Osteoporosis and Osteopenia Prevention: PBL

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Robin Cornell Creamer, DO, FAAFP

Assistant Director, Florida Hospital Family Medicine Residency, Winter Park; Assistant Director, Geriatric Medicine Fellowship Program, Florida Hospital, Orlando; Associate Professor, Florida State University College of Medicine, Tallahassee; Assistant Professor, University of Central Florida College of Medicine, Orlando.

Dr. Creamer is a graduate of the Chicago College of Osteopathic Medicine, Downers Grove, Illinois, and completed her family medicine residency at Florida Hospital in Orlando. She also recently completed a fellowship in geriatric medicine at Winter Park Memorial Hospital, Florida. Dr. Creamer has been practicing and teaching family medicine for more than 20 years. Following her passion for osteoporosis prevention, she leads a National Osteoporosis Foundation (NOF) support group called Central Florida Healthy Bones and has earned her NOF fracture liaison service certificate. She believes one of family medicine's critical challenges is to motivate patients to be as physically active as possible.

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Nathan Falk, MD, FAAFP

Assistant Director, Sports and Family Medicine Faculty, Florida Hospital Family Medicine Residency, Winter Park, Florida.

Dr. Falk is a graduate of the University of Nebraska College of Medicine. He completed his family medicine residency at Offutt Air Force Base (AFB). He served as residency faculty and director of sports medicine at Offutt AFB/University of Nebraska where he was the 2012 Faculty of the Year. Dr. Falk specializes in advanced non-surgical care for musculoskeletal conditions, including evaluation, ultrasound, and injections, as well as medical care of the athlete, ranging from asthma to concussions. Additionally, he has interest in faculty development and teaching residents to teach. He has published numerous chapters, books, and articles on sports and family medicine topics, as well as serving as an expert lecturer from Florida to China.

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Justin Talbott, PT, ATC, LAT

Physical Therapist, Florida Hospital Sports Medicine and Rehabilitation, Altamonte Springs, Florida.

Talbott is a graduate of the University of Central Florida in Orlando. He is a physical therapist and has spent just under 10 years managing Florida Hospital Sports Medicine and Rehabilitation clinics in Altamonte Springs and Winter Park. He is responsible for managing clinic operations, which includes center and therapist productivity, operating budget, employee and patient satisfaction, as well as campus and system initiatives. Talbott is a certified and licensed athletic trainer. He has presented on a topics related to lumbar, thoracic, and cervical spine; posture; osteoporosis; and other orthopedic conditions.

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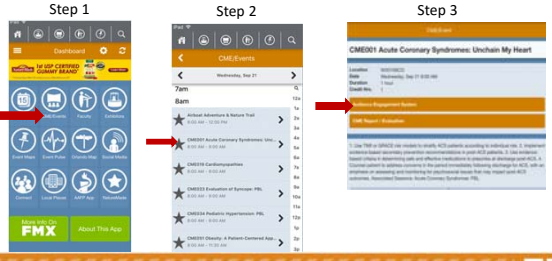
Learning Objectives

1. Practice applying new knowledge and competencies gained from osteoporosis and osteopenia prevention sessions, and receive feedback from expert faculty.
2. Interact collaboratively with peers to solve complex and challenging case-study scenarios.
3. Develop problem-solving skills that promote effective reasoning to manage osteoporosis and osteopenia prevention within the context of professional practice.

Audience Engagement System

Step 1 Step 2 Step 3



Problem Based Learning Outline

- Review osteoporosis educational resources for prevention and treatment of osteoporosis
- Apply the WHO FRAX fracture risk tool for screening and treatment
- Review evaluation for secondary causes
- Practice posture and exercise recommendations
- Discuss barriers to prescribing osteoporosis medications

Educational Resources

- National Osteoporosis Foundation(NOF) Professional Learning Center- Bone Source https://www.cme.nof.org/Resources.aspx
  - NOF Clinicians Guidelines www.nof.org or APP
  - FRAX: http://www.shef.ac.uk/FRAX
  - National Institute of Health (NIH); http://www.niams.nih.gov
  - Mayo Clinic Shared Decision Making National Resource Center https://osteoporosisdecisionaid.mayoclinic.org/
  - University New Mexico.Telementoring Bone Health TeleECHO Clinic. http://www.ofnm.org/project-echo
- AAFP http://familydoctor.org

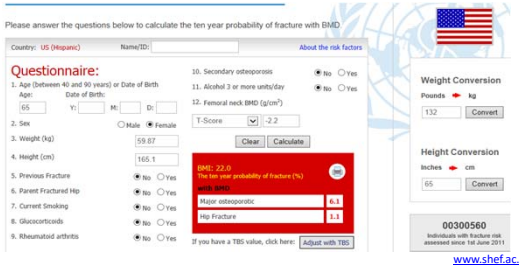
Case #1

- 65 yo Hispanic female presents for well visit. She is very health conscious, only medical concerns:
  - Mild depression(SSRI) and GERD (PPI).
- Exercises daily: pilates or spinning
- No tobacco exposure; 1 glass wine/ week
- Dietary calcium adequate (yogurt, kale, almond milk)
- Neither parent had a hip fracture
- Vitals: stable; 132 #; 5'5"(no height loss) BMI 22

