

OSTEOPOROSIS: Diagnosis and Management

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Our case last week: Mrs. B

- 87 year old white female at local ALF
- She was getting ready for bed in her slippers
- Usually walks with a rolling walker
- Fell near her bed
- No dizziness, CP, SOB
- Had immediate pain in her left hip
- 911 called

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Her xray

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Why do we break our hips???

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Another hip fracture. Big deal???

- Yes, it is...
- One year mortality is 8-36%
 - Worse in men
- 50% never walk again without assistance
- 25% need long term care

HIP FRACTURE IS THE MOST DEVASTATING CONSEQUENCE OF OSTEOPOROSIS

Haentjens ,et al:Ann Int Med 152:380-390 (2010)
www.ncof.org

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Mrs. B:

- She did well with ORIF
- Needed one unit PRBCs for postop anemia
- Mild postop delirium
- She went to the skilled rehab facility on POD#4

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Slide 4

n1

Please make the mineral loss area look like big holes without lighter streaks

nrianon, 9/16/2012

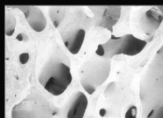
Mrs. B:

- She now presents to your office 3 months later
- Walking slowly with a rolling walker
- Her daughter asks if her mother has osteoporosis, and what can be done?
- Now what??

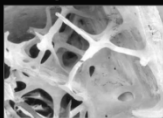
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Osteoporosis: Definition

Normal Bone



Osteoporotic Bone



©2005, David W. Dempster, PhD

NIH Definition:

"Osteoporosis is defined as a skeletal disorder characterized by compromised bone strength predisposing a person to an increased risk of fracture"

1. NIH Consensus Development Panel on Osteoporosis Prevention, Diagnosis, and Therapy. JAMA. 2001;285:785-795.

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Osteoporosis Risk Factors

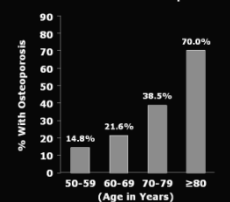
<ul style="list-style-type: none"> • Increasing age • Female gender • Early menopause • Low body weight • Previous fracture • Family history • Low calcium intake 	<ul style="list-style-type: none"> • Low vitamin D • Alcohol • Smoking • Physical inactivity • High caffeine intake • Glucocorticoids <ul style="list-style-type: none"> • COPD/asthma/ RA • White or Asian race
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Osteoporosis is Common Among US Women

- ▶ 10 million Americans have established osteoporosis, 80% of whom are women¹
- ▶ 1.5 million fractures occur per year in US

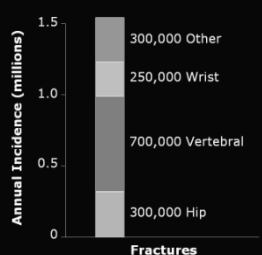
Females in General Population²



1. National Osteoporosis Foundation (NOF). Available at: <http://www.nof.org/osteoporosis/diseasefacts.htm>. Accessed August 13, 2007. 2. Melton LJ III. J Bone Miner Res. 1995;10:175-177.

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Annual Incidence (US) of Osteoporotic Fractures



National Osteoporosis Foundation. Available at: <http://www.nof.org/osteoporosis/diseasefacts.htm>. Accessed August 13, 2007.

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Vertebral Fractures Have Significant Consequences for Patients, Including Dorsal Kyphosis

Vertebral Fractures

- ▶ Associated with
 - Acute and chronic pain
 - Kyphosis and height loss
 - Impaired function
 - Increased morbidity and mortality
 - Increased fracture risk





Image reprinted with permission from Whitehead RI, et al. A Slide Atlas of Menopause. London, UK: Parthenon Publishing Group; 1993. Delmas PD, et al. J Bone Miner Res. 2005;20:557-563.

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Detecting Osteoporosis



- DEXA is easy, painless
- Covered under Medicare every 2 years
- Can confirm diagnosis and direct treatment

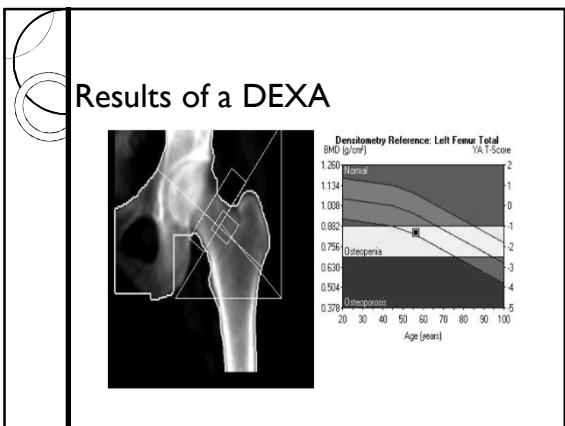
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Detecting Osteoporosis

