonel (risedronate) DR 35 mg weekly
  - (Her 10 year risk score is moderate but she has vertebral fractures, so she is at high risk)
- All placed in her blister pack
- Daughter asks about side effects??

# 7. Bisphosphonates - precautions

- GI upset (esophagitis, diarrhea)
- Renal Failure –caution if Cr Cl <30cc/sec
- Osteonecrosis of the jaw
  - 1 per 10,000 patient-years
  - i.v. use, malignancy, recent major dental procedures
- Fractures of femur with longterm use
  - 2.3 per 10, 000 patient years
  - Account for less than 1% of all hip/femur fractures

# 8. Other options: parathyroid hormone

- PTH (Forteo):20 mcg sc hs via pen daily
  - Stimulates osteoblasts
  - 53% median reduction in nonvertebral fragility #
  - S/E: nausea,dizziness,cramps
  - Use for up to 18 months, cost $800.00/month

# 9. RANK ligand inhibitors

- Denosumab (Prolia)
  - reduces osteoclastic function
  - 60 mg sc q 6 months
  - S/E:
    - contraindicated in hypocalcemia
    - Possible serious infections
    - Dermatitis, eczema and rashes
    - ONJ

# Prolia on Ontario Formulary

- LU Code 428
  - Postmenopausal women with decline in BMD after one year of continuous bisphoshonate therapy and 2 of the following:
    - BMD T score ≤ 2.5
    - Prior fragility fracture
    - Age> 75
- LU Code 429
  - Postmenopausal women when bisphosphnate is contraindicated (hypersensitivity or abnormality of esopohagus (stricture or achalasia) and two of:
    - BMD T score≤2.5
    - Prior fragility fracture
    - Age> 75

# High risk

- Anyone with high absolute risk (>20 % risk of fracture in 10 years) should receive pharmacologic therapy

- Anyone > 50 y/o with fragility fracture of hip/vertebrae and anyone with more than one fragility fracture should be offered therapy

# Moderate risk

- Clinical evaluation to assess risk factors
- Offer therapy to certain individuals

*Most osteoporotic fractures occur in this group because there are more people in this group

# Low risk

- Lifestyle measures

# 10. How about a symptomatic vertebral fracture

- Most are asymptomatic
- Acetaminophen given regularly
- Back brace
- Once acute pain resolved - exercise
- Vertebroplasty
- Kyphoplasty

- ***(Calcitonin nasal spray no longer available for pain/OP: risk of neoplasm)***

# Case 2

Mrs. K is an 85 year old retired accountant. She lives in a retirement home and ambulates with a walker.

PMH:CAD, CHF (EF 10%) HTN, OP, depression, dementia.

She is independent in ADL, but needs help with bath. Poor appetite. Has dizzy spells, a fall 2 months ago.

BMD, T score is -3.0, same as 3 years ago.

Meds: Coversyl, HCTZ, galantamine , Calcium Carbonate, Vitamin D, Tylenol, risedronate (on it 6 years)

Son asks does she need the risedronate forever, he read a drug holiday should be tried.

What do you do?

# Case 2 Management

- Discuss options with caregivers

  Consider:

  - Continue Risedronate
  - Switch to Prolia
  - Review overall QOL, ?is life expectancy limited
    - ? Stop risedronate
  - No evidence for drug holidays
  - If high risk consider continuing treatment

# What is the evidence?

- Position statement (Australia) 2010 for residential aged care facilities (RACF):
  - Higher risk of fracture than community
  - Should assess for OP on admission
  - Nonpharmacological management
  - Vit D +/- Calcium
  - Bisphosphonates for high risk
- Quebec Symposium For Tx of OP in LTC (2004)
  - Prevalence rates 80-85%
  - Those who fracture hospitalized 15 X more likely in the following month
  - Vitamin D, calcium, exercise
  - For high risk, pharmacological tx
- CMAJ fall 2015 –Canadian guidelines on OP management in LTC

Early release, published at www.cmaj.ca on September 14, 2015. Subject to revision.

