A Practical Approach to Engaging Multiple Disciplines to Reduce Fracture Risk in Long-Term Care

Ontario Osteoporosis Strategy for Long-Term Care

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Faculty/Presenter Disclosure

- **Faculty: Jonathan Adachi**
- **Relationships with financial sponsors:**
  - **Grants/Research Support:** Amgen, Radius
  - **Speakers Bureau/Honoraria:** Amgen, Gilead, Paladin, OCFP, GERAS
  - **Other:** CIHR

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- **Faculty:** Sid Feldman
- **Relationships with financial sponsors:**
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- **<u>Potential for conflict(s) of interest</u>:**
  - none

Mitigating Potential Bias

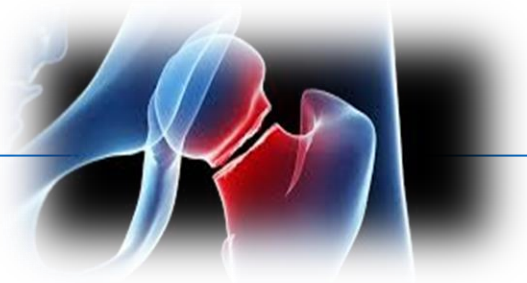
- Pharmacological therapy will be presented only as part of clinical recommendations determined using a GRADE approach (evidence-based approach) to guideline development

- All pharmacological therapy will be presented in its generic form

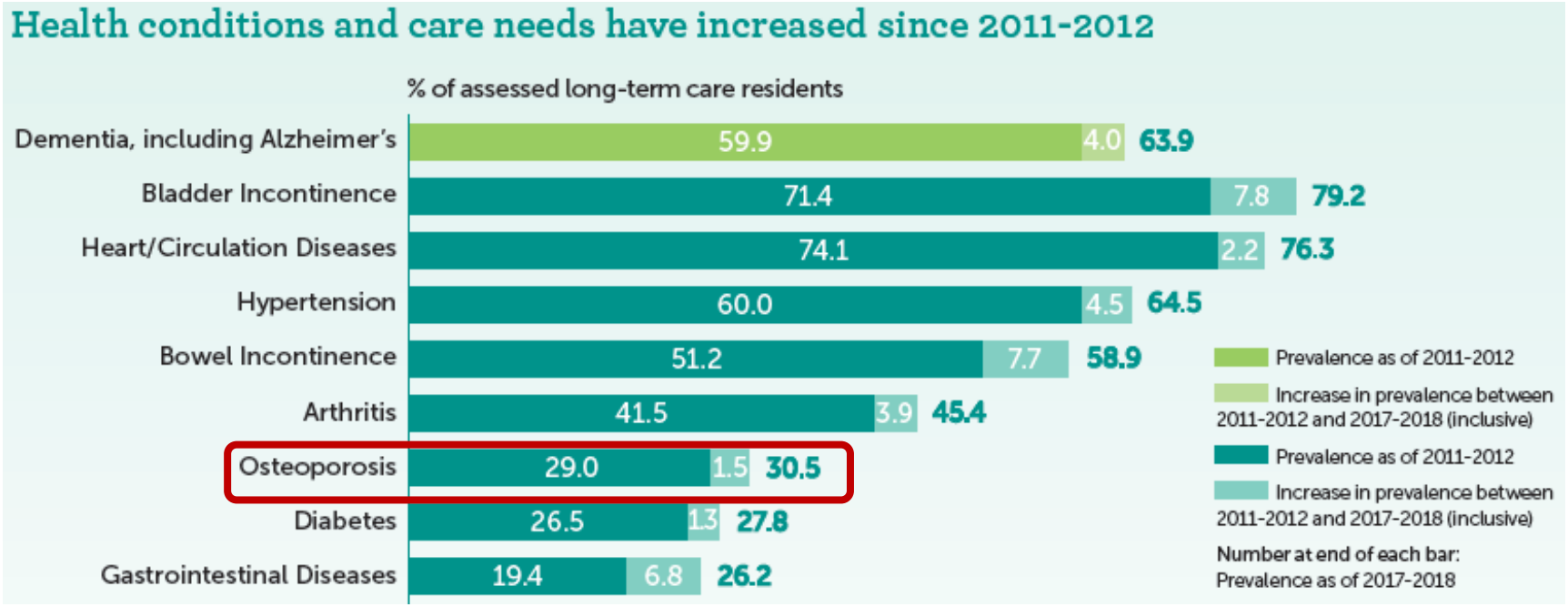
Learning Objectives

1. Use the Fracture Risk Scale (FRS) to assess fracture risk.
2. Adopt a team approach to develop and implement fracture risk-based care plan.
3. Incorporate an evidence-based care plan for fracture prevention

Why focus on fracture prevention?



Osteoporosis is common and prevalence is increasing



This is Long-Term Care 2019. *Ontario Long-Term Care Association*. www.oltca.com
Data generated by the Canadian Institute for Health Information (CIHI)

Hip fractures in LTC are a huge problem

- 2-6% of residents each year[1,2]
- Rate in LTC is twice as high as in the community[1,2]
- Most common fracture type in LTC (49%)[2]
- 39% of residents will die within 12 months post-fracture[3]
- In 2014, cost per LTC resident was $54,822[4]
- All fractures in LTC cost $1.03 Billion annually in Canada[4]

1. Ronald LA et al. *Can J Aging*. 2008;27:109-115
2. Papaioannou A. et al. *Osteoporos Int.* 2016;27:887-97
3. Papaioannou A, et al *J Soc Obstet Gynaecol Can* 2000; 22(8):591-7
4. Hopkins et al. *Osteoporos Int* 2016;27;3023-3032

Fractures are a game changer for LTC residents!

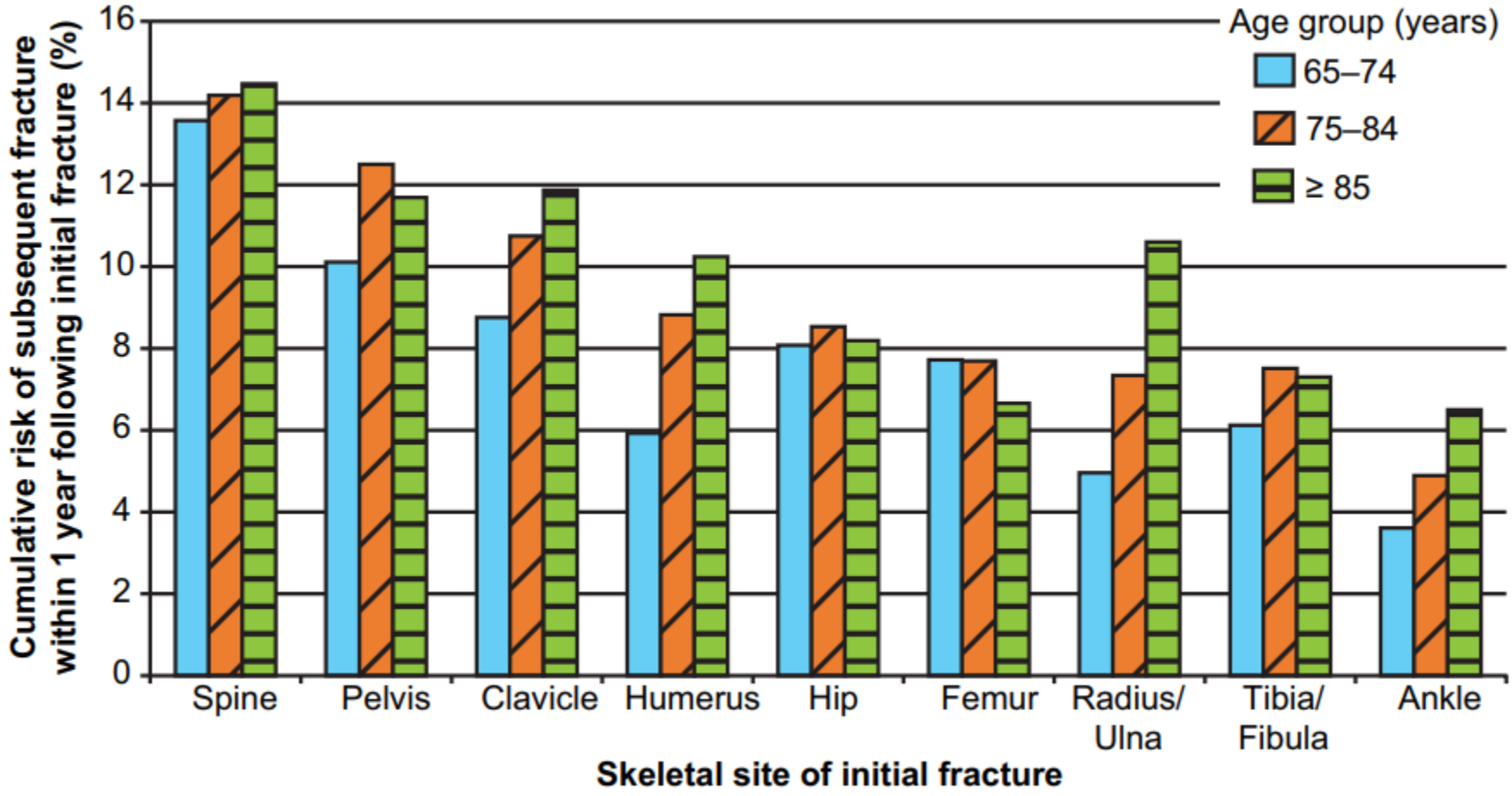
Hip fractures are associated with:

