

Refracture prevention: Role of primary care

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Overview

- Definition and impact on society
- Capture the fracture
- High Risk individual identification

Overview

- Definition and impact on society

World Health Organization Definition of Osteoporosis

- Systemic skeletal disease characterised by:
 - Low bone mass
 - Microarchitectural bone tissue deterioration

Resulting in

- Decreased bone strength
- Increased fracture risk

Kanis JA, et al. J Bone Min Res. 1994;9:1137-41

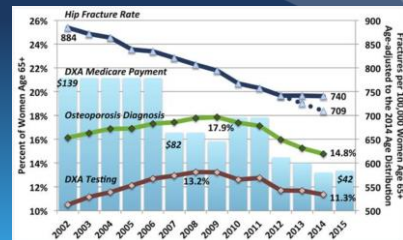
Burden of poor bone health in SA

- ~ 433,000 Australians > 50: osteoporosis / osteopenia

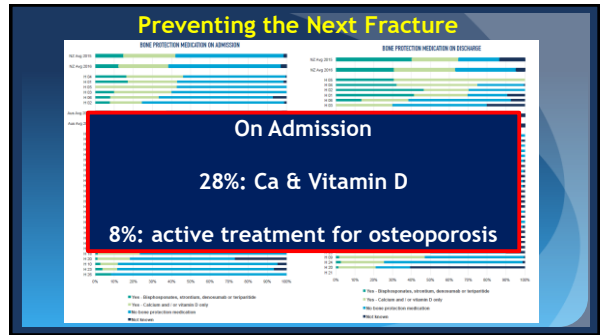
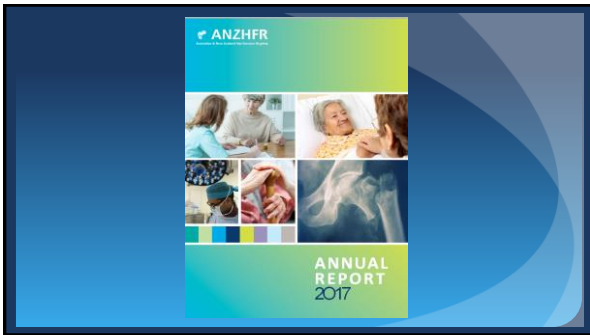
**Osteoporosis is
common & costly**

- Direct & indirect costs - \$1.8 billion > 10 years

A new burden of disease analysis - 2012 to 2022. 2017, Osteoporosis Australia



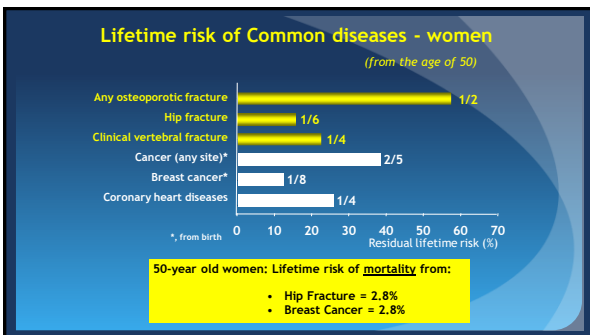
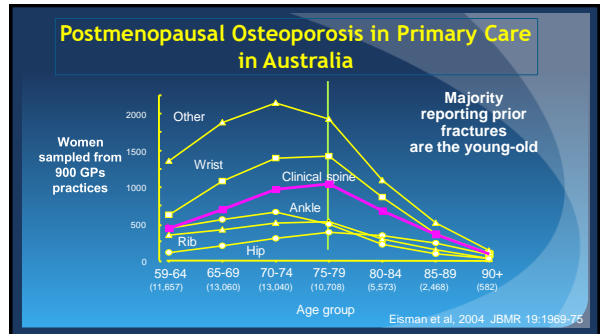
Lewicki et al. # 1077 ASBMR 2016



A missed opportunity for intervention?

- 75–80% of patients with a minimal trauma fragility fracture have been neither investigated nor treated for osteoporosis¹
- The Australian Bone Care Study of postmenopausal Australian women attending GP clinics found 29% reported at least one low trauma fracture after menopause; of these:²
 - Only 25% were told they had osteoporosis
 - 72% were not on any specific osteoporosis therapy

1. Sibbel M, Med J Aust 2011;195:988-97. 2. Eisman A, et al. J Bone Miner Res 2004;19:1969-76.

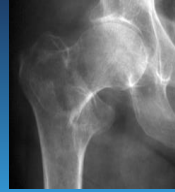


Overview

- Capture the fracture

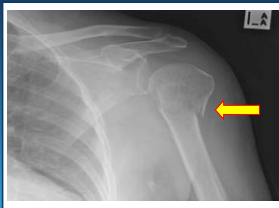
- The presence of a minimal trauma fracture in a postmenopausal women or middle aged man is most likely due to osteoporosis.
- Majority of these patients require treatment.

Osteoporotic Fractures



Peripheral fractures are usually easily detected.

Osteoporotic Fractures



Osteoporotic Fractures ?

Hmmm...
It's possible
but I want
more
evidence



Osteoporotic Fractures ?