CMAJ GUIDELINES CME

# Recommendations for preventing fracture in long-term care

Alexandra Papaioannou MD MSc, Nancy Santesso RD PhD, Suzanne N. Morin MD MSc, S
Jonathan D. Adachi MD, Richard Crilly BSc MD, Lora M. Giangregorio PhD, Susan Jaglal
Robert G. Josse MBBS, Sharon Kaasalainen PhD, Paul Katz MD, Andrea Moser MD MSc,
Hope Weiler RD PhD, Susan Whiting PhD, Carly J. Skidmore MSc, Angela M. Cheung MD
for the Scientific Advisory Council of Osteoporosis Canada

*CMAJ* Podcasts: author interview at https://soundcloud.com/cmajpodcasts/141331-guide

The 2010 clinical practice guideline for the diagnosis and management of osteoporosis in Canada[1] focused on the care of adults living in the community. However, the fracture rate for adults living in long-term care (residents) is two to four times that of adults of similar age living in the community, and one-third of older adults who experience hip fracture are residents in long-term care.[2] Hip fracture is one of the most serious consequences of osteoporosis and also one of the leading causes of admission to hospital.[3] When residents return to long-term care after a hospital stay, they need additional hours of specialized care.[4,5] In addition, fracture pain and delirium frequently associated with analgesia are distressing for residents and their families. Vertebral fractures are also a concern for residents, and the reported prevalence is up to 30% (for at least one moderate to severe fracture).[6] Multiple vertebral fractures can be a substantial cause of pain, anxiety, depression, reduced pulmonary function[7] and agitation.

Frail older adults at high risk of fracture in long-term care face other challenges. More than 40% have dementia,[8] a similar percentage experience swallowing difficulties,[9,10] and over 20% may have renal insufficiency.[11,12]

It may be difficult to identify residents at high risk of fracture, as the current fracture risk assessment tools (the Canadian Association of Radiologists and Osteoporosis Canada tool[13] [CAROC; www.osteoporosis.ca/multimedia/pdf/CAROC.pdf] and the Canadian WHO Fracture Risk Assessment Tool [FRAX; www.shef.ac.uk/FRAX/]) provide 10-year fracture risk and have not been validated in long-term care, where over 20% of residents may die within one year of admission.[14,15] Most research regarding risk assessment and pharmacologic therapies has not included those with multiple comorbidities.[16,17]

## Scope

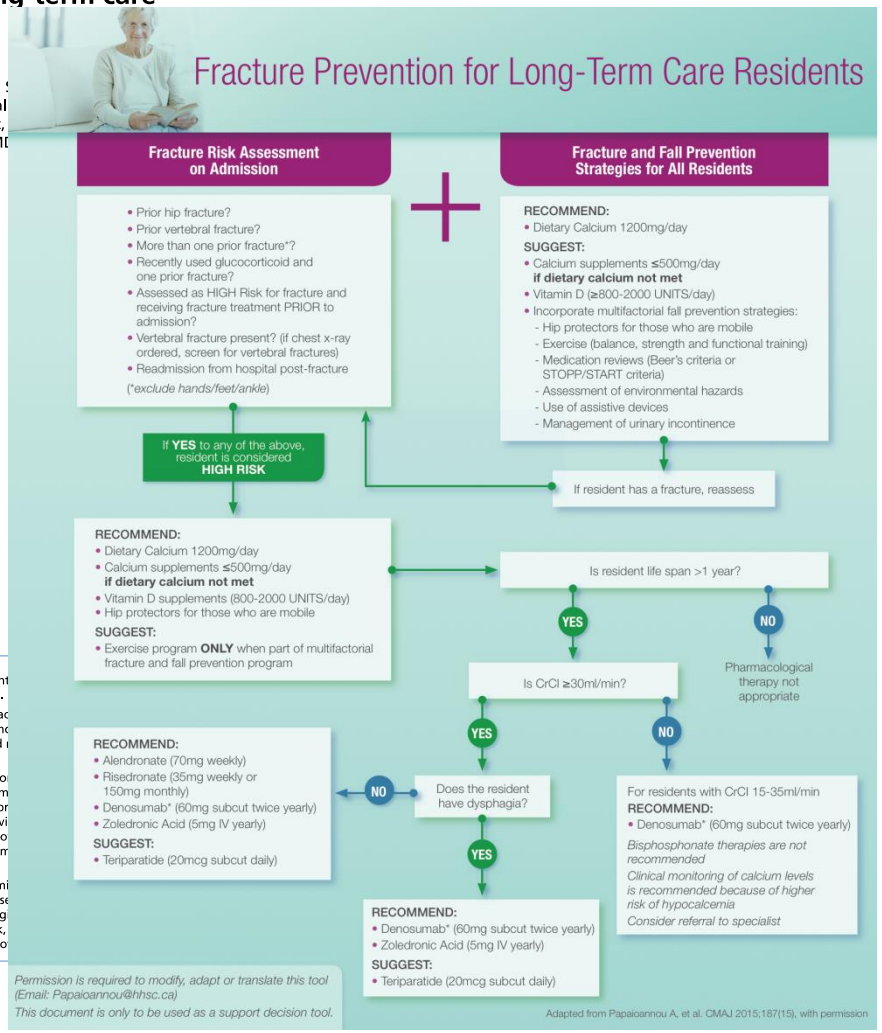
This document provides guidance regarding strategies for the prevention of fractures directed toward interprofessional teams caring for frail older adults in long-term care.