Case #1-Screening DXA results

- T score Lumbar Spine(LS) -2.1
- T score Femoral Neck(FN) -2.2
- T score Total Hip(TH) -1.9

FRAX (10-year Fracture Risk Assessment tool)



www.shef.ac.uk/FRAX

Used with Permission from International Osteoporosis Foundation

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Consider Pharmacologic Therapy

Postmenopausal women and men ≥ 50 yrs
with a Hip or Vertebral fragility fracture

OR

T-score ≤ - 2.5 Femoral neck, total hip, or spine

OR

T-score between -1.0 and -2.5
and FRAX scores: Major **≥ 20%** or Hip **3%**
10-year fracture risk

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Case #1

- T score Femoral Neck (FN) -2.2
- FRAX risk with BMD, Major 6.1 %; Hip 1.1 %
- Pharmacologic treatment not indicated.
- Patient is concerned about why her bones are so thin.
  - Started supplements despite adequate dietary calcium:
    - Calcium carbonate 1200 mg/ Vitamin D 2,000 IU/day
  - Stopped spinning and pilates for fear of fracture

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AES Question #1a :
Evaluate for Risk Factors and Secondary Causes

- Recommendations to reduce her risk factors
- After considering secondary causes, what labs do you order?

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AES Question #1b: Barrier to Care-
Time to Provide Patient Education

- Share ideas and resources to provide patient education
  - Online resources
  - CPT code 99490 Chronic Care Management
  - Start an NOF Support Group / Lecture Series

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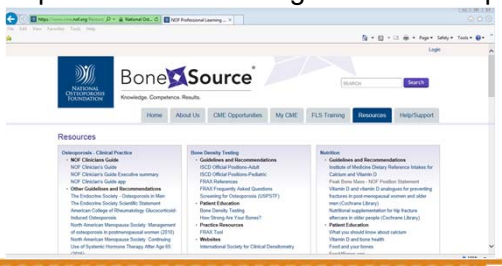
NOF Professional Learning Center
https://www.cme.nof.org/Resources.aspx



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Too Fit To Fracture Recommendations

For preventing bone loss and falls, recommend a combination of:

- Strength training for major muscle groups ≥ 2x/week
- Balance challenges daily
- Moderate-to-vigorous aerobic physical activity ≥ 150 min/week, or 20-30min per day

To reduce spine loads, recommend:

- Exercises for back extensor muscles daily
- Spine sparing strategies – hip hinge for bending, step-to-turn instead of twisting, holding loads close to body

Giangregorio LM, et al Osteoporos Int. 2014

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Practice:
Exercises for Spine Safety and Bone Health

- Posture
- Impact
- Muscle strengthening

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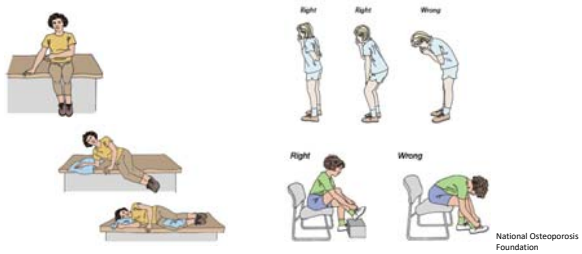
Safe Movement for Spinal Protection



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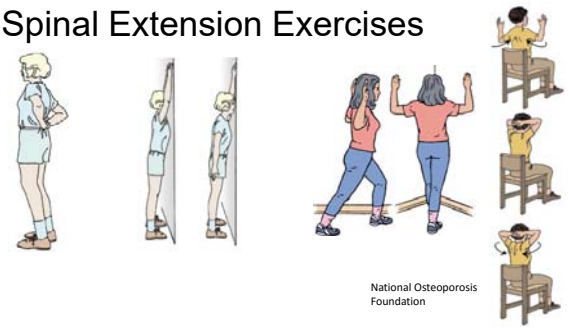
Spinal Extension Exercises



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Case #2

- 67 yo white female, treated in the ED last week for a fall. She tripped over her dog.
- Her arm is in a cast due to a distal radius Colles' fracture
- She would like to have sutures removed from the laceration on her hand.

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Case #2

- Only medical concern is allergic rhinitis(Flonase)
- Lactose intolerant with very little dietary calcium
- Describes herself as "not an exerciser"
- Has never smoked; alcohol < 3 drinks per day.
- Mother had a hip fracture
- Vitals: stable; 152 #; 5'3"(max Ht 5'4") BMI 26.9
- Laceration healing well; cast intact
- Fall evaluation including gait and balance is normal

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Case #2 - DXA Results

- Lumbar Spine (LS) -2.5
- Femoral Neck (FN) -1.9
- Total Hip (TH) -2.1

- Diagnose osteoporosis by spine BMD and consider treatment
- Calculate FRAX for further data

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Case #2 Personal and Parent Fractures

www.shef.ac.uk/FRAX

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Case #2 Pharmacotherapy Advised

- T score LS -2.5; FN -1.9; TH -2.1
- FRAX Major 29%; Hip 3.8%
- Labs:
  - CMP(CrCl 45), CBC,TSH normal
  - 25(OH)D deficient 18, pt eager to take replenishment
- No contraindications to bisphosphonates
- You recommend an oral bisphosphonate.
  - Alendronate or risedronate
  - generic, evidence to reduce all fractures

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AES Question #2: Barriers to Care:

Patient Concerns and Compliance with Medications

Patient states she doesn't want to take any medication for her osteoporosis as she heard they might cause her jaw to rot and her bones to break. You could say okay and move on to your full morning of patients or…..

