

The following test-and-teach case make up an educational activity modeled on the interactive grand rounds approach. The Pre-module questionnaire is set up to test your current (i.e. baseline) knowledge. Please note that these questions are designed to challenge you; you will not be penalized for answering the questions incorrectly. At the end of the activity, please take the post-module questionnaire again, this time, after each question, you will be able to see whether you answered correctly and can then read evidence-based information that supports the most appropriate answer choice.

1. How would you rate your level of knowledge in diagnosing and managing patients with osteoporosis or at risk of osteoporotic fracture?

- Expert
- Very knowledgeable
- Knowledgeable
- Somewhat knowledgeable
- Not knowledgeable

2. How would you rate your level of confidence in identifying individuals at risk of osteoporosis or osteoporotic fracture?

- Expert
- Very confident
- Confident
- Somewhat confident
- Not confident

3. Mrs. X is a 71 years old female patient, known to have medical history of hypertension, hypercholesterolemia, and osteoarthritis, was referred to you with acute back pain and the possibility of osteoporotic vertebral fracture was raised, what assessment tool would you order to assess Mrs. X's BMD?

- Quantitative CT of the hip and spine
- Quantitative ultrasound densitometry of the hip and spine
- Peripheral dual-energy x-ray absorptiometry (DXA) of the tibia
- Dual-energy x-ray absorptiometry DXA of the hip and spine

4. Assume that prior to referring Mrs. X to you she had an X-ray of the back arranged by her GP. This showed an osteoporotic vertebral fracture. On reviewing her in your clinic, do you think DXA scan is still indicated ? If your answer is "yes" what would be the reason for ordering DXA scan at this time?

- To make a diagnosis of osteoporosis
- DXA scan is not indicated.

- To assess disease severity and have a baseline for monitoring efficacy of medication
- To obtain T-scores and employ the FRAX tool to determine whether treatment is necessary

5. Mrs. X's DXA scan revealed osteopenia at both hip and spine (T-score - 2.3 and -2.4 respectively) , whereas vertebral morphometry did not show significant loss of vertebral height. Mrs. X is currently smoking and in her visit she noted that she sustained a fracture of her left wrist 16 years ago and that her mother had hip fracture at the age of 78 years. Along with recommendations regarding life style and ensuring adequate calcium and vitamin D intake, what would be the most appropriate next step in the management of this patient?

- Recommend a bisphosphonate and repeat BMD testing in 2 years
- Recommend parathyroid hormone injections and repeat BMD testing in 2 years
- Employ the FRAX® (the WHO Fracture Risk Assessment Tool) to determine whether to initiate medical treatment
- Employ FRAX to obtain a baseline assessment and repeat BMD testing in 2 years

6. Which of the following statements about the fracture risk assessment tool (FRAX) is incorrect?

- The FRAX® tool is used to determine an individual's fracture risk based on BMD and other risk factors such as age, personal or parental history of fracture, and low body mass index.
- The FRAX® tool can help determine which patients with T-scores between -1.0 and -2.5 are most likely to benefit from pharmacotherapy for osteoporosis.
- The FRAX® tool can be used in patients receiving osteoporosis treatment to determine the effectiveness of the therapy.
- The FRAX® tool is intended for use in treatment-naïve postmenopausal women and men age 50 and older.

7. Which of the following FRAX results would be an indication for treatment to prevent osteoporotic fractures?

- 10-year probability of hip fracture $\geq 3\%$
- 10-year probability of major osteoporotic fracture $\geq 15\%$
- 10-year probability of hip fracture $\geq 2\%$
- 10-year probability of major osteoporotic fracture $\geq 10\%$

8. Medical treatment is recommended for patients with a 10-year probability of major osteoporotic fracture $\geq 20\%$ or a 10-year probability of hip fracture $\geq 3\%$.

On the basis of Mrs. X's 10-year probability of a hip fracture was (4.6%), (in addition to calcium and vitamin D supplementation) and according to NICE guidelines, which of the following osteoporosis medications would be the most appropriate choice?

- Denosumab injections
- Parathyroid hormone
- Strontium sachets
- Oral Bisphosphonate

9. Would you consider a follow up DXA scan for Mrs. X, if Yes, When ?

- Not required
- In 6 months
- In 1-2 years
- In 3-5 years

10. Which of the following bisphosphonates side effects would you discuss with Mrs. X?

- Potential for development of complete heart block
- Decreased need for calcium supplementation
- Potential for development of ONJ
- Improvement of esophageal functioning

11. Mrs. X had another similar episode of back pain after 1-year of oral bisphosphonate therapy. Plain X-ray now showed multiple vertebral fractures. Repeat DXA scan (carried out on the same machine) revealed T-score of -2.5 at the hip and -2.7 at the spine; what would be the next appropriate step in management of this patient given her new T-scores?

- Determine whether the change is greater than the most significant difference of the DXA machine used for the first test
- Obtain laboratory studies to rule out hypoparathyroidism.
- Recheck the patient's bone mineral density on a second DXA machine to confirm
- Inquire about medication adherence

12. How do we assess the efficacy a current osteoporosis therapy? Tick all what you feel correct:

- Improve bone strength: Prevention of further low trauma fracture.
- Prevent further bone loss.
- Improve BMD
- Formation of bone of normal quality
- Does not get incorporated in the bone matrix after long term use.
- Works well on cortical and trabecular bone.
- Does not inhibit collagen breakdown

- 13. Mrs. X falls risk score was high, she noted also that her muscles got weaker than before which made her gait speed got slower, she put that down to her Osteoarthritis hip and knee joints, what will you do?**
- Arrange for a blood check for CK enzyme level.
 - Measure serum Magnesium level.
 - Measure serum vitamin D
 - Arrange for X-ray Pelvis and knee joints
- 14. True or false: In a patient with osteoporosis, the initial laboratory workup may include complete blood cell count, serum calcium, 25 (OH) vitamin D, EGFR and 24-hour urine for calcium.**
- True
 - False
- 15. True or false: Frequent dosing and fear of adverse events are major reasons for patient non-adherence with osteoporosis medications.**
- True
 - False