- Substantial mortality
- Increased dependence in ADLs:
  - Getting in and out of bed
  - Dressing
  - Transferring
  - Personal hygiene

Particularly for oldest old and those receiving non-operative management

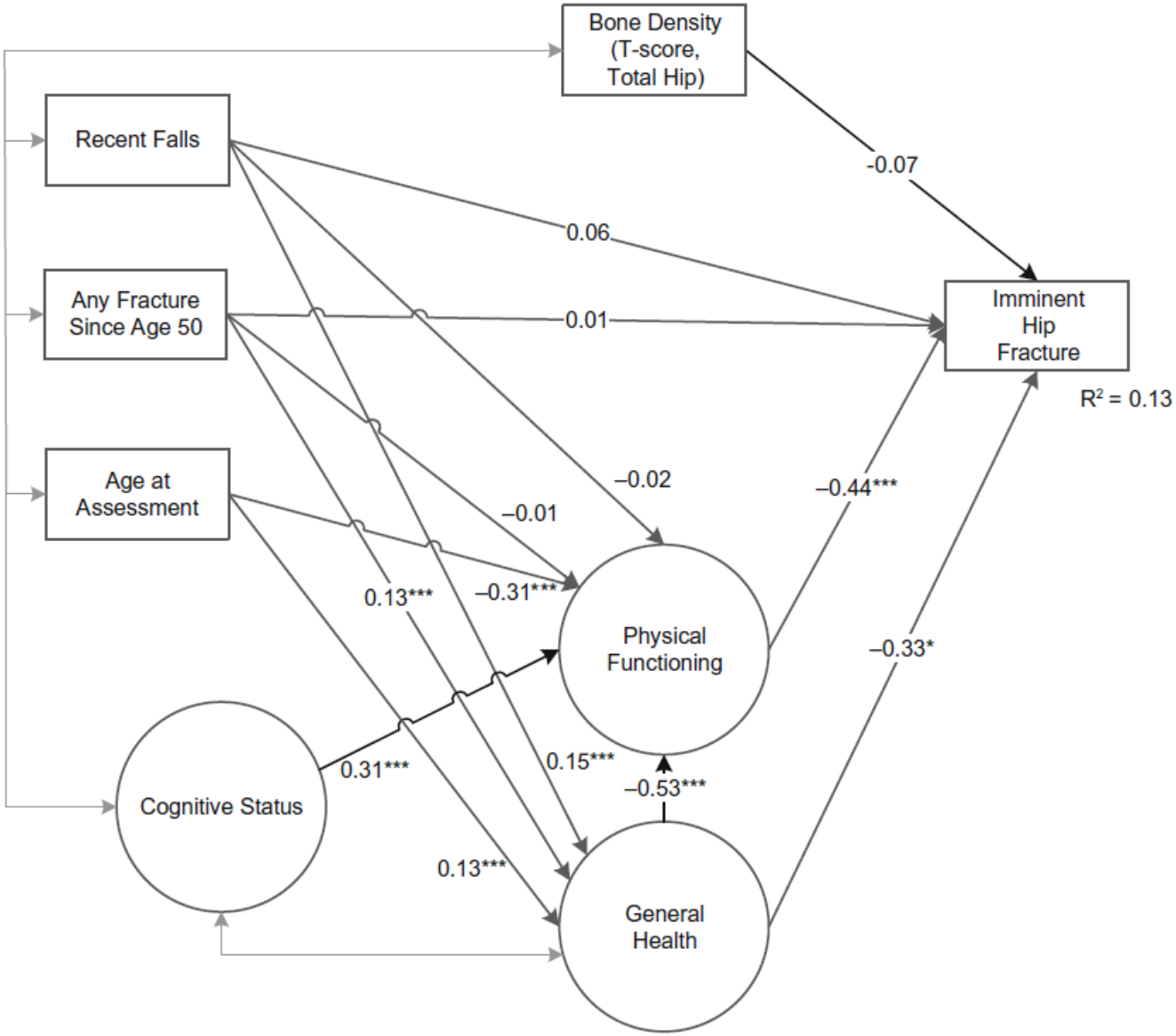
Neuman MD, et al. *JAMA*, 2014; 174(8):1273-1280.

Risk of fractures at 1 year post incident fracture



Balasubramanian et al. *Osteoporos Int* 2019; 30:79-92.

Determinants of Imminent Hip Fractures



Barron et al. Osteopor Int 2020;31:2103-2111.

First fractures predict second fractures!

Think of fracture like stroke and myocardial infarction:

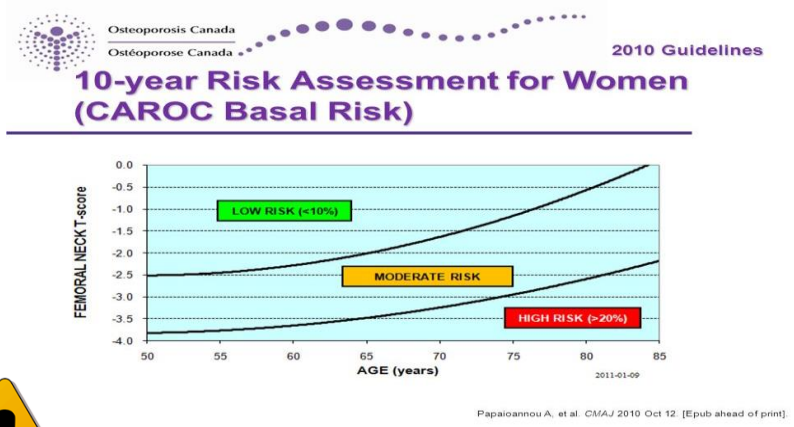
The first year post event is highest risk!

Huntjen et al. *Osteo Int* 2010;2:2075-2085
Inose et al. *Euro Spine J.* 30 January 2021

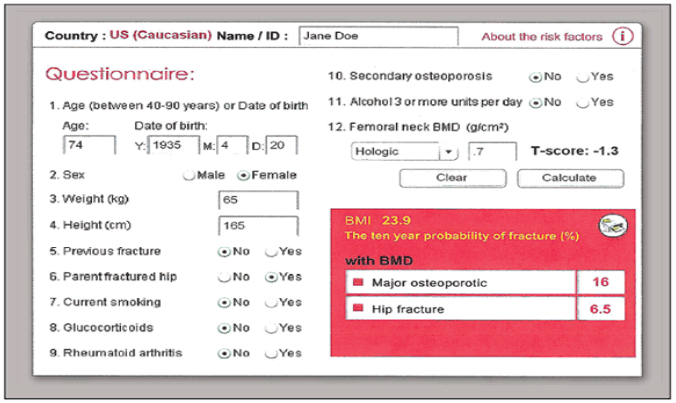
How is fracture risk usually assessed?

Typical fracture risk assessment:

CAROC



FRAX



- Not validated for the LTC population
- Require bone mineral density testing
- 10-year fracture prediction not very helpful as average LOS in LTC is <18 months
- Missing risk factors applicable for the LTC population

Ioannidis G, et al. *BMJ Open*, 2017;7.

Challenges to Bone Mineral Density testing in LTC

- Not possible to bring BMD testing machines to LTC
- Difficult to access – requires family or staff to accompany resident; transportation
- Mobility impairment
- Cognitive impairment – difficult to follow instructions
- Kyphosis – difficult/ painful to lie flat
- Frailty – difficult to maintain a steady position

Tseng et al. *Osteo Int* 2017;28:3439-3449

How can we assess fracture risk in LTC?

