



# Fit to a T™

## Presentation Guide

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*Revised April 29, 2020*

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## Introduction

This presentation of *Fit to a T*<sup>™</sup> is designed for use at sessions organized with the United States Bone and Joint Initiative, NFP (USBJI). It may not be copied or reproduced without written permission from the USBJI.

The *Fit to a T*<sup>™</sup> presentation and program materials are not to be used to provide medical information, and the USBJI does not accept any responsibility for the content of the presentation or program materials, nor is it recommending or endorsing any course of treatment discussed during the session at which this presentation is made or contained in program materials. The opinions and views of the presenter are entirely their own.

The session audience should be advised to always seek the advice of their healthcare provider before initiating changes in lifestyle, diet, or exercise or for a professional opinion relating to their bone health.

The presentation consists of 16 slides, plus 2 introductory and 3 closing slides. The Presentation Guide is organized in two parts. Pages 6-42 provide an overview of what should be covered under each slide. For those seeking more detail, pages 44-53 provide additional information and references for each slide.

The program is structured around six modules presented with slides, supplemented by handouts.

1. **Module 1:** Introduction and background on bone health
2. **Module 2:** People at high risk of fracture/who have already suffered a fracture
3. **Module 3:** Fall prevention
4. **Module 4:** Screening, prevention, treatment
5. **Module 5:** Red flags (including for pre- and post-menopausal younger women and for men)
6. **Module 6:** Race and ethnic differences
7. Take-home Messages
8. Credits

Module 1 is preceded by a brief **welcome** slide, with an optional video.

These materials are designed to promote **interaction** between you (the presenter) and your audience, maximizing their engagement and thus their retention of take-home messages. To help you accomplish these goals, each module includes:



- **learning objectives;**
- **slides** with headings to help you prompt discussion and interaction with the audience, with:
  - **learning objectives** for each slide;
  - **key points** to emphasize (with the key logo shown here to identify them more easily),
  - **discussion questions** to help you transition to the next slide, reinforce key points, and check for knowledge;
  - **links to additional information** and **references** on subject matter under each slide heading;
  - **citations** that refer to a specific piece of information.

An **Evaluation Metrics Sheet** with suggested answers to key questions will be provided to you. Please e-mail a summary of answers (tracked on a flip chart page) to [usbji@usbji.org](mailto:usbji@usbji.org) so that the USBJI can maintain accurate metrics about *Fit to a T*<sup>™</sup> and its delivery.

**Please note:** In these notes, we use the term “healthcare provider” to apply to any healthcare provider, but “primary care provider (PCP)” or “doctor” to describe specific interactions with those members of a healthcare team.



## Slide 1: Welcome

Welcome participants to *Fit to a T*.™



## Slide 2: Video (optional)

Options include:

- Showing one of the videos from [www.Fit2T.org](http://www.Fit2T.org) (or having them running as the audience arrives and settles in).
- Verbally presenting the storylines (e.g., if a projector, audio, or screen is not available). See below for talking points.
- Skipping this step altogether and launching directly into PowerPoint, after welcoming participants.

## Sylvia's Story — What You Need to Know About Your Bone Health and Osteoporosis

OPTION 1 - Present video ([www.fit2t.org](http://www.fit2t.org)) which tells a story encapsulating the key educational messages of the program about preventing fractures-background to what will be discussed during session.

OPTION 2 - Storyline you can verbally present if unable to show video.

- Sylvia slips on a rug in her kitchen and breaks her wrist. She had planned to go rowing with friends but now cannot.
- Now her health care professionals tell her she has osteoporosis, a disease of weakened bones.
- Even though she is just 50 years old, she is at risk for more fractures. Sylvia never considered her bone health, thinking osteoporosis only affects the elderly. How did this happen? Could it have been avoided?
- Called the “silent disease,” you may not know you have osteoporosis until you break a bone. As a healthy and active Latina woman in her early 50s, Sylvia assumed she wouldn't be affected, but there are more risk factors than she realized.
- It's never too early to start strengthening your bones. Bone loss leading to breaks happens over a lifetime. Your bone gets stronger during childhood and adolescence, reaching its peak by your early 20s. As you age, your bones become weaker. There are ways to reverse this and strengthen your bones at any age.

