Learning Objectives

• Identify a wrist fragility fracture

• Identify associated risks and health consequences of fragility fractures

• Evaluate the benefit of a fragility fracture program for your practice
Informal poll

Osteoporosis: The Battle for Your Bones
Question 1

I treat osteoporotic/osteoporotic fractures in my practice:

• Routinely
• Occasionally
• Rarely
• Not at all
Question 2

I obtain DXA scores in patients who have had a suspected fragility fracture:

• Routinely
• Occasionally
• I refer back to primary care doctor to obtain it
• Never thought about it
• Never, it’s not my role
Question 3

A fragility fracture is:

• A fall from a standing height
• A pathologic fracture
• A fracture that would not typically occur in a healthy person
• All of the above
Definitions

Insufficiency Fracture

• Bone fails with normal weight bearing
Definitions

Fragility Fracture

• Women older than 40 and men older than 50 who sustain a fracture when falling from a standing height or less
OSTEOPOROSIS DEFINITION

NIH Conference

“A skeletal disorder characterized by compromised bone strength predisposing to an increased risk of fracture. Bone strength reflects the integration of two main features: bone density and bone quality.”

*JAMA* 2001;285:785
Definitions

Osteoporosis

• (WHO): Bone mineral density more than 2.5 SD below the mean
WHO, Guidelines for Preclinical Evaluation and Clinical Trials in Osteoporosis, 1998
“Elderly”...

- Is a relative term
- As is *health*, *wealth*, and *welfare*
What to do?

87 y.o. nun with severe aortic stenosis

• On coumadin, sedentary
• Hand use: knitting, TV remote
Provisional reduction - traction and splint
Compare and contrast

http://farm1.static.flickr.com/34/94787861_5227ca9931.jpg?v=0
Question 3

A fragility fracture is:

• A fall from a standing height
• A pathologic fracture
• A fracture that would not typically occur in a healthy person
• All of the above
What are associated risks and health consequences?
FRAX is:

- A method of laser resurfacing for removing fine facial lines
- An indicator of fracture severity and prediction
- A geometric shape or patterns such as a snowflake
- A transdermal delivery system to prevent osteoporotic fractures
FRAX

By Doctot

Open iTunes to buy and download

Predicts “absolute fracture risk”

Uses risk factors and DXA in calculation

$5.99
iPhone Screenshots

FRAX Selected Score

Apr 28, 2010
Marie Smith

BMI 24.5
With BMD
Major Osteoporotic 8.4
Hip Fracture 1.3

Country of Origin
UK
Age
77
Sex
Female
Weight
74.5 kgs
Height
174.5 cms
Previous Fracture
No
Parent Fractured Hip
No

NOGG Guidance

Intervention Threshold

Major Fracture - 10 year fracture probability

Interpretation

...
Question 4

FRAX is:

- A method of laser resurfacing for removing fine facial lines
- An indicator of fracture severity and prediction
- A geometric shape or patterns such as a snowflake
- A transdermal delivery system to prevent osteoporotic fractures
Question 5

Peak Bone Mass occurs:

- By age 35
- By early 20s
- By age 5
- By age 75
LIFETIME BONE MASS FEMALES

AGE

Fracture Risk

HIGH

LOW

BONE MASS

LOW

10 20 30 40 50 60 70 80 90 100

HIGH

LOW
Question 5

Peak Bone Mass occurs:

• By age 35
• **By early 20s**
• By age 5
• By age 75
Question 6

Mortality rate of men compared to women after hip fracture is:

a. The same (10%)
b. Double (20%)
c. Half (5%)
d. Non-existent (0%)
Osteopenia - Osteoporosis

- Wrist before spine/hip
- Caucasian female has competition
- Mortality high 10-20% with hip fx
- Associated co-morbidities of osteoporosis
Question 6

Mortality rate of men compared to women after hip fracture is:

- a. The same (10%)
- b. Double (20%)
- c. Half (5%)
- d. Non-existent (0%)
What are the benefits of a fragility fracture program?
DXA (Dual-energy X-ray Absorptiometry) is:

- A detailed picture of bone volume (cortical and cancellous)
- An accurate T-score assessment in children
- An accurate tool for assessing the distal radius
- A combination of 2 scores: T-score (compares Peak Bone Density) and Z-score (compares sex and age)
Question 7

DXA (Dual-energy X-ray Absorptiometry) is:

