



Prostate Cancer  
Centre

# Optimizing Bone Health in Patients with Prostate Cancer

Lori Styner, Bone Health Specialist, Prostate Cancer Centre

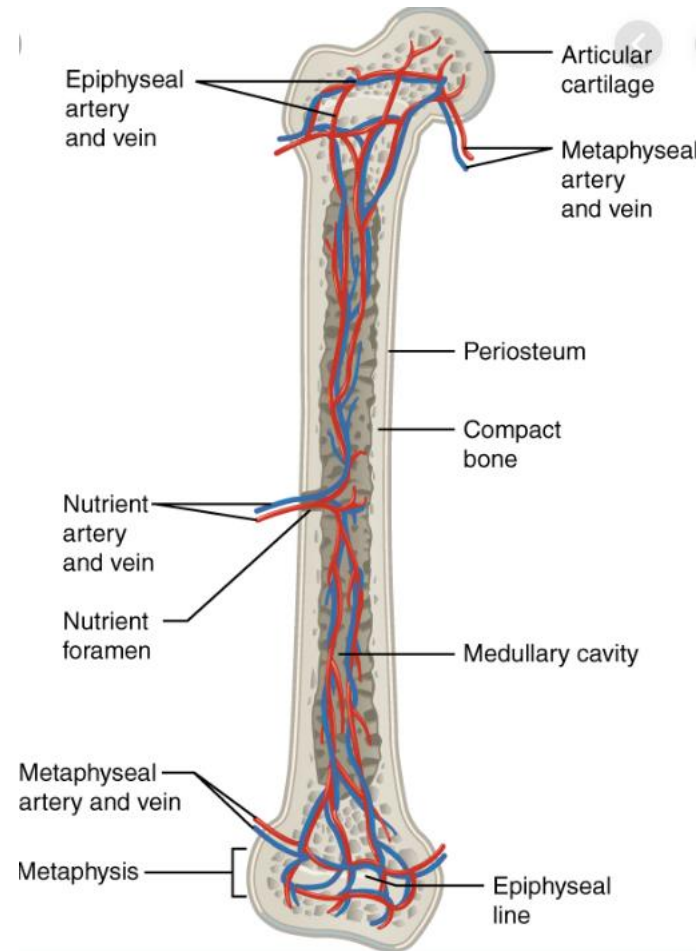
Dr. Mariko Shibata, Bone Health Consultant, Prostate Cancer Centre

# Agenda:

- **About BONES!**
- **Fragility Fractures**
- **Bone Mineral Density Testing**
- **Tips to Keep your Bones Strong**
- **Osteoporosis/Low Bone Mass**
- **Risk Assessment Tools**
- **Prostate Cancer and Bone Health**
- **Clinical Practice Guidelines**
- **Skeletal Related Events (SRE)**
- **Treatment to Prevent SREs**
- **Q & A**

# About BONES!

**Bones are living tissue**



# Bone “breakers” vs “builders”

## Creating new bone:

- **2 main types of bone cells:**
  - Osteoclasts: Break down old bone
  - Osteoblasts: Lay down new bone



# Bone Loss

- A. Occurs when more bone is broken down than repaired**
- B. Peak bone mass occurs between the ages of 18 and 25**
- C. More bone is broken down than is repaired as we age**



# Fragility Fracture

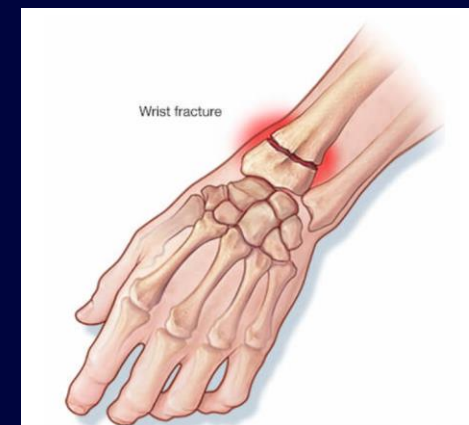
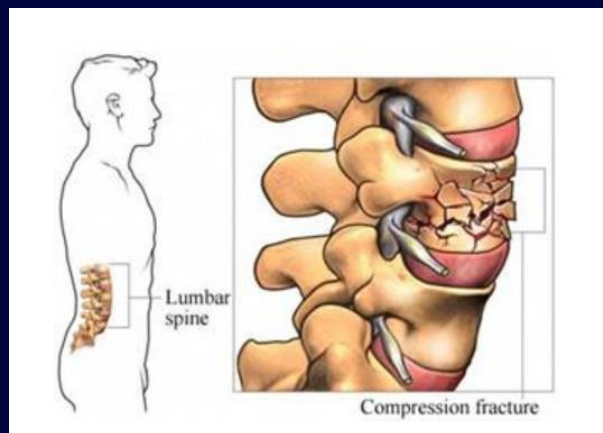
**Fracture that occurs from a minor accident.**