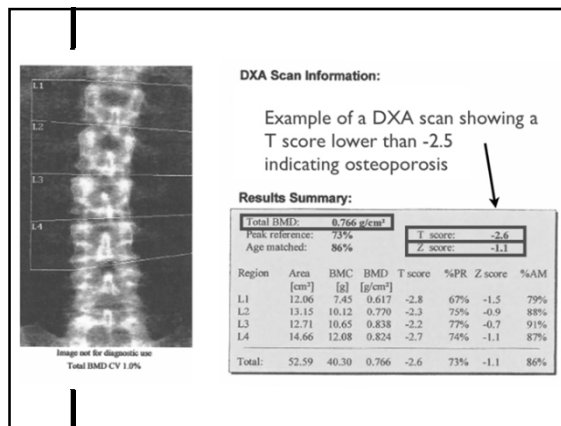


- Check height annually
- Wall mounted ruler preferred

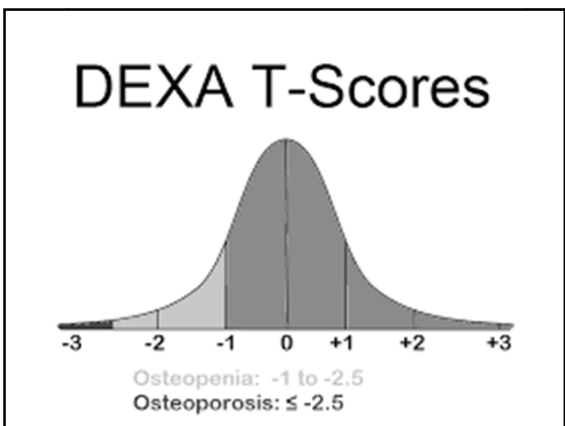
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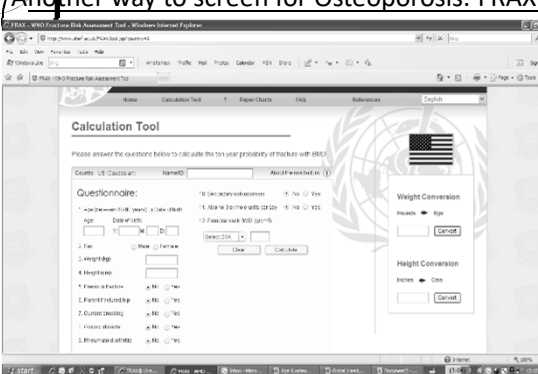


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Another way to screen for Osteoporosis: FRAX



The screenshot shows the FRAX Calculation Tool interface. It includes a questionnaire with fields for Country, Age, Sex, Weight, Height, and various risk factors (previous fractures, glucocorticoid use, rheumatoid arthritis, alcohol intake, and smoking status). There are buttons for 'Calculate' and 'Print'.

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A few tips on the FRAX calculator:

- May be useful to do with a patient who is reluctant to consider OP treatment
- It is not a valid if pt has had previous bisphosphonate therapy
- Take with a grain of salt as it has some limitations

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So the DEXA shows Osteopenia:

<p><u>Weight bearing exercise</u></p> <ul style="list-style-type: none"> • Stimulates bone formation • 2.5 to 4 hours/week of moderate to severe intensity physical activity* 	<p><u>Environmental/Behavioral</u></p> <ul style="list-style-type: none"> • Fall prevention • Improve balance and gait- PT/OT • Smoking cessation • Avoid risk level alcohol use • Avoid benzodiazepines • Avoid flexion in patients with risk of or hx of vertebral fracture
<p><u>Calcium and Vitamin D</u></p> <ul style="list-style-type: none"> • Daily dose 	



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So the DEXA shows Osteoporosis:

- Basic labs
 - CBC
 - CMP with GFR
 - TSH
 - Vitamin D
 - PTH
- If something is not “right”, refer to Rheumatology for evaluation of secondary causes

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So the DEXA shows Osteoporosis:

- Start treatment if
 - Any osteoporotic fracture
 - Hip, vertebral, pelvic, wrist
 - The T score is less than -2.5
 - Postmenopausal women and men over 50
 - if FRAX score suggests 20 % risk of any fx, or 3% risk of hip fx

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OP Pharmacological Treatments

- Bisphosphonates are the most common medications prescribed for osteoporosis treatment.
 - Alendronate (Fosamax®)-once a week
 - Risedronate (Actonel®)- once a week
 - Ibandronate (Boniva®)- once a week
 - Zoledronic acid (Reclast®)
 - Once a year IV infusion

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Issues with Bisphosphonates

Adverse events// Contraindications


- **NONCOMPLIANCE!!**
 - Nonintentional but directions are hard
 - Severe GERD/gastritis/ history of GI bleed
 - Unimproved BMD despite treatment

Current recommendations are to treat with bisphosphonates for 5 years, no more.