The Fracture Risk Scale (FRS)

- ✓ Predicts hip and major fractures for LTC residents
- ✓ Requires no additional documentation or resources/ score is autogenerated
- ✓ No BMD testing required
- ✓ Validated across Canada
- ✓ Can improve care, quality of life, and prevent fractures
- ✓ Supports care planning using the fracture prevention recommendations for LTC

Embedded in RAI – MDS 2.0/ LTCF tools

Ioannidis G, et al. *BMJ Open*, 2017;7.
Negm A, et al. *BMC Geriatrics*, 2018; 18(320).

How was the FRS developed?

FRS Development

Three databases were linked to develop the FRS:

- **RAI-MDS 2.0**
  - Standardized global assessment tool mandated for use in all LTC homes in Ontario

- **Discharge Abstract Database (DAD)**
  - National database
  - Administrative, clinical and demographic information on hospital visits

- **National Ambulatory Care Reporting System (NACRS)**
  - National database
  - Emergency department visits, & day surgery

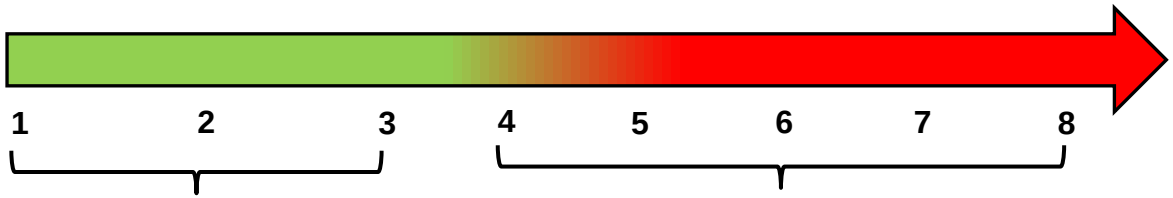
Ioannidis G, et al. *BMJ Open*, 2017;7.

Factors that increase fracture risk in LTC (N = 29,848)

Risk Factors	% All Residents
Age group (85+)	45.9%
Women	66.0%
Previous fracture	10.1%
Body mass index	
<18	8.0%
18-30	74.6%
Fall in past 180 days	33.8%
Walking in corridor	
Independently	35.3%
With supervision/ assistance	31.3%
Total dependence	33.4%
Cognitive impairment	56.2%
Wandering frequency	
Daily (in past 7 days)	11.7%

Ioannidis G, et al. *BMJ Open*, 2017;7.

FRS Scores and Hip Fracture Risk Factors



Walk in corridor and BMI > 30

or

Unable to walk in corridor and no fall past 30 days

Walk in corridor and BMI 18-30

& one of the following:

- Prior fall
- Prior fracture
- Cognitive impairment (CPS 3-6)
- Tendency to wander
- Age >85

or

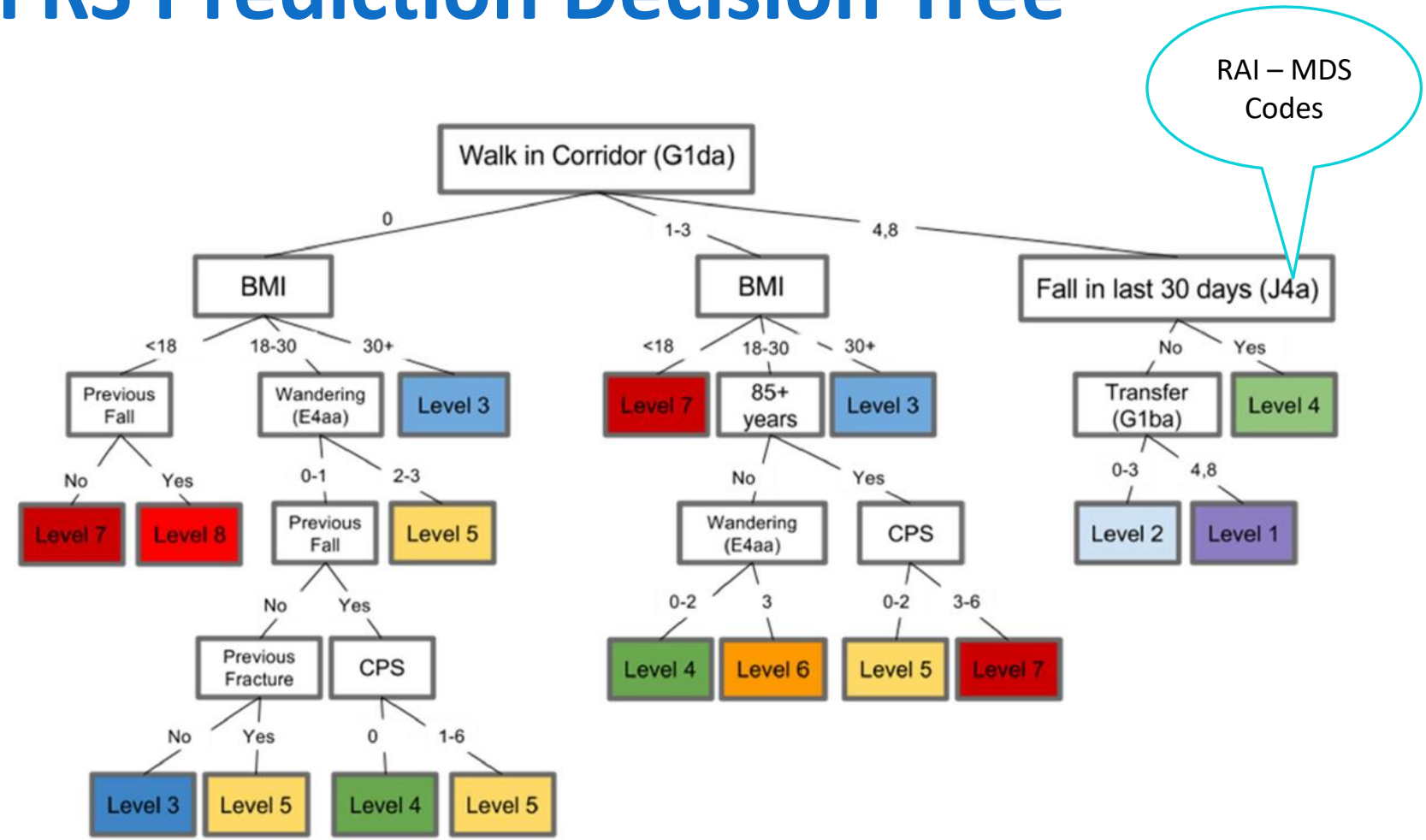
Unable to walk in corridor and had a fall in past 30 days

or

Walk in corridor and BMI <18 with or without a fall

Ioannidis G, et al. *BMJ Open*, 2017;7.

FRS Prediction Decision Tree



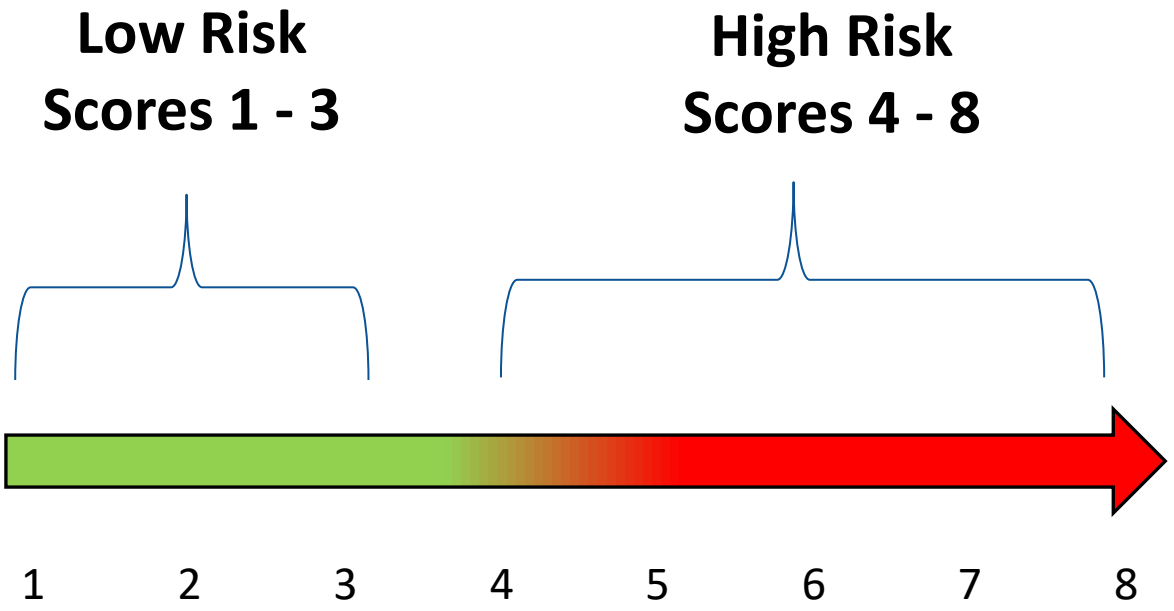
Previous Fall = Any fall in the previous 180 days
Previous Fracture = Any fracture in previous 180 days
BMI = Body Mass Index
CPS = Cognitive Performance Scale

Ioannidis G, et al. *BMJ Open*, 2017;7.