**<https://www.buildingindiana.com/nwi-hospital-recognized-for-fragility-fracture-patient-care>**



# Common sites of fragility fractures

- **Spine** [https://www.physio-pedia.com/Lumbar\\_Spine\\_Fracture](https://www.physio-pedia.com/Lumbar_Spine_Fracture)
- **Hip** <https://stanfordhealthcare.org/medical-conditions/bones-joints-and-muscles/hip-fracture/types.html>)
- **Wrist** <https://sportsmedicine.mayoclinic.org/condition/hand-wrist-fractures/>





# Bone Mineral Density (BMD)

- **DXA – Dual energy x-ray absorptiometry**





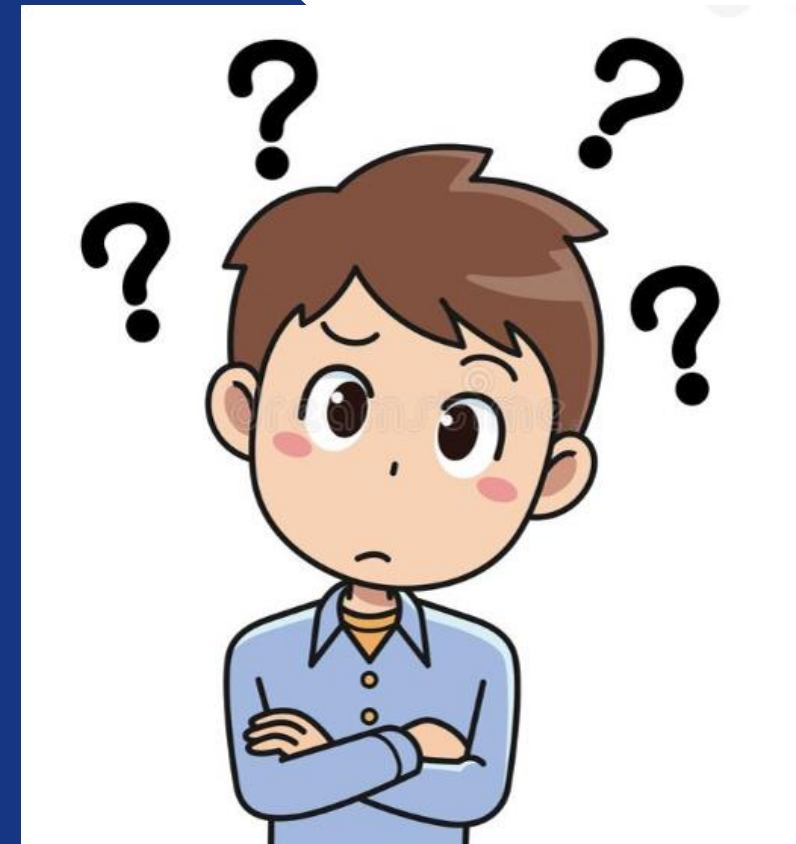
# Bone Density Test Results

- **Results measured by “T-Score” – indicates how much higher or lower your bone density is compared to the bone density of a healthy 30 year old person.**
- **The lower your T-Score, the higher your chance of breaking a bone.**

