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Osteoporosis Canada

Recommendations for Preventing Fracture in Long-Term Care

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Objectives

- Learn how to apply the 2015 Fracture Prevention Recommendations for frail older adults in long-term care
- Improve fracture risk assessment and identification of residents at high risk
- Learn how to choose non-pharmacological and pharmacological therapies for residents at high risk of fracture

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How common are fractures in older adults in long-term care?

Prevalence of fracture in LTC

- Prevalence of all fractures is higher in LTC
  - Fracture rate for adults in LTC is 2-4 times that of similarly aged adults living in the community[1]
  - One third of older adults who experience hip fractures are residents in LTC[2]
- Up to **30%** of residents have vertebral fracture[3]

[1]Consensus Development Conference. *Am J Med*. 1991
[2]Crilly RG et al. *J Aging Research*. 2010
[3]Rodondi A et al. *Osteoporos Int*. 2012

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What is the impact of fractures?

Impact of fractures in LTC

- Fragility fractures are responsible for excess mortality, morbidity, chronic pain, admission to institutions and economic costs[1-3]
- Those with hip or vertebral fractures have substantially increased risk of death after the fracture[2]
- Multiple vertebral fractures can cause significant pain, anxiety, depression, reduced pulmonary function and agitation[4]

[1]Papaioannou A et al. *Osteoporos Int*. 2009
[2]Ioannidis G et al. *CMAJ*. 2009
[3]Wiktorowicz ME. *Osteoporos Int*. 2001
[4]Papaioannou A et al. *Am J Med*. 2002

In women, a hip fracture leads to…

Future fracture	• 10% will re-fracture within one year[1]
Decreased quality of life	• 53.5% died or developed new total dependence within 180 days. Function declined substantially after fracture across all ADL domains[2]
Long-term care admissions	• Up to 18% enter LTC[3]
1-year Mortality	• 20% for individuals returning to the community[1] • 40% for those living in LTC[1]

[1]Papaioannou A et al. *J Soc Obstet Gynaecol Can.* 2000
[2]Neuman M et al. *JAMA Intern Medicine*. 2014
[3]Jean et al. *JBMR*. 2012

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What is the goal of the Fracture Prevention Recommendations?

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Reduce immobility, pain, transfers to hospital and improve quality of living of residents

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The Recommendations

- The proposed recommendations integrate falls and osteoporosis assessment taking into consideration lifespan, renal impairment and simultaneous risks of falls and fractures

- Recommendations consider various treatment strategies in addition to pharmacotherapy

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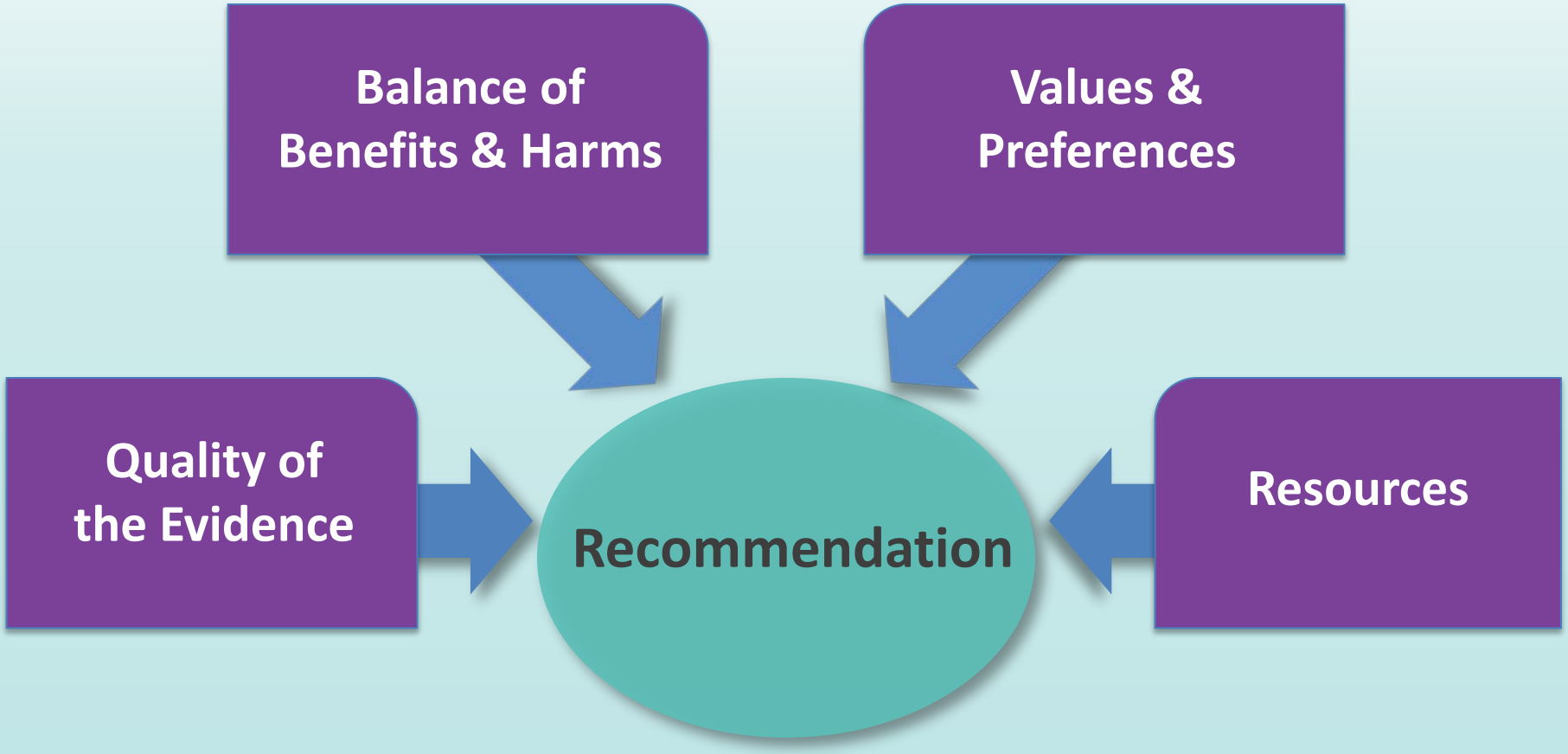
How were the recommendations developed?