Fracture Risk Scale

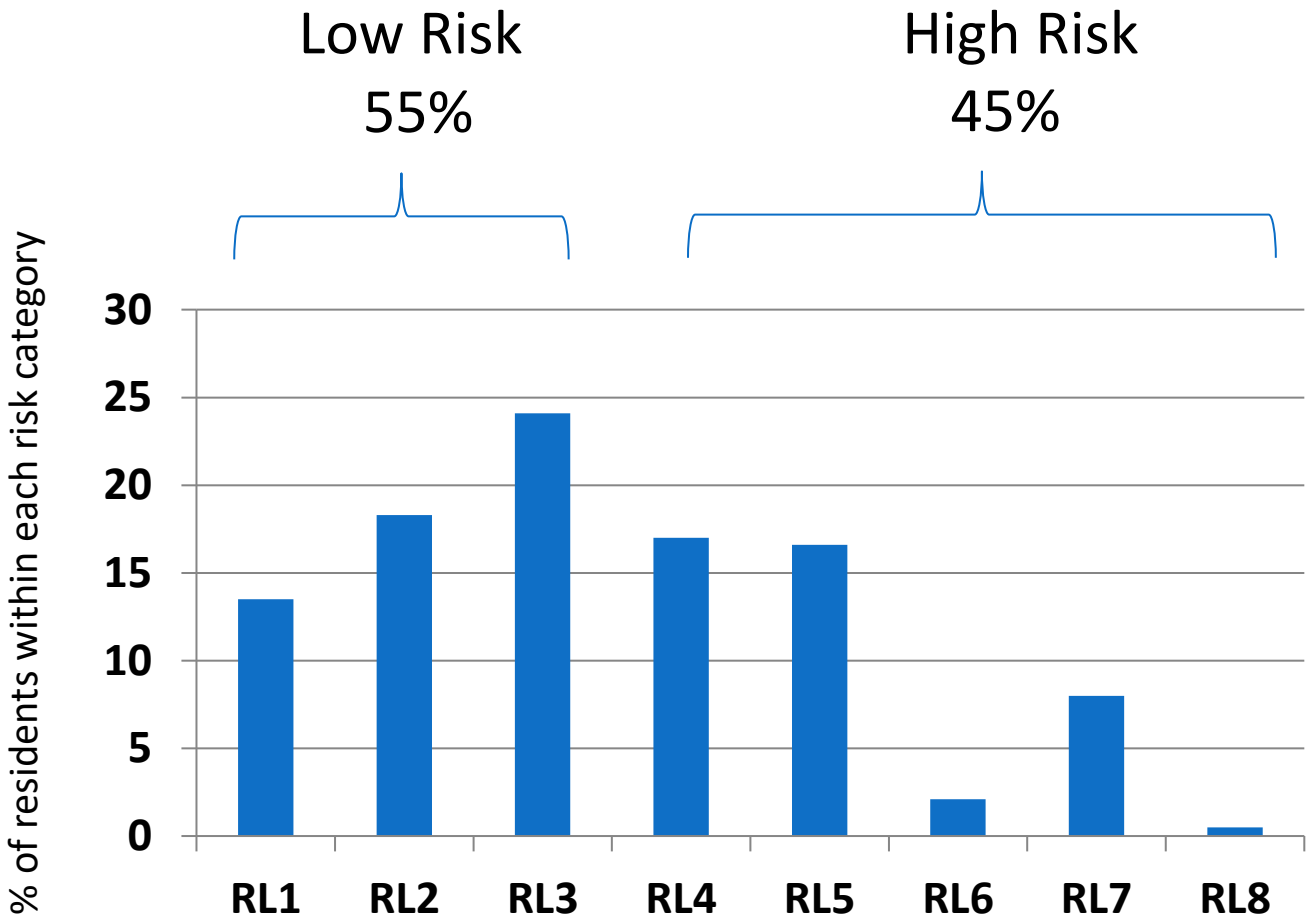
Identifies fracture risk in the next year

Scored from 1 (lowest risk) to 8 (highest risk)



Ioannidis G, et al. *BMJ Open*, 2017;7.

% of Residents within Each Risk Level

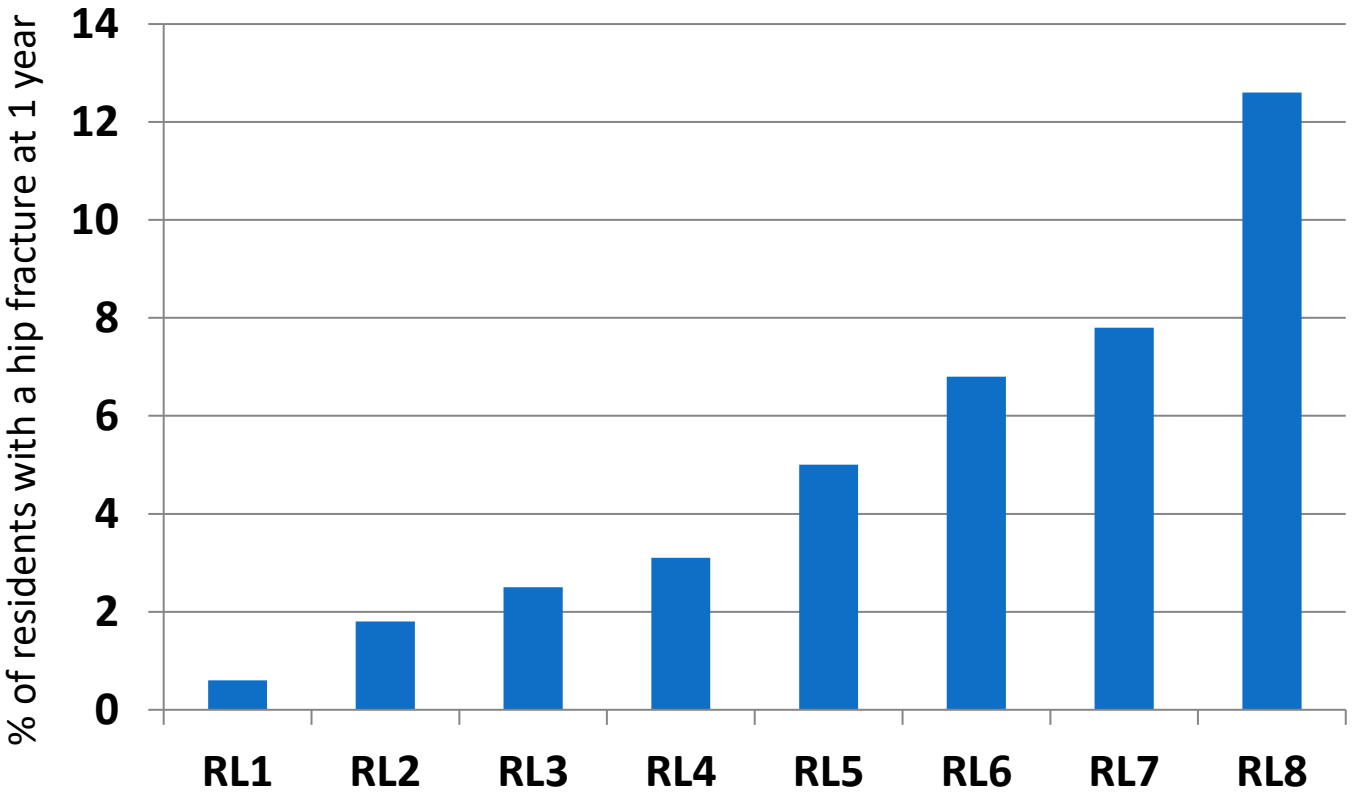


RL = FRS Risk Level

Ioannidis G, et al. *BMJ Open*, 2017;7.

What is the percentage of hip fractures at each FRS risk level?

% of Residents with a Hip Fracture at 1 Year in each Risk Category



RL = FRS Risk Level

Ioannidis G, et al. *BMJ Open*, 2017;7.