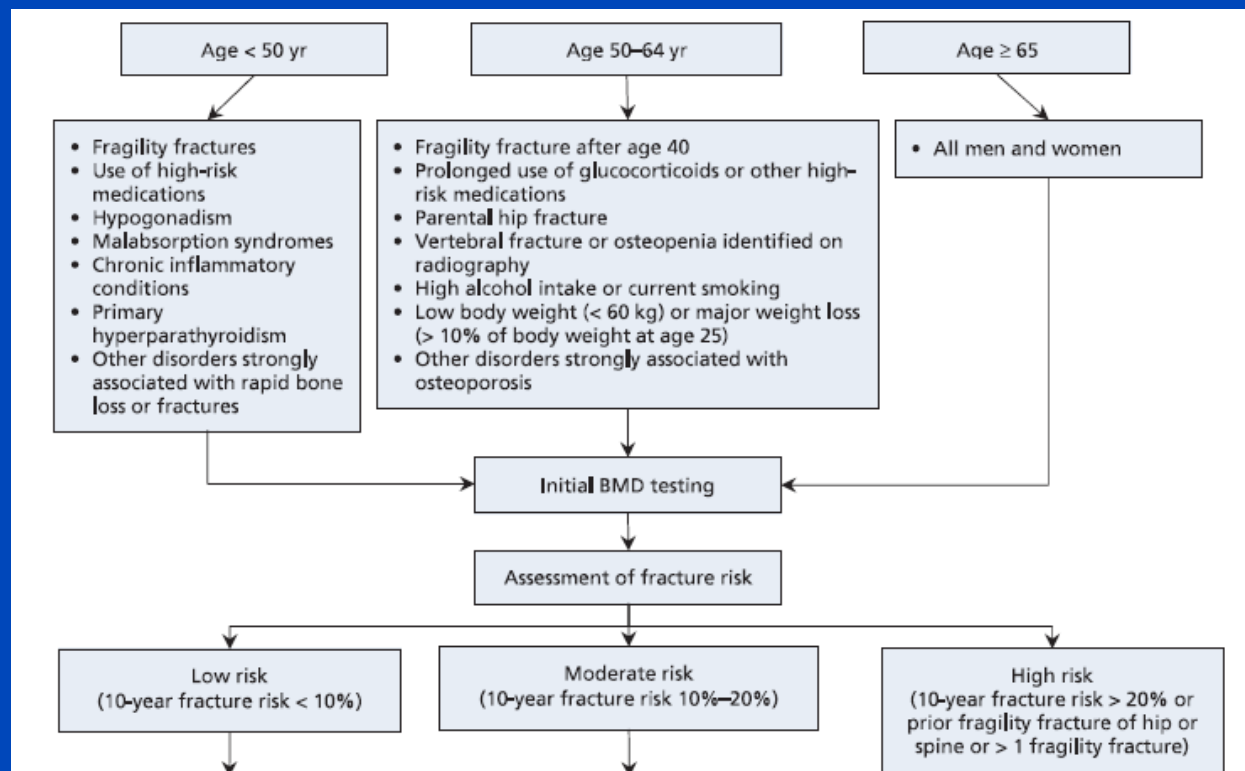
Diagnosis	T-score
Normal	$> -1.0$
Osteopenia	$< -1.0, > -2.5$
Osteoporosis	$< -2.5$
Severe osteoporosis	$< -2.5$ plus fragility fractures

WHO osteoporosis classification

**Do I need to get a BMD done?**



# 2010 Clinical Practice Guidelines for the Diagnosis and Management of Osteoporosis in Canada



Reference: <http://www.cmaj.ca/content/182/17/1864/tab-figures-data>

**INITIATING ANDROGEN DEPRIVATION TREATMENT**



**BMD TO ASSESS BASELINE FRACTURE RISK**

# Factors that contribute to bone loss:

- **Low body weight or a large weight loss since age 25**
- **Low bone mineral density**
- **Increased age: our bones get weaker after age 25 – 30 and get increasingly weaker as we age**
- **Family history of osteoporosis or hip fracture**
- **History of a fragility fracture**
- **History of falls**
- **Oral steroid medications like prednisone**
- **Cancer treatments: Androgen Deprivation Therapy (ADT)**

## **Lifestyle tips to strengthen your bones**

- **Supplement your diet with Calcium and Vitamin D**
- **Get enough protein in your diet**
- **Do more weight bearing exercise**
- **Quit smoking**
- **Limit your intake of alcohol**
- **Limit your intake of caffeine**
- **Limit your salt intake**