Hmmm...
Very
unusual.
Not
convinced
at all.

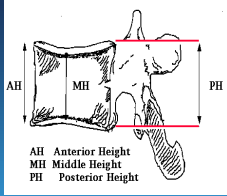


Identifying Patients with Vertebral fractures

- The majority of vertebral fractures do not come to clinical attention.
- Many vertebral fractures are asymptomatic. They can develop abruptly, or slowly over a period of time.
- The significance of back pain due to vertebral fractures is often not appreciated.
- Vertebral fractures increase significantly the risk of further osteoporotic fractures, including hip fracture.

The Royal Australian College of General Practitioners and Osteoporosis Australia. Osteoporosis prevention, diagnosis and management in postmenopausal women and men over 50 years of age. RACGP, 2017. Sambrook P, Cooper C. Lancet 2006;367:2010-18

Vertebral Fractures Quantitative Morphometry



Height Ratios

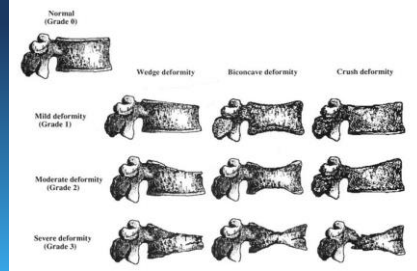
1. AH:PH
2. MH:PH
3. Any height to the corresponding height of an adjacent vertebra.

Fracture Definition

Mild	20 -25%
Moderate	25 - 40%
Severe	> 40%

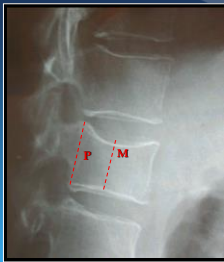
Genant et al

Visual or Semi-quantitative Assessment



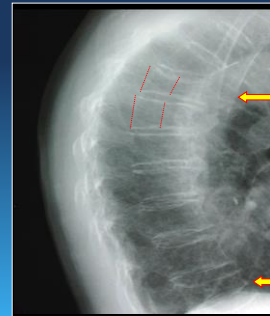
Genant et al 1993, JBMR 8(9): 1137-1148

Vertebral Fracture ?



P = 30 mm
M = 23 mm
M/P = 0,77

Vertebral Fracture ?



P1 = 24 mm
P2 = 30 mm
P1/P2 = 0,80

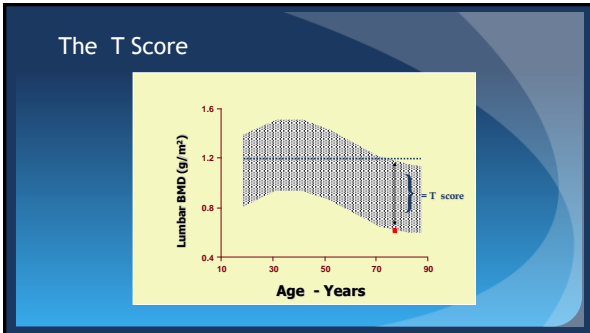
M1 = 26 mm
M2 = 20 mm
M1/M2 = 0,77

Osteoporosis !!



Overview

- High Risk individual identification



WHO CLASSIFICATION

Definition	Criteria
Normal	T-score ≥ -1
Osteopenia (low bone mass)	T score between -1 and -2.5
Osteoporosis	T-score < -2.5 sd
Established / severe osteoporosis	Osteoporosis with one or more fragility fractures

A T-score of less than -2.5 identifies approximately 30% of post-menopausal women as having osteoporosis, using measurements at the spine, hip or mid-forearm. This is approximately equivalent to the lifetime risk of fracture at these sites (Kanis et al J Bone Miner Res 1994; 9: 1137)

WHO Technical Report Series 1984, No.843.

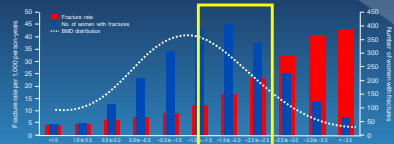
- ### Who should have a DXA?
- Age > 50 yrs with risk factors
 - Minimal trauma fracture
 - Medications associated with accelerated bone loss
 - Glucocorticoids
 - Aromatase inhibitors
 - Androgen deprivation therapy
 - Medical conditions associated with increased bone loss
 - Thyrotoxicosis
 - Hyperparathyroidism

- ### Who to investigate further?
- Clinical assessment
 - Minimal trauma fractures but good BMD
 - Low Z scores
 - Bone loss exceeding 2% per annum (Be aware of precision error - more significant with longer intervals between scans)

Common Causes of Secondary Osteoporosis

- Hyperthyroidism
- Hyperparathyroidism
- Glucocorticoid therapy
- Vitamin D insufficiency
- Coeliac disease / Malabsorption
- Hypogonadism (including drug induced)
- Monoclonal gammopathy of unknown significance (MGUS)/ Myeloma