Odds Ratios* for Hip Fracture for each Risk Level

Risk Levels	Odds Ratio of Hip Fracture
FRS 2 vs 1	3.0 (1.9-4.6)
FRS 3 vs 1	4.2 (2.7-6.3)
FRS 4 vs 1	5.2 (3.4-7.9)
FRS 5 vs 1	8.3 (5.5-12.6)
FRS 6 vs 1	11.6 (7.0-19.1)
FRS 7 vs 1	13.4 (8.8-20.5)
FRS 8 vs 1	23.0 (12.5-42.3)

*Odds calculated using multivariable logistic regression analysis

Ioannidis G, et al. *BMJ Open*, 2017;7.

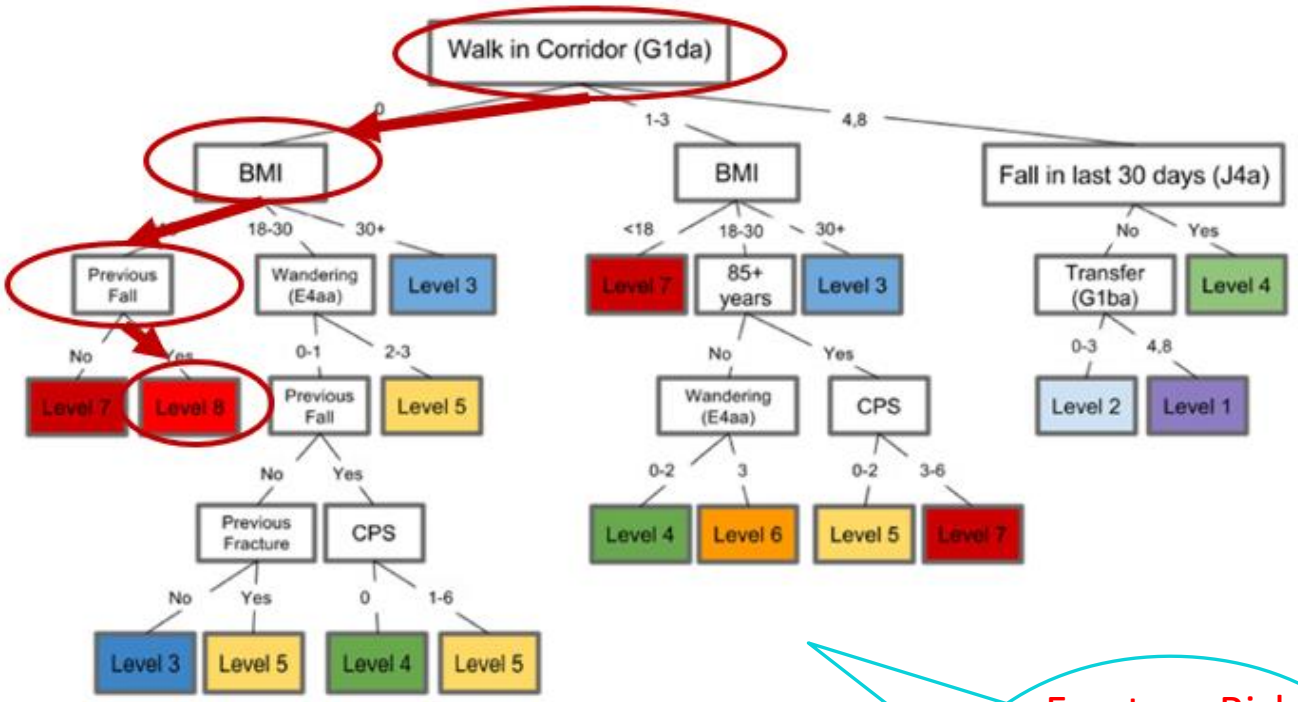
Using the FRS

Meet Matild Maasburg

- 84 years old, admitted 2 years ago
- Height = 5’6”; Weight = 111lbs; BMI = 17.9
- Walks independently with a walker
- Fell 4 months ago, getting up from bed to go to the washroom at night
- No known previous fractures
- ***Diagnoses:*** hypertension, Alzheimer’s disease (Cognitive Performance Score = 4), osteoarthritis, hypothyroidism, kyphosis
- Kidney function: eGFR = 56
- No swallowing issues
- ***Medications:*** donepezil 10mg; acetaminophen 650mg TID; ramipril 5mg; thyroxine 75mcg; Senokot BID

What is Matild’s fracture risk? Low? High?

Matild's FRS Decision Tree

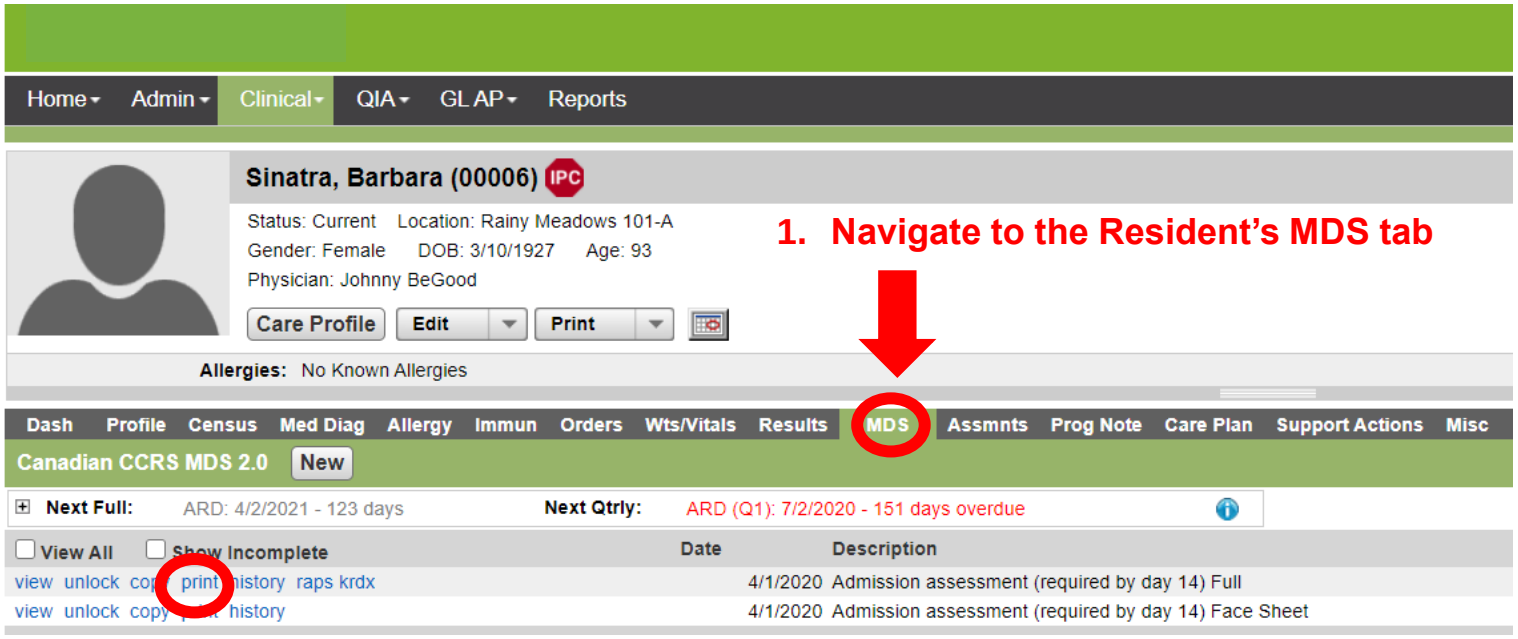


Fracture Risk Score = 8
Matild is at **HIGH** risk for fractures

Where can I find the FRS Score?