Using the GRADE Approach[1]



[1]Balshem H et al. *J Clin Epidemiol*. 2011

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How can the recommendations be interpreted?

Interpreting the recommendations[1]

Implications	Strong Recommendation "we recommend"…	Conditional Recommendation "we suggest"…
FOR PATIENTS/RESIDENTS	Most individuals in this situation would want the recommended course of action, and only a small proportion would not	The majority of individuals in this situation would want the suggested course of action, but many would not
FOR CLINICIANS	Most individuals should receive the intervention	Clinicians recognize that different choices will be appropriate for each individual and that clinicians must help each individual arrive at a management decision consistent with his/her values and preferences

[1]www.gradeworkinggroup.org

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How do we assess high risk of fracture in LTC?

Guidelines intervention groups

Recommendations for interventions to prevent fracture were developed for the following groups:

- Older residents in LTC at high risk of fracture
- Older residents in LTC not at high risk of fracture

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Who is at HIGH risk for fractures?

Ask the following questions on admission[1]

Determine…	How to assess?...
Prior hip fracture	*"have you ever broken your hip?"*
Prior vertebral fracture	*"have you lost height?"* *If YES and >6 cm historically, order lateral thoracic and lumbar spine*
More than one prior fracture *(excluding fractures of the hands/feet/ankle)*	*"have you had a broken bone after 50?"*
If recently used systemic glucocorticoids and have had one prior fracture	*Are you using medications such steroids or prednisone?*
If identified as high risk and/or on osteoporosis treatment prior to admission	*"have you been on osteoporosis medications?*

BMD is not required to identify residents at high risk of fracture

[1]Papaioannou A et al. *CMAJ*. 2010

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If the answer is YES to any of the previous questions, the resident is considered at HIGH RISK for fracture

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What are the recommendations for calcium and vitamin D?

Considerations in supplementation

- Oro-pharyngeal Dysphagia
  - 7 to 40% of LTC residents[1]
  - Common in neurological diseases[1]
  - Variable ability to swallow liquids or mixed textures
  - Supplement options
    - Pills: If can crush and mix with food (ensure small volume)
      - If can't crush, consider liquid alternative or other route of administration
    - Liquids: assess thickness, mix with foods (attention to small volumes)
    - Specially fortified foods might help improve vitamin D intakes and should be considered where feasible in LTC
      - One study achieved 488 ± 132 IU/d vitamin D[2]

[1]Namasivayam & Steele, J Nutr Gerontol Geriatr 2015;
[2]Adolphe et al, Can J Diet Prac Res 2009

Calcium

- For all residents, we recommend dietary interventions to meet the recommended dietary allowance (RDA) for calcium
  - The RDA for people >70 years for calcium is 1200 mg daily (3 servings of dairy or dairy equivalents)