# Calcium

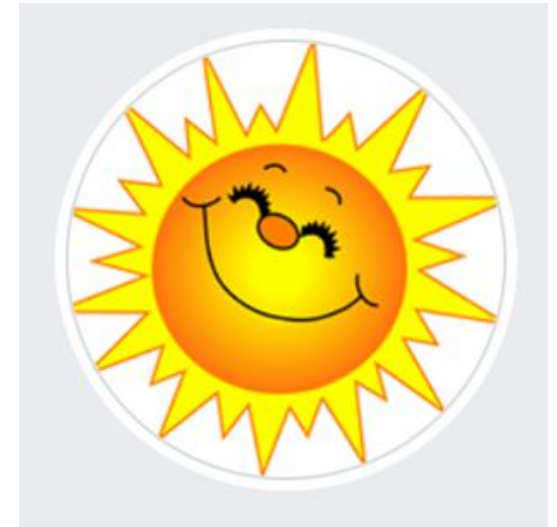
- **99% of the calcium in your body is stored in your bones**
- **If you are not getting enough calcium from your body every day, your body takes it from your bones and teeth**
- **Recommended daily intake = 1200 mg (mostly through diet if possible)**
- **Do not take more than 500 mg at a time**





# Vitamin D

- **Recommended daily dose = 800 – 2000 IU per day**
- **Note: Difficult to get adequate amounts from food**
- **Your body needs Vitamin D to absorb Calcium**
- **Helps improve muscle strength**