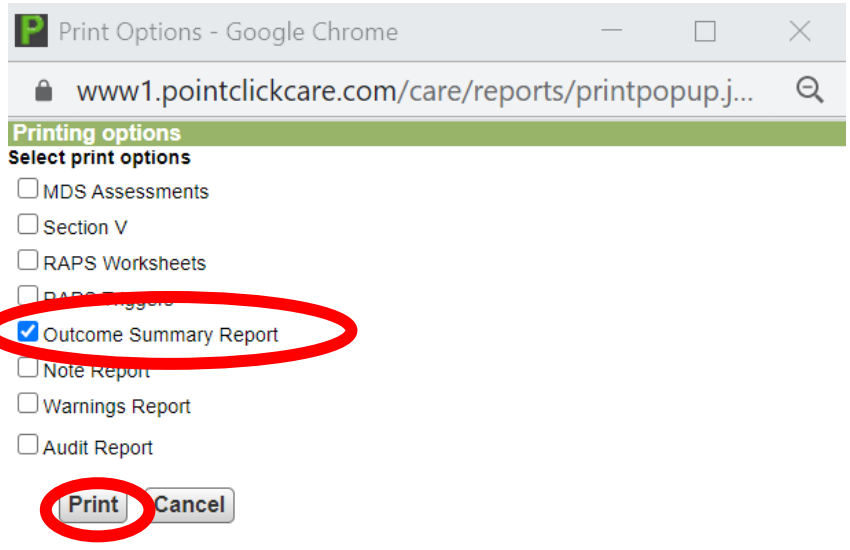
In RAI-MDS (MDS 2.0) / LTCF Tool go to

Outcomes Summary Report
Fracture Risk Scale = Score



1. Navigate to the Resident's MDS tab

2. Click *Print*

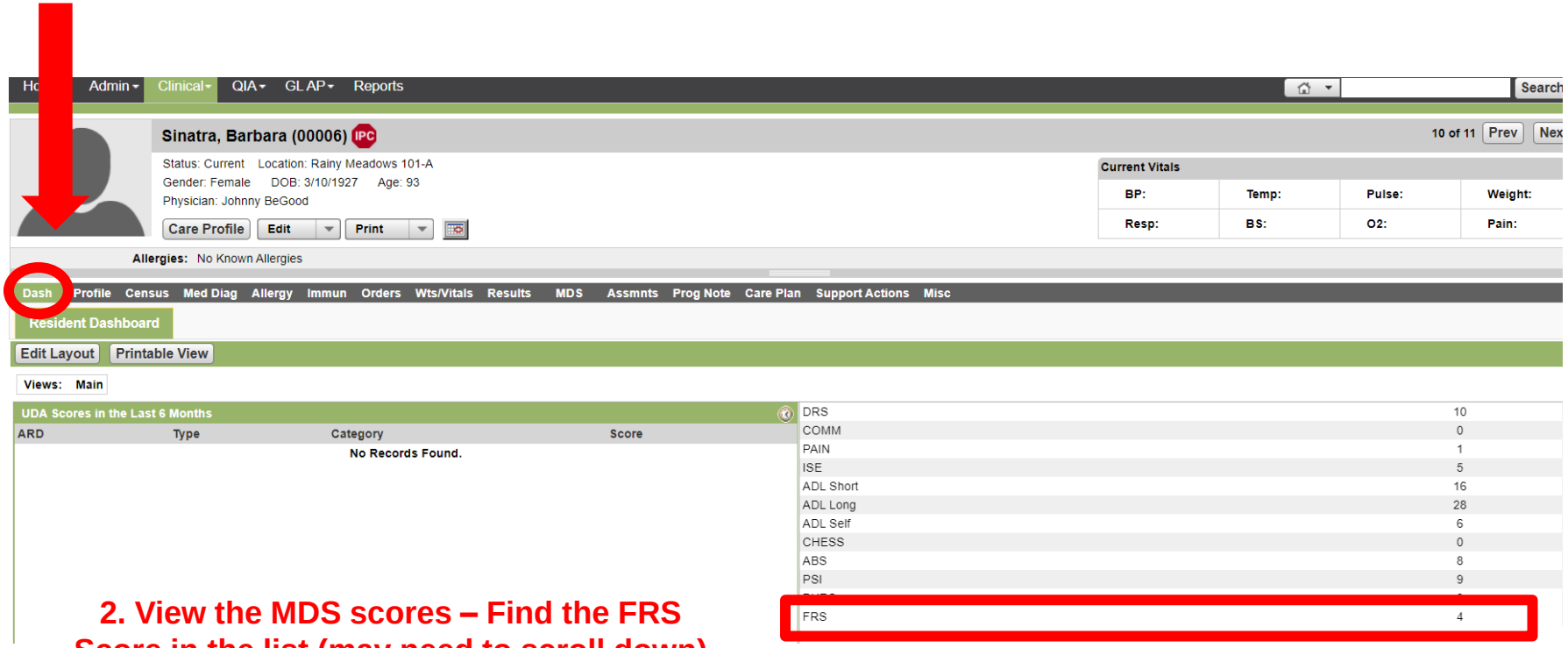


3. Check the *Outcome Summary Report* box

4. Click on *print*

Quick access to FRS score

1. Navigate to the resident *Dash*



2. View the MDS scores – Find the FRS Score in the list (may need to scroll down)

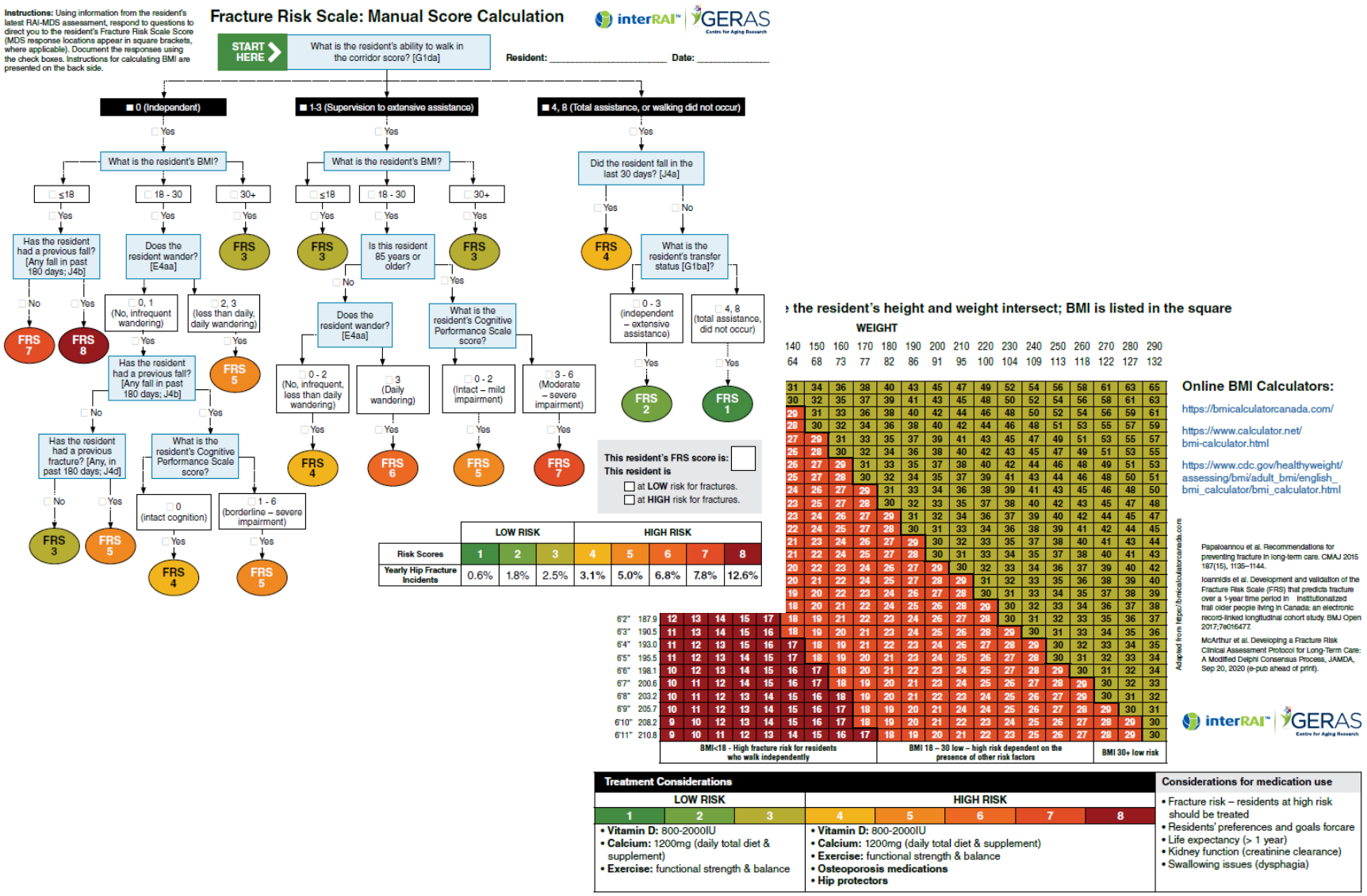
The Outcome Summary Report will be generated.

This will give the FRS Score for that MDS Assessment.

Outcomes	
RUG	SSC
CMI	1.4
CPS	0
DRS	10
COMM	0
PAIN	1
ISE	5
ADL Short	16
ADL Long	28
ADL Self	6
CHESS	0
ABS	8
PSI	9
PURS	3
FRS	4

My EMR does not include the FRS, how can I calculate fracture risk?

