Welcome to UVM ECHO:
Osteopenia Diagnosis and Treatment

Facilitators:
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Introduction to ZOOM for ECHO

- Please mute microphone when not speaking
- Please use camera as much as possible
- Test both audio & video before joining
- Communicate clearly during session:
  - Can use “raise hand” feature to comment
  - Speak clearly
  - Use chat function for technical issues
- Didactic session will be recorded for review or if you miss a session
- RECORDING OF SESSION TO BEGIN
CME Disclosures

• University of Vermont (UVM) Office of Continuing Medical and Interprofessional Education (CMIE) is approved as a provider of Continuing Medical Education (CME) by the ACCME.

• UVM designates this educational activity for a maximum of 1.0 AMA PRA Category 1 Credits. Participants should claim only the credit commensurate with the extent of their participation in the activity.

• As an organization accredited by the ACCME to sponsor continuing medical education activities, UVMCMIE is required to disclose any real or apparent conflicts of interest (COI) that any speakers may have related to the content of their presentations.

• Interest Disclosures:
  • No disclosures
Agenda

- Objectives
- Summary from last session (2 min)
- Didactic Presentation (20 min)
- Case presentation
  - Clarifying questions
    - Participants first – then faculty panel
- Discussion of case
  - Concluding with the cohort’s recommendations
- Summary
- Closing Announcements
Objectives

- Participants will be able to:

1. Identify what defines osteopenia
2. Discuss diagnostic methods, treatment criteria, and treatment options
3. Apply information to case presentations at the end of lecture
Summary from last session

- **Insert here the top three or four learning points from the prior session, taking into account feedback from the participants, for example (from the osteoporosis into session)**

- Diagnosis is based on t-score < -2.5 or fragility fracture
  - DEXA interpretation is imperfect
  - DEXA may exclude areas of prior fracture or arthritis

- Screening per NOF guidelines
  - Women 65+, Men 70+, earlier in selected circumstances

- FRAX algorithm (WHO) estimates 10-yr fracture risk
  - Also has limitations: only hip; doesn’t account for other risks (falls, steroids, etc); not for people on Rx
  - Underestimates risk

- Trabecular bone score may help with borderline treatment decisions
Osteopenia: Diagnosis and Treatment

Amy Shah, DO, MPH
Background

- It has long been known that fractures in postmenopausal people are associated with bone fragility.
- Integration of bone mineral density (BMD) reflects the bone strength.
- BMD is determined by peak bone mass and subsequent bone loss.
• Osteoporosis: T-score of -2.5 or lower
• Osteopenia: T-score that is higher than -2.5 but less than -1.0
Medical Impact

- Meta-analysis: All show a statistically significant increased risk in future fractures (hip and other site) in patients already with a hip fracture.

Baltimore Hip Studies and the Established Populations for Epidemiologic Studies of the Elderly (EPESE) – time to non hip skeletal fracture based on hip fracture status.
WHO TO TEST?

- Women $\geq 65$ years
- Men $>70$ years
- Postmenopausal women $<65$ years of age and men $<65$ that have clinical risk factors for fracture
- Postmenopausal women and men $>50$ who have an adult age fracture, to diagnose and determine degree of osteoporosis
DXA SCAN

What to Expect During a DEXA Test

1. Lie on your back on table above x-ray generator
2. Legs are positioned on padded box
3. Images are taken of spine and hip
Vertebral fractures constitute a diagnosis of osteoporosis
Single vertebral fracture significantly increases risk of hip and other site fractures
Assess with:
  Vertebral fracture assessment or
  T-spine and L-spine xrays
Who to treat?

- Osteopenia + fragility fracture = treat
- Osteopenia + no clinical evidence of fracture = ?
Fracture risk Algorithm (FRAX)

**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/cm²)
    - Select BMD
    - Clear
    - Calculate
FRAX Score Limitations

- Several known determinants of fracture risk are not included in the FRAX score
  - Vitamin D deficiency
  - Bone turnover markers

- Algorithm does not take into account well known “dose effects” like glucocorticoid doses. Only asks for glucocorticoid use

- May underestimate fracture risk in individuals with increased propensity for falls, recent fractures, lumbar spine BMD much lower than femoral neck, secondary osteoporosis