# Osteoporosis & Low Bone Mass

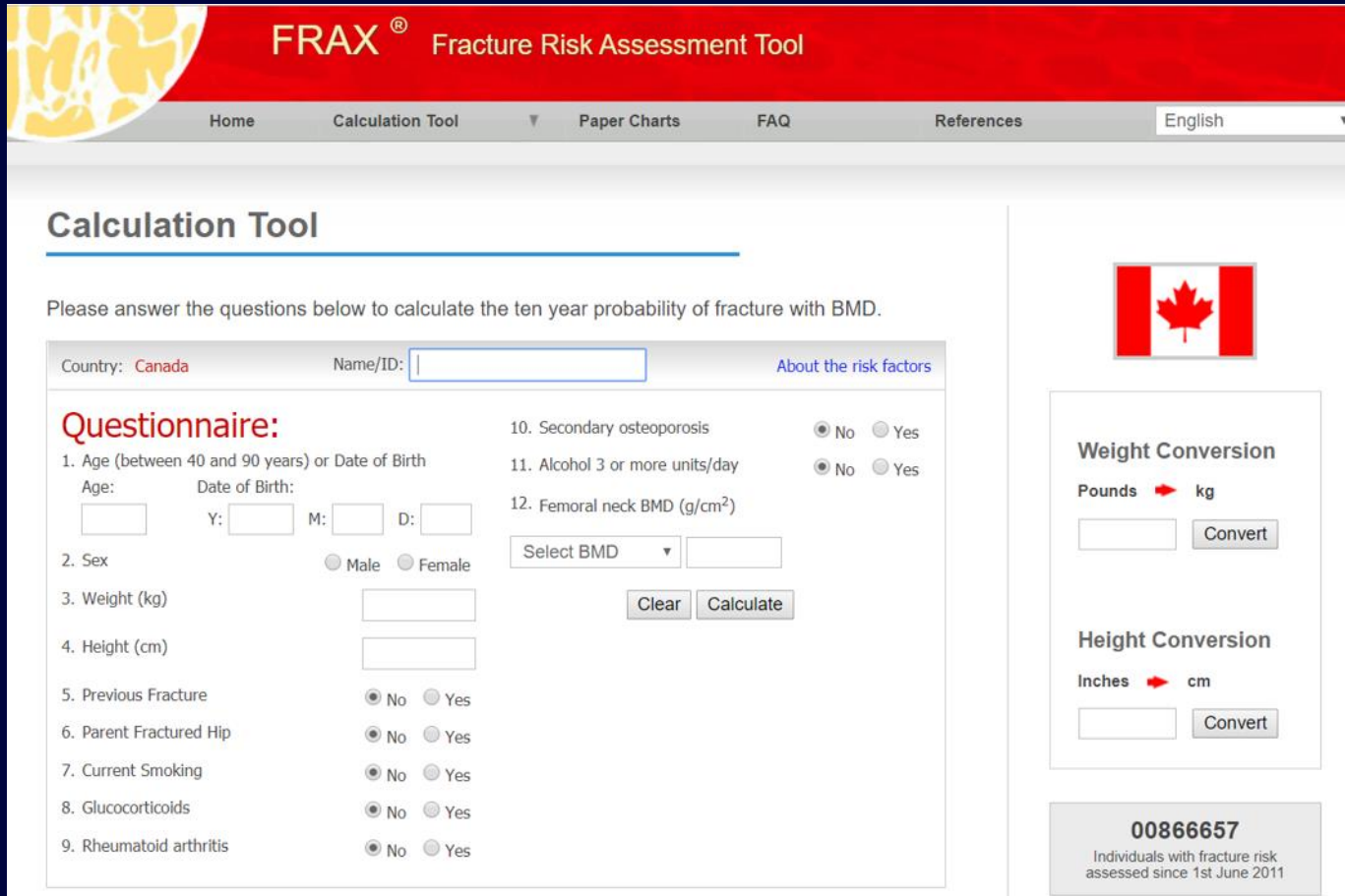
## Osteoporosis

- **A bone disease that quietly weakens bones**
- **Caused by low bone mass and weakened bones**
- **Leads to increased risk of fractures**

## Low Bone Mass

- **Bones are weaker than normal but not expected to break easily, which is the hallmark of osteoporosis.**

# Tools for risk assessment



The screenshot shows the FRAX Fracture Risk Assessment Tool interface. At the top, there is a red header with the FRAX logo and the text 'Fracture Risk Assessment Tool'. Below the header is a navigation menu with links for 'Home', 'Calculation Tool', 'Paper Charts', 'FAQ', and 'References'. A language dropdown menu is set to 'English'. The main content area is titled 'Calculation Tool' and contains a questionnaire. The questionnaire asks for personal information such as age, sex, weight, height, and medical history. It also includes a section for 'Weight Conversion' and 'Height Conversion'. A Canadian flag is displayed on the right side of the form. At the bottom right, there is a contact number '00866657' and a note about the tool's availability since June 2011.

FRAX<sup>®</sup> Fracture Risk Assessment Tool

Home Calculation Tool Paper Charts FAQ References English

### Calculation Tool

Please answer the questions below to calculate the ten year probability of fracture with BMD.

Country: **Canada** Name/ID:  [About the risk factors](#)