FRS Manual Calculation Tool



Some Cautions About the FRS

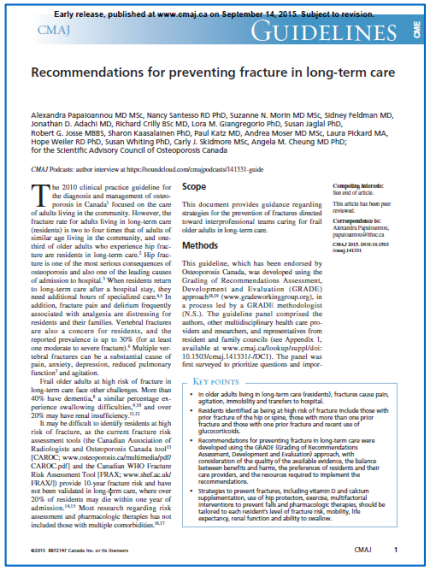
- Only includes fractures that were experienced in the past 180 days (6 months).
- FRS assesses risk for hip fracture but may underestimate the risk for vertebral fractures.
- FRS calculates risk based on variables available in the RAI-MDS 2.0 – other risk factors may exist that are not included.
- The FRS is only as good as the data that is entered into the RAI-MDS.

Ioannidis G, et al. *BMJ Open*, 2017;7.

Now that fracture risk is known, what next?

Recommendations for Fracture Prevention in LTC[1]

- Directed at interprofessional teams in LTC
- Recommendations related to:
  - Pharmacologic therapies for those at high risk
  - Hip protectors
  - Exercise
  - Multifactorial interventions
  - Calcium and vitamin D
- Guidelines will appear in FRS CAP
- Goals:
  - Reduce pain, immobility, and hospital transfers
  - Improve quality of life for residents in LTC



1. Papaioannou, A. et al. *CMAJ* 2015; 187(15): 1135-44.
2. Guyatt, GH. Et al. *BMJ* 2008; 336:1049-51.

Fracture prevention for those at low risk (FRS scores 1 – 3)

Diet and supplements	• Dietary calcium 1200 mg/day • Calcium supplements ≤500 mg/day if dietary cannot be met, considering values and preferences • Vitamin D supplementations (800-2000 IU/day)

Multifactorial fall prevention strategies	• Exercise (balance, strength, and functional training)
	• Medication reviews (Beer's criteria or STOPP/START criteria)
	• Assessment of environmental hazards
	• Use of assistive devices
	• Management of urinary incontinence
	• Hip protectors for those who are mobile considering resources and residents' values and preferences
	  • Opportunities to try various models
	  • Education on benefits and limitations

McArthur et al. *JAMDA*, 2021; 22(8):1726-1734

Fracture prevention for those at high risk (FRS scores 4 – 8)

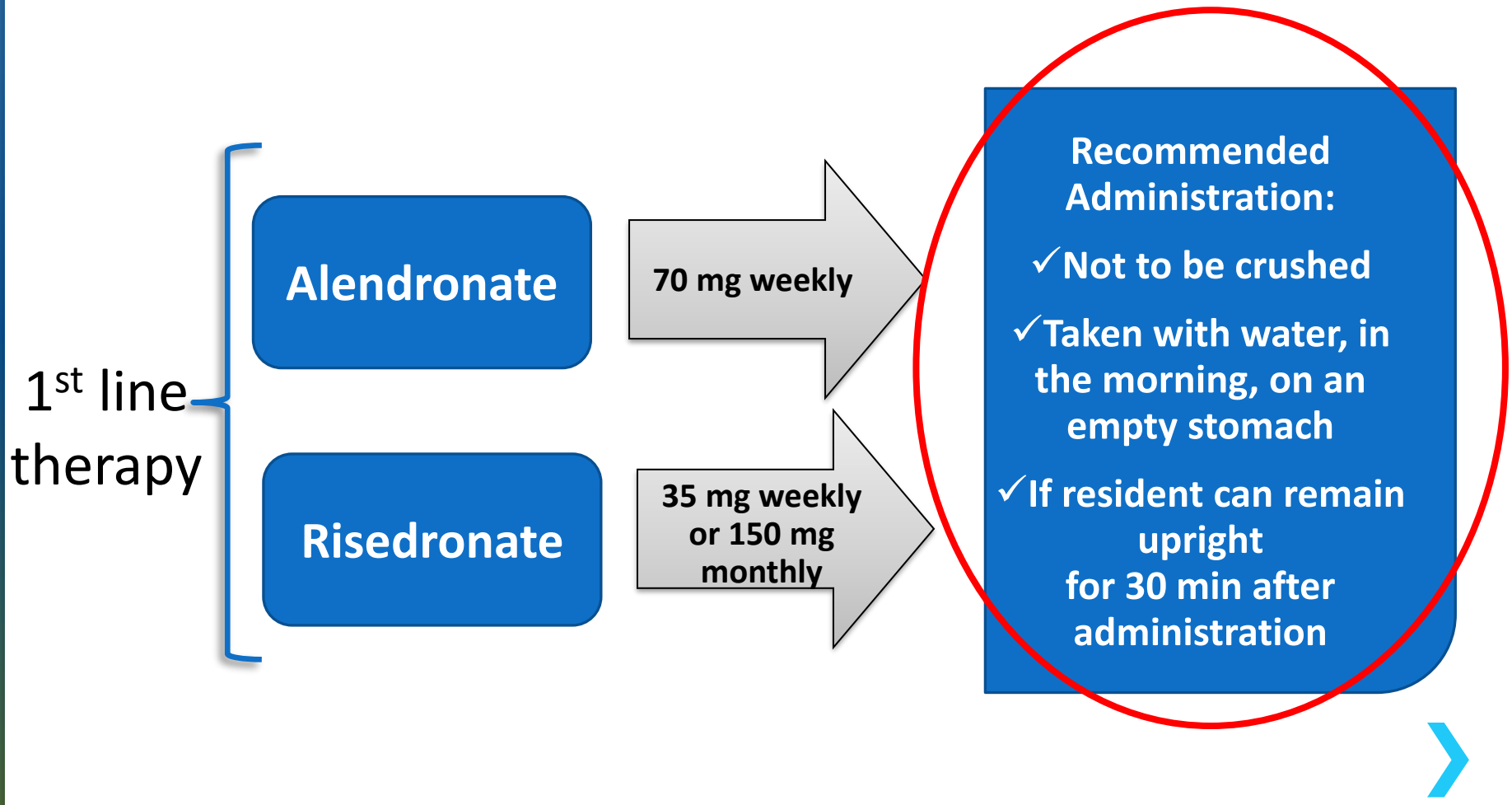
Diet and supplements	• Dietary calcium 1200 mg/day • Calcium supplements ≤500 mg/day if dietary cannot be met • Vitamin D supplementations (800-2000 IU/day)

Multifactorial fall prevention strategies	• Hip protectors for those who are mobile (value, preference & resource dependent)
	• Exercise (balance, strength, and functional training) as part of a multifactorial fracture and fall prevention strategy, considering:
	  • residents' preferences, desires, beliefs and attitudes
	  • promoting social support (e.g., group exercise)
	  • providing stimulating environments (e.g., coloured equipment, music).
	  • providing training and involve residents, family members, volunteers and primary health care providers

Medications	• Prescribe osteoporosis medications; considering:
	  • residents' preferences and values
	  • adequacy of kidney function (creatinine clearance)
	  • presence of dysphagia
	  • whether life expectancy exceeds time to benefit from the medication

McArthur et al. *JAMDA*, 2021; 22(8):1726-1734

For HIGH RISK residents, we recommend…



Papaioannou A et al. *CMAJ*. 2015

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

*Funding differs by province

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*

Up to 40% LTC residents have dysphagia

Papaioannou A et al. *CMAJ*. 2015;187:1135-1144.
Namasivayam & Steele. J Nutr Gerontol Geratr 2015;34:1-21.

How should I treat fracture risk if I think my resident's life expectancy is likely not more than one year?

Medication management and life expectancy

- Life expectancy is one of several criteria to inform decision-making.
- Residents at high risk for fractures should be treated considering:
  - Residents' preferences and values
  - Adequacy of kidney function (creatinine clearance)
  - Presence of dysphagia
  - Whether life expectancy exceeds time to benefit from medication

McArthur et al. *JAMDA* 2021; 22(8):1726-1734

Matild's care plan
FRS = High Risk

Comprehensive
Resident-centred

- Bisphosphonate therapy
- Medication review to reassess need for ramipril
- Vitamin D supplements; dietary calcium preferred over supplements
- Physiotherapy – strength and balance training; reassess use of walker; postural training
- Consider use of hip protectors
- Comprehensive falls assessment; reassess toileting plan

Reflects interprofessional collaboration

How can I implement the fracture prevention recommendations in my LTC home?