## Methods

This guideline, which has been endorsed by Osteoporosis Canada, was developed using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach[18,19] (www.gradeworkinggroup.org), in a process led by a GRADE methodologist (N.S.). The guideline panel comprised the authors, other multidisciplinary health care providers and researchers, and representatives from resident and family councils (see Appendix 1, available at www.cmaj.ca/lookup/suppl/doi:10.1503/cmaj.141331/-/DC1). The panel was first surveyed to prioritize questions and impor-

### Key points

- In older adults living in long-term care (resident agitation, immobility and transfers to hospital.
- Residents identified as being at high risk of frac prior fracture of the hip or spine, those with mo fracture and those with one prior fracture and glucocorticoids.
- Recommendations for preventing fracture in lo developed using the GRADE (Grading of Recom Assessment, Development and Evaluation) appr consideration of the quality of the available evi between benefits and harms, the preferences o care providers, and the resources required to im recommendations.
- Strategies to prevent fractures, including vitami supplementation, use of hip protectors, exercise interventions to prevent falls and pharmacolog tailored to each resident's level of fracture risk, expectancy, renal function and ability to swallo



# Monitoring therapy

1. **Receiving treatment: repeat BMD after 1-3 years**
   - BMD the same or better = good response
   - Decreased BMD, new fracture = treatment failure, poor adherence, or secondary causes of osteoporosis
2. **Moderate risk not on treatment: BMD in 1-3 years**
   - If BMD stable, less frequent monitoring required
3. **Low risk repeat BMD at 5-10 years**

# Back to questions…

- 1. When to STOP bisphosphonates - e.g. frail elder with diagnosed osteoporosis, on bisphosphonate x 5 or more years, high risk for falls, not much change in BMD in past 5 years.

  No, continue if high fracture risk

- 2. To use calcium supplements, or not to use calcium supplements in those with osteoporosis and inadequate dietary calcium (won't drink milk or fortified OJ, eat cheese, yoghurt or canned sardines/salmon with bones). ... especially if they have known CAD

  Yes, as long as total dietary and supplement is 1200 mg and not more

- 3. How to manage the patient with normal BMD, but clinically obvious kyphosis, and loss of height.