- Many people don't reach and keep peak bone mass because of foods they avoid, lack of exercise, other health conditions, or medications.
- As a teenager, Sylvia worried about her weight and often drank coffee instead of milk. She preferred French fries over broccoli. Sylvia didn't realize what she ate had such an impact, but a few changes to Sylvia's diet could have made her bones stronger. Calcium is key to building strong bones and vitamin D helps our bodies absorb calcium. Sylvia and her husband now plan family meals carefully. Her osteoporosis indicates their children have a higher risk of developing the disease.
- Building a career and caring for a family is exhausting. Most evenings after the kids were in bed Sylvia collapsed in front of the TV—often consuming three to four alcoholic drinks in an evening. If she could go back, she'd limit her drinking to one glass and go for a walk instead of zoning out on the couch.
- Bones become stronger when used. Sylvia wasn't interested in sports, but weight-bearing exercise, like walking, helps keep bones healthy and strong.
- Smoking and excessive alcohol consumption can damage bone cells, increasing the risk of weakened bones.
- Sylvia's dad, Mario, fell and broke his hip last year, and Sylvia worries he'll never be able to get back to all the activities he enjoyed. Mario blamed his broken hip on the icy front step. Sylvia realizes weak bones were really the underlying culprit.
- Once his hip healed, Mario stopped taking his medication—but just because his fracture healed doesn't mean his bones are in better condition.
- Sylvia urges Mario to talk to his doctor about restarting his medication and learning a few simple exercises to improve his balance and lower his risk of another fall.
- It took a broken bone from a simple fall to teach Sylvia the importance of thinking about bone health. Making a few simple lifestyle changes might have spared her the expense, pain, days off work, and limitations she's experiencing now. Not to mention, those same lifestyle changes would also improve her health in other areas
- But Sylvia's story isn't over. Her physician obtained a test to assess her bone density and determined her risk of more fractures. She's working with her healthcare professionals to reduce her risk through medication, diet, fall prevention, and regular exercise.
- What is your risk for breaking a bone? What steps can you take to make your bones stronger? This program is designed to help you learn about assessing and reducing your risk of weakened bones leading to a break, as well as the latest advances in knowledge about this disease.

# 1

## MODULE 1: WHAT IS OSTEOPOROSIS? TYPES AND SYMPTOMS

### Learning Objectives

#### Module 1 Overall Learning Objectives

At the end of this **module**, participants will be able to:

- Recognize osteoporotic bone
- Understand the lifecycle of bone (i.e., bone is a living organism that breaks down continually and regrows, but not at the same rate throughout life or under certain health circumstances)
- Explain which bones fracture most easily
- Explain that pain is not necessarily a precursor to a break

## Slide 3 – Low Bone Mass = Poor Bone Quality



### Slide 3 Specific Learning Objectives

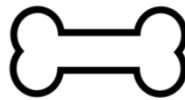
After viewing and discussing **this slide**, participants will be able to:

- Recognize osteoporotic bone.
- Understand what osteopenia is.
- Understand the difference between osteoarthritis and osteoporosis.

### Key Points



- Ask participants to draw a bone shape on a piece of paper. For most, it will look something like this:



- **Normal bone** appears as a dense network of thick trabeculae (or “beams” or struts made out of tissue) with small open spaces. It would look close to solid, like our sketches of a bone.
- **Osteoporosis**, or porous bone, is a disease characterized by less bone tissue. Osteoporotic bone, like the “very weak” bone on the right on this slide, shows clear loss of bone, with larger spaces and with perforation of the struts. These perforations lead to weakened bone, and increase susceptibility to fractures, especially of the spine, hip, and wrist. This bone loss and architectural damage results from a variety of risk factors (discussed in more detail in Slide 6. While the effects of osteoporosis are serious, there are things you can do now to prevent and treat it.
- **Low bone mass**, which is sometimes referred to as **osteopenia**, refers to a bone that is weaker than normal (between normal and osteoporotic). If you have low bone mass, your bone is not as weak as someone with osteoporosis; however, you are still at risk of breaking a bone with minor or more significant trauma. People with low bone mass may progress to osteoporosis, if no lifestyle changes or treatment are started to help make their bones healthier. Low bone mass is not a disease (just like prehypertension is not a disease) – but it is a warning sign.
- Which “**osteo**” is which? Sometimes, people confuse two terms that sound similar because they both start with “osteo” (from the Greek prefix meaning bone). **Osteoarthritis** is the most common form of arthritis; its main symptom is damage to joints (like joints in the hands, knees, and hips) when protective cartilage that cushions the ends of the bones wears down. **Osteoporosis** is the term for porous bone—a disease characterized by less bone tissue, like the bones on the slide.