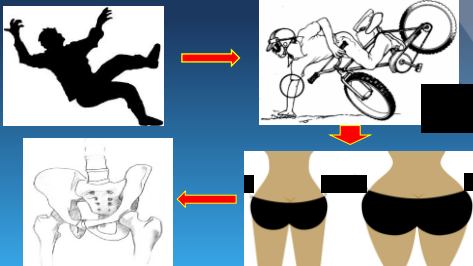
Majority of osteoporotic fractures occur in 'osteopenic' women (T-Score -1.0 to -2.5)



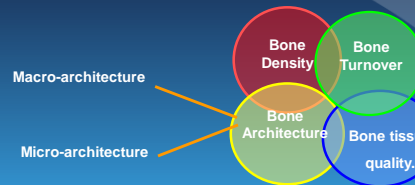
Fracture rate increases ~2-fold in osteopenic women

Osteoporosis = minimal trauma fracture and low bone mass (T-score < -1.0 (osteopaenia/osteoporosis on WHO criteria) or T score < -2.5 alone)

Look out for High Fracture Risk Individual



Look out for High Fracture Risk Individual



Relative Risk

- Age matched peers (Z score).
- Young normals (T score).

Absolute Risk

- Risk of fractures in a given time period. (% or no of fractures).
- One, five or ten year risk etc or as remaining lifetime fracture risk.



Absolute Fracture Risk

Calculation Tool

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

Country: **Australia** Name/ID: _____ About the risk factors

Questionnaire:

- Age (between 40 and 90 years) or Date of Birth: **70** (circled in red)
- Sex: Male Female
- Weight (kg): **65**
- Height (cm): **165**
- Previous Fracture: No Yes
- Parent Fractured Hip: No Yes
- Current Smoking: No Yes
- Glucocorticoids: No Yes
- Rheumatoid arthritis: No Yes
- Secondary osteoporosis: No Yes
- Alcohol 3 or more units/day: No Yes
- Femoral neck BMD (g/cm²): **-2.5** (circled in red)

Clear Calculate

FRAX: 23.9% 10-year probability of fracture (%)

Major osteoporosis: **7.7%**

Hip Fracture: **2.2%**

If you have a TBS value, click here:

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FRACTURE RISK CALCULATOR

Burden of Osteoporosis Epidemiology Study
The Fracture Risk Calculator has revealed some key findings on the increasingly common public health problem of osteoporosis in Australia, including that 25% of men in Australia could roughly halve their risk of fracture by taking calcium supplements.

Supporters:
This study has been supported by several international groups:
Amgen Australia
Novartis
Pfizer
Roche
Sandoz
Schering-Plough
Teva
Valeant
Zinc Nutrition

Donations:
Help us continue our research. For more information, contact us at info@garvan.org.au

Absolute Fracture Risk

Calculation Tool

Fill out the following to estimate your fracture risk

Full Name: _____ Sex: Male Female

Age: **70** (circled in red)

Fractures since the age of 50 including major trauma, e.g. car accidents: **0**

Falls over last 12 months: **0**

Do you have a Bone Mineral Density (BMD): Yes No

T-score: **-2.5** (circled in red)

5 & 10 year Fracture Risk For Test

Prepared 2-Mar-09

Hip Fracture 4.4% 5 year risk	8.6% 10 year risk	Any Osteoporotic / Fragility Fracture 12.6% 5 year risk	25.1% 10 year risk
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The following values are equivalent to those at which current Pharmaceutical Benefits Scheme reimbursements for osteoporosis therapy apply.

Hip Fracture		Any Osteoporotic / Fragility Fracture	
2-5% 5 year risk	3-9% 10 year risk	8-13% 5 year risk	14-26% 10 year risk

Osteoporosis risk assessment, diagnosis and management

RACGP Osteoporosis Australia

Minimal trauma hip or vertebral fracture

DXA of spine and/or forearm (T-score < -2.5)

No history of minimal trauma fractures

History of minimal trauma fractures

High 10-year risk of fracture

Low to moderate risk of fracture

Values treatment with anti-osteoporosis medication

Not treated or not recommended

2017 RACGP /OA Osteoporosis Treatment Guidelines Summary

- Osteoporotic hip or vertebral fractures, Non hip and non vertebral fractures with $T < -1.5$
- DXA defined osteoporosis ($T \leq -2.5$)

OR

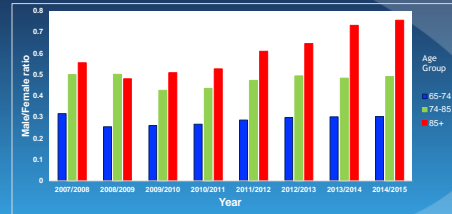
- T-scores from -1.0 to -2.5 and Garvan or FRAX scores that indicate 3% 10-year risk for hip fracture or 20% 10-year overall osteoporotic fracture risk

Osteoporosis International October 2014, Volume 25, [Issue 10](#), pp 2359–2381

Male osteoporosis

- 1 in 5 men aged > 50 osteoporotic fracture in lifetime
- - 30% of hip fractures
- Same rate of age-related bone loss as women
- < 10 % of men with osteoporosis are getting treated

Men:Women Per Capita DXA scanning



Take home messages

- Osteoporosis common & costly
- Undertreated
- Don't ignore the first fracture
- Identify high risk patients
- Initiate Treatment early