- Can only be used in untreated patients
Lab Workup

- CBC
- 25-OH Vitamin D
- BMP
  - Calcium, creatinine
- TSH
- PTH
- Serum/urine electrophoresis
- Testosterone (men)
- Hypogonadism resulting from tx of breast cancer with aromatase inhibitors use of androgen deprivation therapy
- Bone turnover markers***
TREATMENT

- LIFESTYLE CHANGES
  - Smoking cessation
  - Alcohol cessation
  - Weight bearing exercises
  - Fall prevention
TREATMENT

- Calcium and vitamin D
  - Total intake of 1200-1500mg of calcium per day (through diet, supplement, or both)
  - 800-1000 iU of vitamin D per day

### Table 9: Estimating daily dietary calcium intake

<table>
<thead>
<tr>
<th>Product</th>
<th># of servings/day</th>
<th>Estimated calcium/serving, in mg</th>
<th>Calcium in mg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk (8 oz.)</td>
<td></td>
<td>×300</td>
<td></td>
</tr>
<tr>
<td>Yogurt (6 oz.)</td>
<td></td>
<td>×300</td>
<td></td>
</tr>
<tr>
<td>Cheese (1 oz. or 1 cubic in.)</td>
<td></td>
<td>×200</td>
<td></td>
</tr>
<tr>
<td>Fortified foods or juices</td>
<td></td>
<td>×80 to 1,000^b</td>
<td></td>
</tr>
</tbody>
</table>

Step 2: Add 250 mg for nondairy sources to subtotal above

Subtotal =

+250

Total calcium, in mg =
Pharmacologic Therapy

- Debate about baseline treatment with anti-osteoporotic in every osteopenic patients
- Antiresorptive medications: bisphosphonates, SERM, estrogen hormone therapy/combination therapy, RANK-L modulator
- Anabolic: recombinant PTH
FDA approved treatments
Randomized, blinded, placebo-controlled trial done between 1992-1997

4,432 postmenopausal women with low BMD and no vertebral fractures
FOSIT study, 1999

- 1,908 postmenopausal women with L-spine T-score of -2 or more
- Received alendronate 10mg daily or placebo once daily for 1 year
FRACTURE PREVENTION WITH ZOLEDRONATE, 2018

• Baseline characteristics
  • Mean age was 71±5 years
  • T-score at femoral neck was -1.6±0.5
  • Median 10 year risk of hip fracture was 2.3%
MORE Trial - raloxifene

- RCT of 7,705 post menopausal women with T-score <-2.5 or osteopenia with a history of vertebral fracture

- Reduce risk of vertebral fracture by 30% in patients with prior vertebral fracture and by about 55% in patients without prior fracture
Monitoring

- DXA scan every 1-2 years
- Yearly height measurement
- Calcium and vitamin D supplementation
- Treatment duration assessment
- Utility of bone turnover markers
SUMMARY

- Osteopenia is defined as low bone mass with T-score between -1 to -2.5
- DXA scan is used to diagnose osteopenia and should be ordered for every post menopausal women >65 and men >70. Earlier than this depends on risk factors
- Treatment for every osteopenic patient should always include calcium, vitamin D, lifestyle modification (smoking and alcohol cessation), and weight bearing exercises
- Pharmacologic treatment is dependent on risk fractures and FRAX Score
- FDA approved treatments include bisphosphonates and raloxifene
- Monitoring includes DXA scan every 1-2 years, risk assessment, labs, and possible bone turnover markers
References

- Harris ST, et. al. Effect of combined risedronate and hormone replacement therapies on bone mineral densities in postmenopausal women. J Clin Endocrinol Metab. 2001 May;86(5):1890-7
Case presentation

RECORDING TO BE STOPPED FOR CASE PRESENTATION
The discussion and materials included in this conference are confidential and privileged pursuant to 26VSA Section 1441-1443.

This material is intended for use in improving patient care.

It is privileged and strictly confidential and is to be used only for the evaluation and improvement of patient care.

Cases/HIPAA

- Names
- Address
- DOB
- Phone/Fax #
- Email address
- Social Security #
- Medical Record #
ECHO Reminders

- Please complete evaluation forms for each session
  • CME will be processed once session evaluation form is received at UVM

- UVM Project ECHO materials available at [www.vtahec.org](http://www.vtahec.org)

- Please contact us with any questions/suggestions
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Thank you!