Impact of team approaches

Osteoporos Int (2011) 22:2321–2328
DOI 10.1007/s00198-010-1466-0

ORIGINAL ARTICLE

A team approach: implementing a model of care for preventing osteoporosis related fractures

M. Giles · J. Van Der Kallen · V. Parker · K. Cooper · K. Gill · L. Ross · S. McNeill

- Increase awareness of osteoporosis
- Increase identification of at-risk patients
- Support coordinated and comprehensive care
- Improve management

Hale & Goehring. *Annals LTC* 2003;11;40-47.

Team approaches to fracture prevention

- Multi-disciplinary:
  - Physicians
  - Nurses
  - Pharmacists
  - Physiotherapy
  - Dietitian
  - Recreation/ Activation specialists
  - Personal Support Workers
- Expertise for coordinated, comprehensive care planning

Professional Advisory Committees (PAC Teams)

Covering all fracture prevention recommendations

Hale & Goehring. *Annals LTC* 2003;11;40-47.

What role do various disciplines play in fracture prevention?

Physicians

- Know residents' FRS score
- Ensure fracture prevention plan is developed and used
- Care planning: Lead care team to ensure guidelines are implemented
- Medication review: Deprescribe meds linked to falls
- Review calcium and vitamin D supplementation
- Prescribe osteoporosis medications considering:
    - Residents' preferences and values
    - Adequacy of kidney function
    - Presence of dysphagia
    - Life expectancy

Nurses

- Know residents' FRS score
- Ensure fracture prevention plan is developed and used
- Care planning: Ensure guidelines are implemented
- Communicate with team, esp. PSWs to ensure safe care provided
- Explore use of hip protectors
- Manage urinary incontinence
- Complete falls risk assessment, examining all risk factors (health-related, behavioural, social, environmental)

Pharmacists

- Know residents' FRS score
- Ensure fracture prevention plan is developed and used
- Medication review (BEERS, STOPP/START)
  - Identify medications associated with ↑ falls
  - Quarterly after a fall, with change in acute status
- Review potential for osteoporosis medications with physician, knowing CrCl, swallowing status

Physiotherapists & other Exercise Professionals

- Know residents' FRS score
- Complete assessments: mobility, balance, falls risk
- Develop treatment plans involving 1:1 therapeutic exercises and/ or group exercise
- Involve family members in completing exercises
- Implement guidelines:
  - ensure adequate balance, strength, and functional training

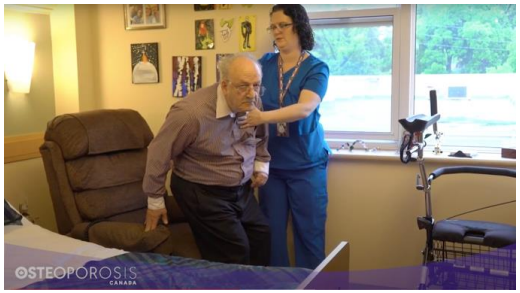
Dietitians

- Know residents' FRS score
- Complete nutrition assessments to ensure adequate calcium and protein intake
- Develop mean plans to address nutritional deficits
- Provide suggestions for increasing dietary calcium intake
- Follow guidelines:
  - **High** and **low** risk: 1200mg daily (total diet and supplements)

Personal Support Workers

- Know which residents are at high fracture risk
- Ensure safe transferring techniques
- Promote proper positioning for sitting
- Integrate sit-to-stand exercises into personal care routines
- Declutter rooms to remove trip/ fall hazards
- Ensure use of proper non-slip footwear
- Make sure mobility aids are used and in close reach

Restorative Care



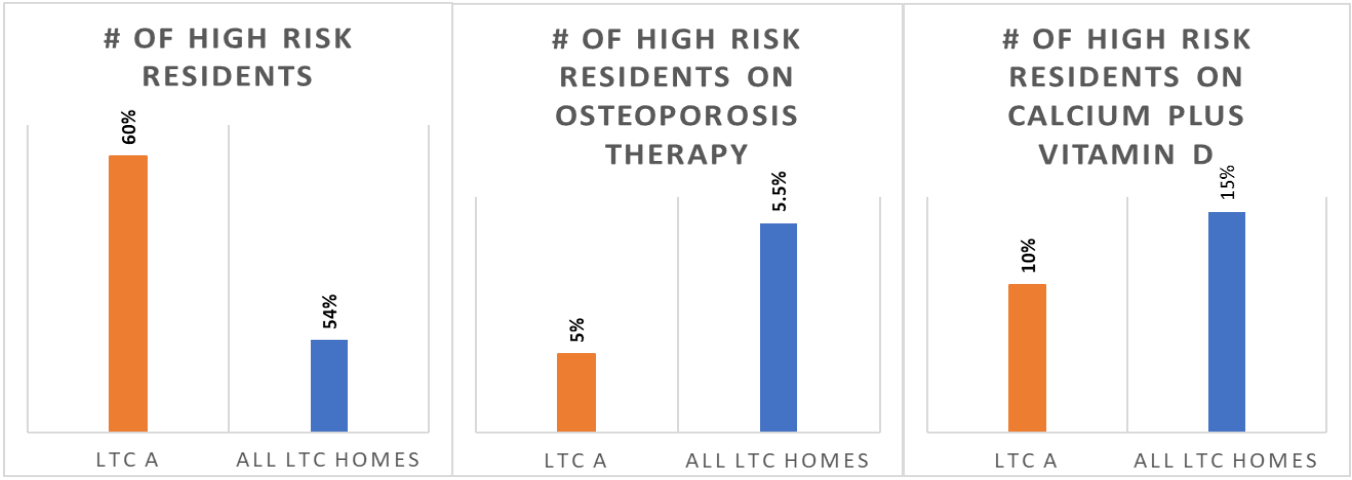
- Know residents' FRS score
- Practice spine sparing strategies
- Incorporate simple balance and strength exercises into walking programs
- Provide postural cues through range of motion exercises
- Promote proper posture

How can we implement a team approach to fracture prevention in LTC?

Implementing a Team Approach

PCC will be automating A & F in the near future

- Know residents' FRS score
- Make sure all team members know which residents are at high fracture risk
- Ask pharmacist to conduct an audit and feedback to identify opportunities for practice improvements



Implementing a Team Approach

- Ensure team members know the fracture prevention guidelines or can access information or education on the guidelines
- Create opportunities for teams to discuss high risk residents (e.g., case reviews, PAC meetings)
- Review resident history to identify potential fall and fracture risks
- Create care plans with input from all disciplines
- Ask each discipline/ team member: “Considering what we know about this resident, ,

Strategies for implementing the FRS

- Minimize increase in workload:
  - Standardized processes
  - Integration of FRS CAP into existing processes
- Training on FRS CAP usage
- Education for residents and families:
  - Importance of guidelines
  - Advocating for following guidelines
- Persuasion through resident and staff stories to show:
  - Impact of fractures
  - Value of using the FRS CAP

Bai et al. *BMC Geriatrics* 2021; 21:467.

What tools are available to support fracture risk reduction in LTC?

Google LTC fracture prevention

https://www.gerascentre.ca/osteoporosis-strategy-for-long-term-care/

GERAS Centre for Aging Research

McMaster University | BRIGHTER WORLD | Hamilton Health Sciences

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About us | Frailty and Dementia Research | Osteoporosis LTC | Recent Publications | Members Login

Osteoporosis Strategy for Long Term Care

FREE

Fracture Prevention Toolkit

Resources for Health Professionals

Resources for Residents & Families

Pearls

- Avoid fractures – Avoid pain, disability, death.
- Determine risk of fracture on admission and quarterly.
- Use the FRS as a valid tool for assessing fracture risk.
- Treat fractures - first fracture predicts a second fracture.
- Engage the multi-disciplinary teams to increase identification and improve management.

Papaioannou A et al. *CMAJ*. 2015
Kennedy C et al. *Implementation Science*. 2012
Hale & Goehring. *Annals LTC* 2003;11;40-47.

Pearls

- Treat fracture risk with consideration to:
  - Residents' preferences and values
  - Kidney function and dysphagia
  - Whether life expectancy exceeds time to benefit from medication.
- Consider a quality improvement approach to fracture prevention in your home (e.g., using audit and feedback).

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QUESTIONS?
COMMENTS?
CONCERNS?