How do you discuss risks of medications?

What Shared Decision Aid Tools do you use?

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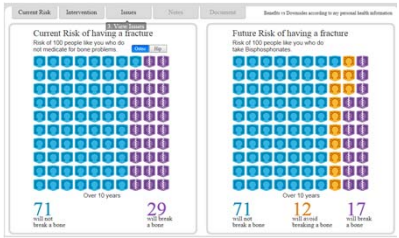
Mayo Shared Decision Aid
https://osteoporosisdecisionaid.mayoclinic.org



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Mayo Shared Decision Aid
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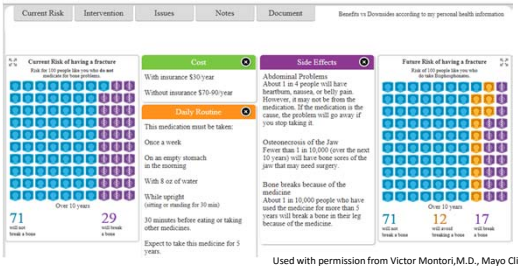

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Case #3: Drug Holiday

78 yo white female with COPD prior smoker, was diagnosed with osteoporosis 5 yrs ago with the following:

- Height 62.5" (lifetime loss 2.5"). Wt 110 pounds.
- Vertebral Compression Fracture (VCF) T10
- DXA T-scores: LS -3.5; FN -3.2; TH -3.1; FRAX major 28% / Hip 11%

Currently after 5 yrs treatment with alendronate:

- She has been compliant with medication, no side effects or thigh pain. Labs CMP, CBC, TSH normal, CrCl 38.
- Interval height loss 0.5". Ht. 5'2", Wt. 110 pounds
- Vertebral Fracture Assessment (VFA): VCFs T10, T11
- DXA T-scores: LS -3.1; FN -2.8;TH -2.7; FRAX major 26% / Hip 9.9%

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AES Question #3: Barrier to Care: Unanswered Questions- Long Term Use of Anti-resorptives and Sequential Use of Medications

Discuss options at this point?

- Continue bisphosphonate (BP)
- Drug holiday off BP
- Switch to denosumab
- Switch to teriparatide

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Which Patients Benefit > 5 years of Alendronate Treatment?

- FLEX alendronate extended 5 →10 yrs. Continued prevention of spine fractures, but no effect on non-spine fracture risk.
- Hip BMD and vertebral imaging are predictive of future fractures.
- Bone turnover markers--not predictive
- Patients who may benefit from continued therapy:
  - Older with low hip BMD and/or vertebral fractures
  - Spinal fracture and femoral neck T score < -2.0
  - Femoral Neck T score ≤ -2.5

Black DM, et al .
NEJM 2012 2012; 366:2051-2053

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Long-Term Bisphosphonate Treatment: Report of a Task Force of the American Society for Bone and Mineral Research

- After 5 yr of oral bisphosphonates(BP) or 3 yr of intravenous BP, reassessment of risk should be considered.
- In women at high risk(eg,older women, low hip T-score or high FRAX, those with previous major osteoporotic fracture,or those who fracture on therapy), continuation of treatment for up to 10 yr (oral) or 6 yr (IV), with periodic evaluation, should be considered.
- The risk of atypical femoral fracture, but not ONJ, clearly increases with BP therapy duration, but such rare events are outweighed by vertebral fracture risk reduction in high-risk patients.
- For women not at high fracture risk after 3-5 yr of BP treatment, a drug holiday of 2-3 yr can be considered.

Adler RA, et al. Managing Osteoporosis in Patients on Long-Term Bisphosphonate Treatment:
Report of a Task Force of the American Society for Bone and Mineral Research. J Bone Miner Res. 2016 Jan;31(1):16-35

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Case #3 Long Term use of Medications

- No uniform recommendation regarding duration, decisions need to be individualized
- Re-evaluate annually. DXA in 2 years. Consider bone turnover markers, CTX, NTX
- Consider restarting anti-resorptive or anabolic agent if risk increasing in 1-2 years
- Denosumab is a stronger anti-resorptive than BP
- Teriparatide- maintain bone growth at end of treatment with alternative agent

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Key Points

- Access osteoporosis educational resources for prevention and treatment of osteoporosis.
- Apply the WHO FRAX fracture risk tool for screening and treatment
- Evaluate for risk factors and secondary causes
- Provide posture and exercise recommendations
- Use Shared Decision Aids Tools
- Long Term Medication decisions are individualized.

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Questions?

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Associated Session

- Osteoporosis and Osteopenia Prevention: It's Primary

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