  BMD unreliable as fractured spine, treat OP

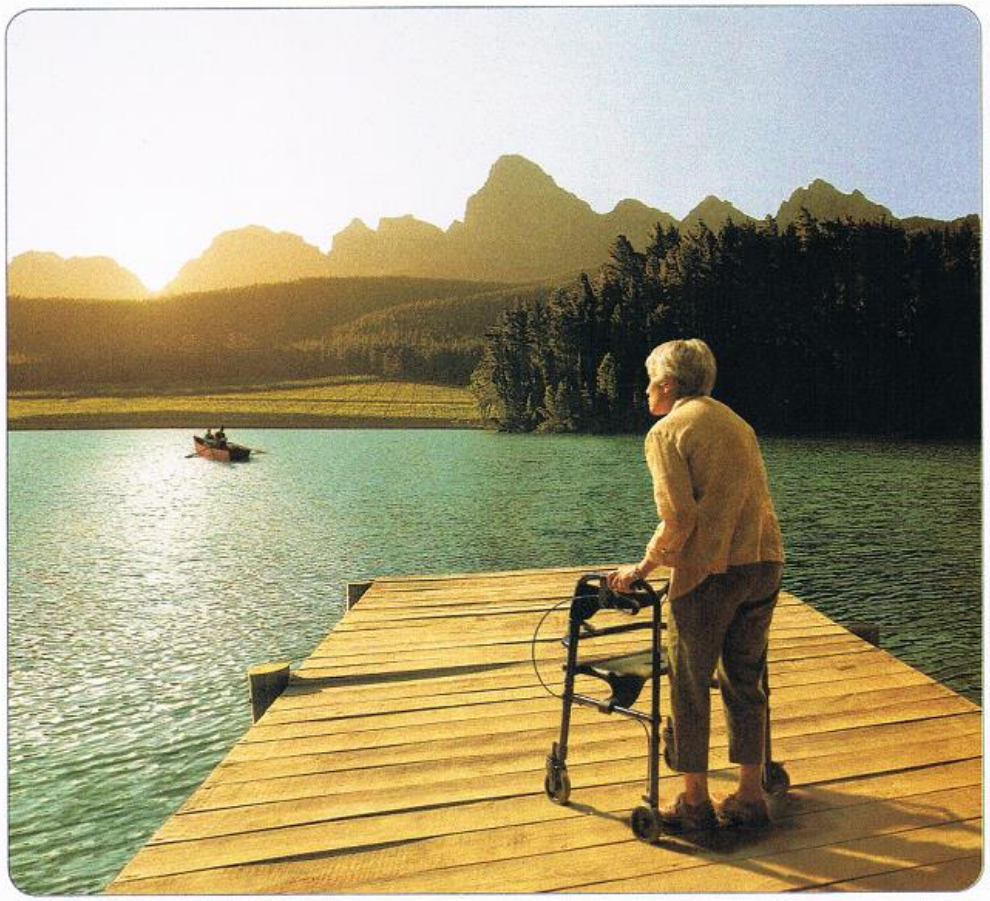
  Use CAROC 10 year fracture risk criteria

# In Conclusion

- OP is under recognized and under-treated
- Care Gap- after a fragility fracture
    - <10% men and < 20% women are treated
- Each decision to use a treatment should depend on
    - Risk of having different types of fractures in future
    - Consequences of a fracture (pain, disability, death)
    - Comorbidities and life expectancy should be considered before investigating
    - - Expected effects of treatment (Bone density could be regained within 6 months and fracture rates decrease within a year of treatment)
    - Cost of treatment
    - Any inconvenience, side-effects or risk of treatment

# Resources


- Osteoporosis Society of Canada: www.osteoporosis.ca
- Papaioannou A et al. 2010 Clinical Practice Guideline for the diagnosis and management of osteoporosis in Canada: summary. CMAJ 2010. 182(17): 1864-1873
- WHO FRAX tool website. http://www.shef.ac.uk/FRAX/tool.aspx?country=19
- Duque G et al. To treat or not to treat, that is the Question: Proceedings of the Quebec Symposium for the treatment of Osteoporosis in LTC institutions. JAMDA September 2006
- Duque G. et al. Treatment for osteoporosis in Australian residential aged care facilities: consensus recommendations for fracture prevention. MJA August 2010



# Is osteoporosis part of your retirement plan?

Osteoporosis doesn't develop in a single day. But it can change your life overnight. When bones become brittle, just one break can take away your independence and shatter your dreams for retirement. And since one in four women over 50 will develop osteoporosis, it's a good idea to start investing in your bone health now.

**You could be at risk.**
To find out more or to make a donation,
visit www.osteoporosis.ca or call 1-800-463-6842.

Osteoporosis Canada
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# THANK YOU!!

# ANY QUESTIONS?