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Rare but well-known side effects

- Atypical thigh bone fractures
 - 10-40/100,000
- Jaw necrosis
 - 1/100,000
- This makes our job more difficult
- Remember:
 - NNT=50
 - NNH=40,000
 - From NYTimes 7/11/16, Kalota



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Other Treatment Options

- **Bisphosphonates**
 - See previous slide
- **Calcitonin**
 - Nasal spray
 - Short-term for pain after vertebral fracture
 - No side effects but does not build bone
- **Teriparatide (Forteo®)**
 - Recombinant human PTH
 - 20 mcg SQ daily
 - Contraindicated in cancer patients
 - Costs ~\$3000 a month
- **Denosumab (Prolia®)**
 - Humanized monoclonal antibody
 - 60 mcg SQ every 6 months
 - Usually given in doctors office for insurance coverage since each injection is \$1200

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Rheumatology

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Hormones as Treatment Options


- **SERMs**
 - Raloxifene (Evista®)
 - not commonly used because it increases risk of DVT
 - Less effective
- **Testosterone**
 - If hypogonadism is the cause of osteoporosis
 - Refer to Endocrinology
- **Estrogen/Progestin (Prempo)**
 - Not encouraged due to increased risk of breast cancer, stroke, DVT and coronary diseases

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Regardless of the type of OP treatment, you MUST remind your patients to take calcium and Vitamin D.

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Let's talk Calcium!



- Goal is 1200 mg daily
- Getting your calcium from food is best
- Better absorption
- No side effects

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Calcium: who drinks milk anymore?



- Encourage calcium supplementation if poor dietary intake
- Side effects include constipation
- The pills are HUGE!

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Vitamin D-Historical Perspective

- Unique “nutrient” in that it does not need to be eaten - not a normal part of human diet
- Vitamin D deficiency is a result of migration to higher latitudes and urbanization.
- Public health problem from late 1600's
 - Rickets in children
- 1820's: sunlight helped cure rickets
- 1919: cod liver oil was an anti-rachitic

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Vitamin D - Historical Perspective

- 1930's: fortified milk, Bond Bread, Twang soda, hot dogs, Schlitz beer...
- 1950's: cases of vitamin D toxicity with hypercalcemia in English school children → ban of vit D fortification in Europe
- Only milk and cereal fortified in the US



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OTC Treatments: Vitamin D



- Recommendations are for 800-2000 IU daily
- Check the level annually to guide dosing/compliance

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Finally: Falls lead to most fractures!


- One third of seniors fall every year
- Half are “frequent fallers”
- Risk of falls increases each decade



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Evaluation of a fall.

- Check blood pressure
 - Lying, standing, standing at 2-3”
- Medication review—see next slide
- Vision, hearing
- Check feet
- Check gait
- Osteoporosis Evaluation



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Medications



- If you are on more than 4 medications, do a **brown bag test**
- Don't forget the over the counter medications, the vitamins, the herbals, the supplements
- The EMR med list is always wrong....

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Worst best idea ever



- Hip protectors
 - They work, but...

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A Better Idea: Exercise!



- Better heart and lung function
- Muscle strength
- Fewer falls
- Better sleep
- Better mood
- And many more....

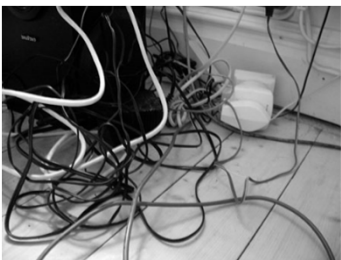
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I hate throw rugs!!!



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I hate cords, too





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Encourage your patients to consider an Emergency Response System...

How the Lifeline Service Works

- 

1 Summon help
Simply push your Lifeline Help Button at any time to connect to our 24/7 Response Centre.
- 

2 Hear a reassuring voice
A Lifeline Response Associate will access your profile and assess the situation.
- 

3 Know help is on the way
Our Associate will contact a neighbour, loved one, or emergency services based on your specific needs, and will follow up to confirm that help has arrived.

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Super Best Idea Ever!




- Make sure you stay hydrated!
- As we get older, we lose our sense of thirst
- Especially important in the morning
- Can help prevent dizziness and falls!

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Assistive Devices Prevent Falls!

- **Get 'em!!**
- **Use 'em!!**



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THANK YOU!



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