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Calcium

- For residents at high risk who cannot meet the RDA for calcium through dietary intake, we recommend daily supplements of calcium up to 500 mg

- For residents who are not at high risk of fractures and who cannot meet the RDA for calcium through dietary intake, we suggest daily supplements of calcium up to 500 mg, depending on resources and their (or their caregiver's) values and preferences

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Vitamin D

- For residents at high risk of fractures, we recommend daily supplements of 800 – 2000 UNITS vitamin D_3

- For residents not at high risk, we suggest daily supplements of 800 – 2000 UNITS vitamin D_3, depending on resources and their (or their caregiver's) values and preferences

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What are the recommendations for exercise?

Exercise

- For residents at high risk of fractures, we suggest balance, strength and functional training exercises only when part of a multifactorial intervention to prevent falls
  - *This recommendation places a high value on avoiding the small increase in falls which may occur among individuals at high risk of falls who participate in exercises, such as balance, strength and functional training*
- For residents not at high risk, we suggest balance, strength and functional training exercises to prevent falls
  - *This recommendation places a high value on the probably small reduction in falls that is achieved with exercise, as falls may lead to serious injuries. It also places high value on the other benefits that exercise could provide.*

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What are multifactorial interventions and recommendations?

Multifactorial interventions

- Any combination of interventions that are tailored to an individual's risk to reduce falls.
- Such interventions may include:
  - medication reviews, assessment of environmental hazards, use of assistive devices, exercise, management of urinary incontinence and educational interventions directed to staff

For all residents, **we suggest** multifactorial interventions that are individually tailored to reduce the risk of falls and fractures

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What are the recommendations for the use of hip protectors?

Hip protectors

- For residents who are mobile and at high risk of fractures, we recommend hip protectors

- For residents who are not at high risk of fracture but are mobile, we suggest hip protectors depending on resources available and the residents' values and preferences.

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What are pharmacological therapy recommendations for older adults?

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We calculated effects of benefits and harms at one year or more and therefore, these recommendations apply to older persons with life expectancy greater than one year

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For HIGH RISK residents, we recommend..

1st line therapy

- **Alendronate** → **70 mg weekly**
- **Risedronate** → **35 mg weekly or 150 mg monthly**

Recommended Administration:

- ✓Not to be crushed
- ✓In the morning, on an empty stomach
- ✓If resident can remain upright for 30 min after administration

NOTE Risedronate DR can be taken immediately after breakfast and is not required to be taken first thing in the morning on an empty stomach.

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Contraindications

Alendronate and risedronate are not recommended for older persons with severe renal insufficiency (creatinine clearance <35 mL/min or <30 mL/min, respectively)

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For HIGH RISK Residents + Difficulty Taking Oral Medications, we recommend..

1st line therapy

- **Denosumab* (60 mg subcut twice yearly)**
- **Zoledronic Acid (5mg IV yearly)**

**This recommendation applies to the older persons who have difficulty taking oral medications due to dysphagia, an inability to sit up for 30 min, cognitive impairment or intolerance*

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Contraindications

Denosumab:

- While denosumab can be prescribed to residents with renal impairment, they are at higher risk of developing hypocalcemia

Zoledronic Acid:

- Health Canada advises that caution is necessary for people who receive other medications that could affect renal function; CrCl should be monitored before and periodically after treatment. Appropriate hydration (500 mL of water) is necessary before and after treatment. This medication should not be administered in people with severe renal impairment (CrCl <30 mL/min)

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For HIGH RISK residents, we suggest...

Teriparatide
(20 mcg subcut daily)

Although the benefits of teriparatide (in particular on vertebral fracture) probably outweigh harms of treatment, the cost of therapy restricts its access, and there may be a higher burden due to daily injections

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For HIGH RISK Residents, we suggest not to use…

Etidronate

There is moderate quality evidence for little to no reduction in fractures (in particular hip fractures) with etidronate. The cost is also high given the lack of important benefits.

Raloxifene

The harms of raloxifene (e.g. venous thromboembolism and musculoskeletal events – arthralgia, myalgia) probably outweigh the probable reduction in vertebral fractures and small reductions in hip and non-vertebral fractures

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Summary

- Determine risk of fracture on resident's admission
  - Calcium and vitamin D supplementation
    - Exercise, hip protectors and multifactorial interventions
      - Pharmacological therapy for residents at high risk

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For access to the recommendations and other tools and resources, please visit Osteoporosis Canada at www.osteoporosis.ca

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