#### Questionnaire:

1. Age (between 40 and 90 years) or Date of Birth  
Age:  Date of Birth: Y:  M:  D:

2. Sex  Male  Female

3. Weight (kg)

4. Height (cm)

5. Previous Fracture  No  Yes

6. Parent Fractured Hip  No  Yes

7. Current Smoking  No  Yes

8. Glucocorticoids  No  Yes

9. Rheumatoid arthritis  No  Yes

10. Secondary osteoporosis  No  Yes

11. Alcohol 3 or more units/day  No  Yes

12. Femoral neck BMD (g/cm<sup>2</sup>)  
Select BMD

#### Weight Conversion

Pounds  kg

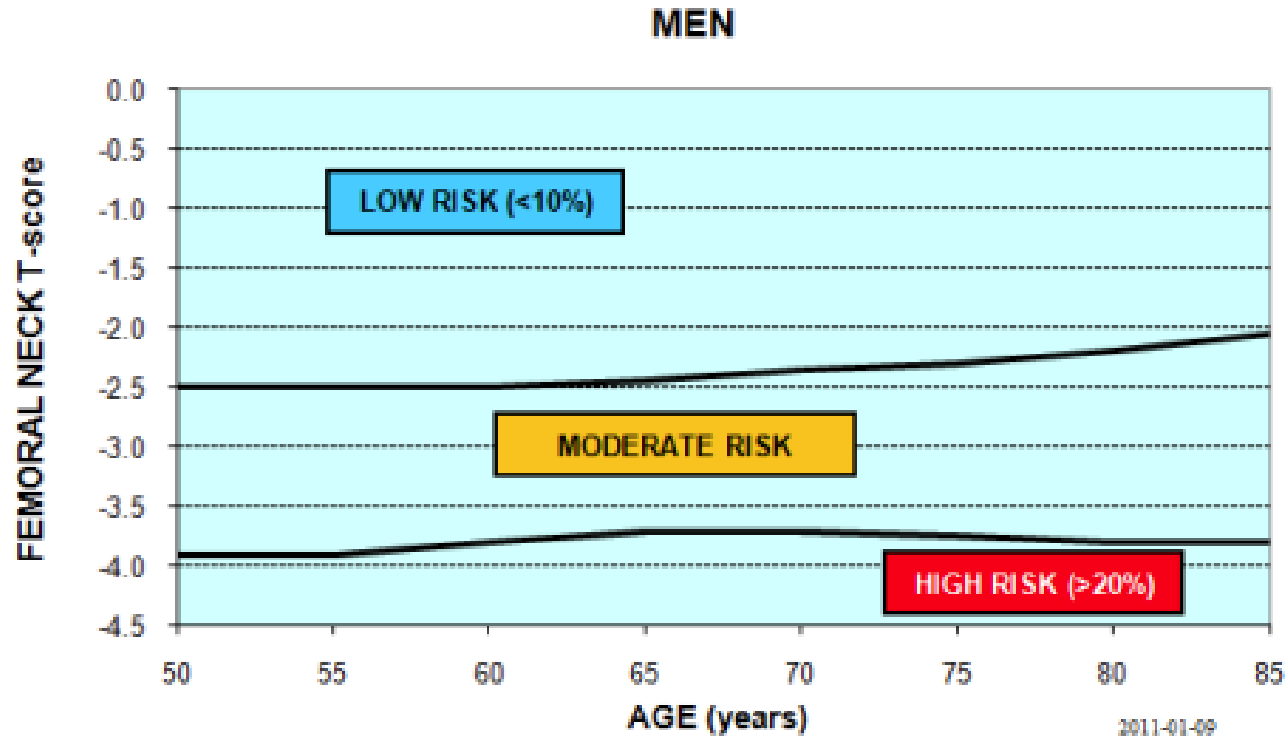
#### Height Conversion

Inches  cm

**00866657**  
Individuals with fracture risk assessed since 1st June 2011

<https://www.sheffield.ac.uk/FRAX/tool.aspx?country=19>