• A detailed picture of bone volume (cortical and cancellous)
• An accurate T-score assessment in children
• An accurate tool for assessing the distal radius
• A combination of 2 scores: T-score (compares Peak Bone Density) and Z-score (compares sex and age)
The role of nutrition and exercise in bone health is:

- Over-rated
- Significant, especially in pediatric population
- Not as important as bisphosphonate use and newer anabolic treatments
## RISK FACTORS FOR OSTEOPOROSIS

### NON MODIFIABLE
- Female, postmenopause
- Advanced age
- History fragility fx
- Caucasian>Asian>Hispanic>African American
- Hx fracture/osteoporosis in 1st degree relative
- Western Europe heritage
- Thin, <125 lbs.
- Connective tissue disease

### MODIFIABLE
- Smoking, excess alcohol
- Low Ca diet
- Low Vit D
- Eating Disorder
- Inactivity
- Meds: glucocorticoids
- Excess exercise
- amenorrhea
Question 8

- The role of nutrition and exercise in bone health is:
  - Over-rated
  - Significant, especially in pediatric population
  - Not as important as bisphosphonate use and newer anabolic treatments
The incidence of a Caucasian woman sustaining a fragility fracture in her lifetime is:

- 10%
- 25%
- 50%
- 75%
Fractures cost: >$19 billion/yr
Increase expected if no action

<table>
<thead>
<tr>
<th>Fracture Type</th>
<th>Annual Incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wrist</td>
<td>400,000</td>
</tr>
<tr>
<td>Vertebral</td>
<td>550,000</td>
</tr>
<tr>
<td>Hip</td>
<td>350,000</td>
</tr>
<tr>
<td>Pelvic</td>
<td>125,000</td>
</tr>
<tr>
<td>Other</td>
<td>675,000</td>
</tr>
<tr>
<td>Stroke</td>
<td>795,000</td>
</tr>
<tr>
<td>Heart Attack</td>
<td>295,000</td>
</tr>
<tr>
<td>Breast Cancer</td>
<td>207,000</td>
</tr>
</tbody>
</table>

Heart Disease and Stroke Statistics — 2009 Update, American Heart Association.
JOURNAL OF BONE AND MINERAL RESEARCH
Volume 22, Number 3, 2007
Published online on December 4, 2006; doi: 10.1359/JBMR.061113
Question 9

The incidence of a Caucasian woman sustaining a fragility fracture in her lifetime is:

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- 25%
- 50%
- 75%
Treatment

• Bisphosphonates?
• Diet?
• Exercise?
What are co-morbidities that complicate treatment?

Health, wealth, and welfare influence treatment choice

• Operative treatment inherently complex
• Timing of surgery
• Polytrauma
Aggressive Treatment: Are We Helping or Hurting our Patients?

Hurting

• Continued evidence “they all do well” left alone
• High complication rate > 30 % open treatment

Helping

• Orthopaedists often first to diagnose osteoporosis
• Uniquely poised to make a difference
Should we be fixing elderly fractures?

Are we not aggressive enough?

- Operative vs. nonoperative comparison inconclusive (Handoll, Hegeman)
- Undertreated, especially in younger populations (Wigderowitz)
Question 10

• DXA (Dual-energy X-ray Absorptiometry) is a good predictor for:
  • Future distal radius fracture
  • The quality of distal radius bone
  • Vitamin D levels
  • Rate of bone turnover
Question 10

- DXA (Dual-energy X-ray Absorptiometry) is a good predictor for:
  - Future distal radius fracture
  - The quality of distal radius bone
  - Vitamin D levels
  - Rate of bone turnover
The optimal distal radius fracture treatment in displaced fragility fracture is:

• Locking screw and plate constructs
• Percutaneous pin fixation
• External fixation
• Non-operative treatment
• None has sufficient level I evidence to favor one isolated treatment over another
Question 11

The optimal distal radius fracture treatment in displaced fragility fracture is:

- Locking screw and plate constructs
- Percutaneous pin fixation
- External fixation
- Non-operative treatment
- None has sufficient level I evidence to favor one isolated treatment over another
And what happened to...?
What to do?

87 y.o. nun with severe aortic stenosis
- On coumadin, sedentary
- Hand use: knitting, TV remote
Provisional reduction - traction and splint
Elderly...

- Is a relative term
- Describes someone older than you
Conclusions

- Wrist fragility fractures are a barometer of general health
- Women are most commonly affected
- Men often underdiagnosed
- We are poised to make a difference

Thank you