# CAROC System



<https://osteoporosis.ca/wp-content/uploads/CAROC.pdf>

# Bone Health & Prostate Cancer

**Many treatments available for prostate cancer can increase the risk of fracture**

**Androgen Deprivation Therapy (ADT) increases bone loss**

**Decreased threshold for treatment with osteoporotic medication**



# ESMO Clinical Practice Guidelines 2020

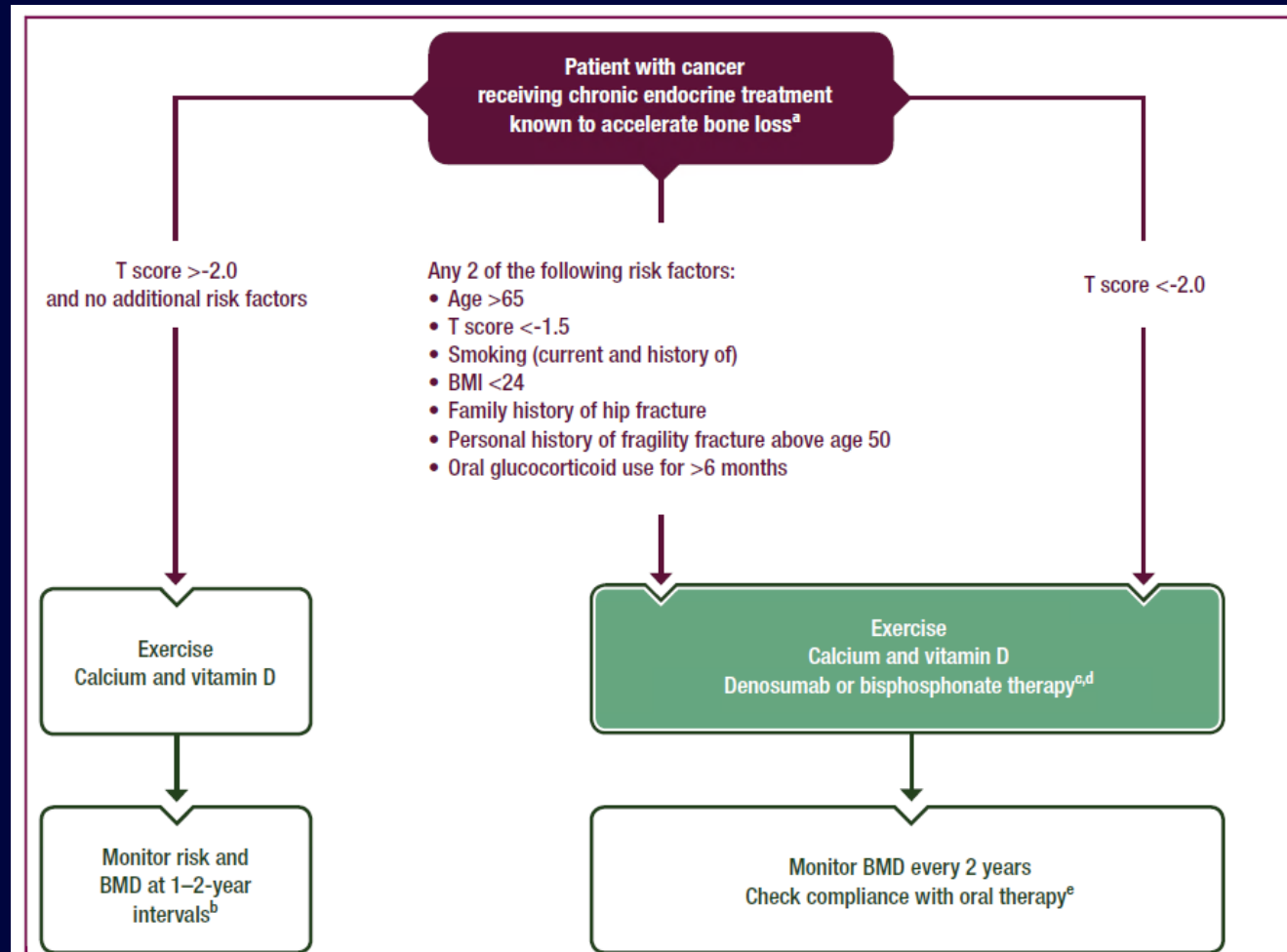
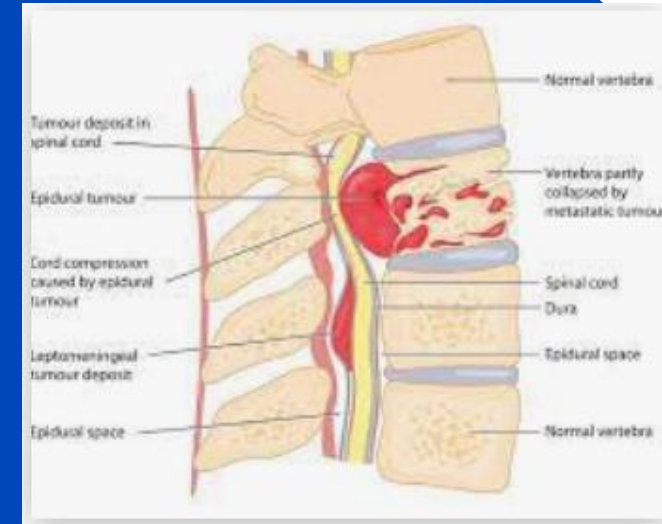


Figure 3. Recommended algorithm for managing bone health during cancer treatment.

# What are Skeletal Related Events (SREs)

- Pathological fracture
- Surgery to bone
- Radiation to bone
- Spinal cord compression

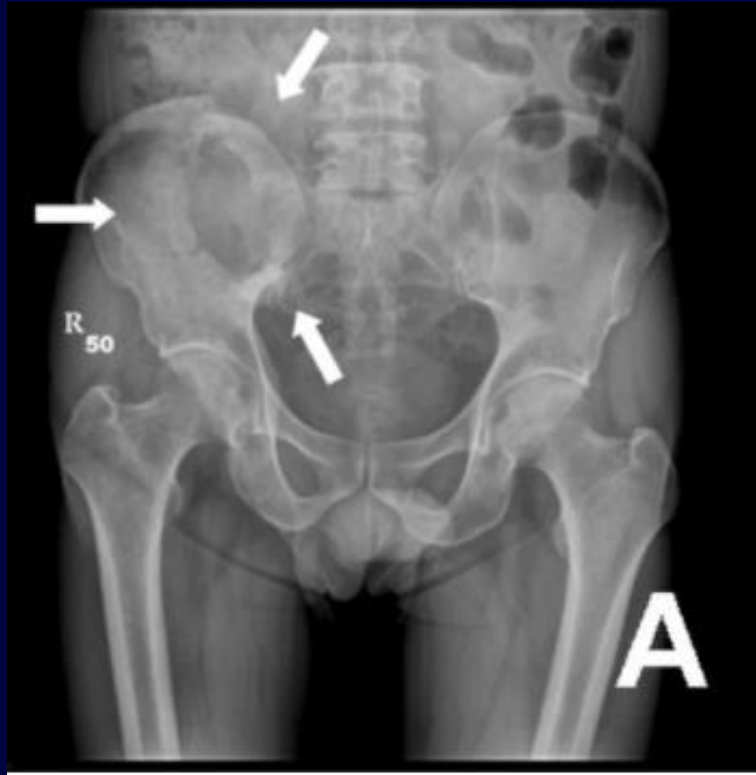




# Why is SRE prevention important?



# What patients are candidates for SRE prevention?



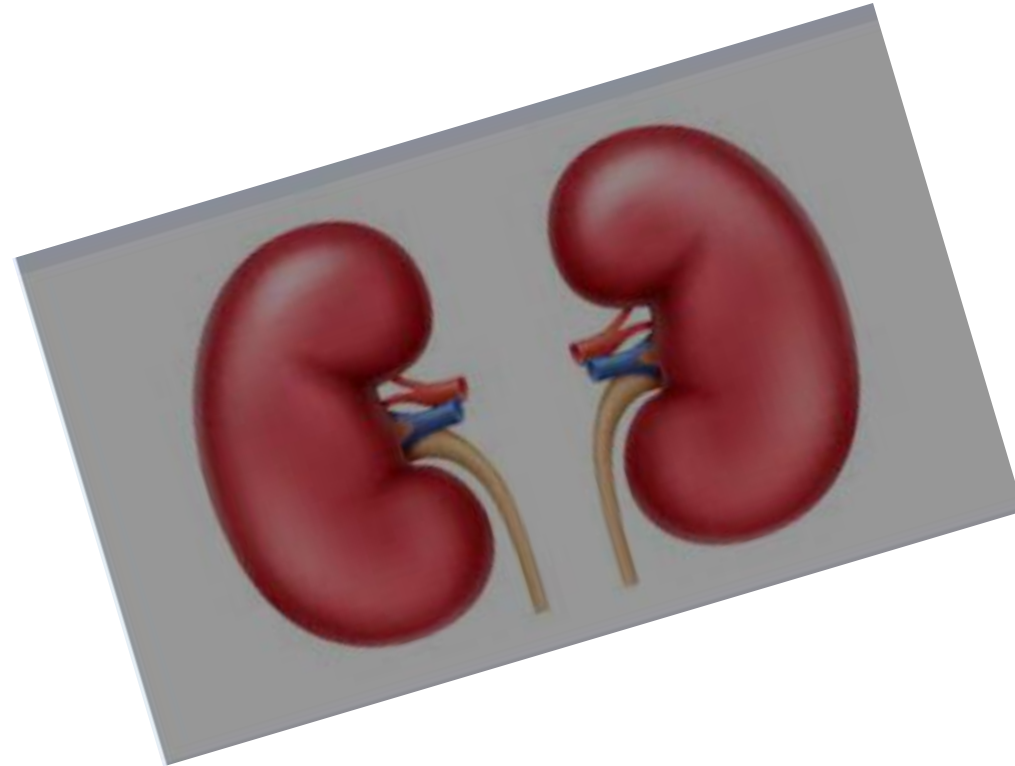
# Recommended treatments

- **Zoledronic acid by intravenous infusion every 4 to 12 weeks**
- **Denosumab by subcutaneous injection every 4 weeks**



# Treatment Risks

- **Osteonecrosis of the jaw**
- **Impaired kidney function**
- **Low calcium levels**



# Questions?



# Resource Information

- **Calgary Prostate Cancer Centre**
  - [www.prostatecancercentre.ca](http://www.prostatecancercentre.ca)
  - Bone Health Clinician, 403.943.8946