## Questions for the Audience

Question	Answer
Which bone on the slide is the one showing osteoporosis?	The one on the right—because it is more porous (i.e., large spaces in the bone).
If you have low bone mass or osteopenia, should you still be concerned?	Yes. Even though osteopenia is not a disease, it could progress to osteoporosis (just like prediabetes can lead to diabetes if it is not addressed, or prehypertension to hypertension and greater risk of heart disease).
What's the difference between osteo <b>arthritis</b> and osteo <b>porosis</b> ?	Osteoarthritis is degradation of joints; osteoporosis is a disease characterized by porous bone.

## Additional Information and References



## Slide 4 – Let's Discuss the Life of Your Bones



### Slide 4 Specific Learning Objectives

After viewing and discussing **this slide**, participants will be able to:

- Explain how bones are living organisms and what this means for bone health (i.e., you lose and gain bone all the time, but not at the same rate throughout life or under certain health circumstances).
- Use the analogy of bones being like a savings account in a bank to promote healthier practices.

### Key Points



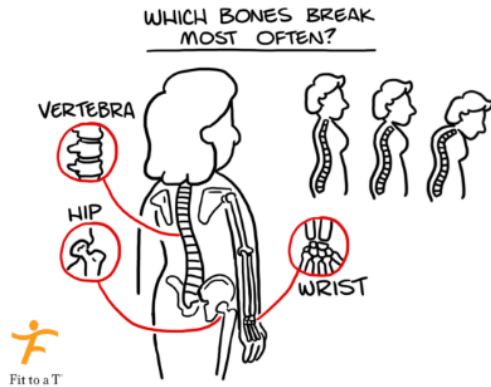
- Bone mass is built up during the early years of life. The slide shows how **peak bone mass** is reached by 30 years of age, with 90 percent of the development completed by 18 years of age.
- After that point, it is lost and gained over a lifetime in a natural process called **bone turnover**. Even though we are losing and gaining bone mass throughout our lifetime, the **rate** of bone mass gain or loss is affected by a variety of factors, including genetics, sex, medical conditions, and behaviors like diet and exercise.
- For most women, bone mass **remains stable until menopause**, when the loss of estrogen in conjunction with aging is associated with a decline in **bone mineral density (BMD)**.
- **Family history, gender and race** are responsible for the majority of peak bone mass; however, **diet and exercise behaviors** are responsible for up to 25%.
- **Frail bones may run in families**, just like other genetic legacies. That's why mothers need to talk to their daughters and granddaughters, daughters to their sisters, mothers and aunts. Young athletes, especially the female athlete triad, can be at risk.
  - The **female athlete triad** is the combination of disordered eating (e.g., crash diets and binge eating) and excessive exercise, menstrual dysfunction, and premature osteoporosis (low bone density for a young woman's age).
- It may be helpful to think of a bone's lifecycle like a **savings account** at a bank, with deposits and withdrawals contributing to an overall balance. Just like a savings account, healthier behaviors can build up the calcium in your bones, just like "deposits" build up a savings account balance. Other behaviors can deplete your reserves, just like "withdrawals" deplete a savings account balance.

## Questions for the Audience

Question	Answer
At what age are bones their strongest for most people?	In your 20s.
When does bone mass typically begin to decline for women?	Usually during menopause, because of the loss of estrogen in conjunction with aging.
What does the acronym BMD stand for?	Bone Mineral Density – a measure of bone strength.
What are some factors that affect bone strength over time?	Sex Age Medical conditions Female athlete triad (disordered eating/exercise, premature osteoporosis)
How is a bone's lifecycle like a savings account?	Bone turnover and the rate of bone mass gain or loss – the “balance” in the account—can be affected by our deposits and withdrawals (some health habits, such as diet and exercise).

## Additional Information and References

## Slide 5 – Which Bones Break Most Often?



### Slide 5 Specific Learning Objectives

After viewing and discussing **this slide**, participants will be able to:

- Identify which bones fracture most easily.
- Explain that pain is not necessarily a precursor to a break (which is why osteoporosis is a “silent disease”).

### Key Points



- Osteoporosis fractures occur most often in the **hip, wrist** and **spine**.
- While spine fractures do heal, the bones do not go back to their original shape. Vertebrae (spine) fractures can cause loss of height. Over time, multiple fractures of the spine can result in stooped posture, a loss of height, breathing and digestive problems, and continual pain.
- More than 2 million low impact fractures occur in the United States annually, approximately broken down as follows:
  - Vertebral fractures: 27-34%
  - Wrist fractures: 12-20%
  - Hip fractures: 15%
  - Pelvic fractures: 7%
  - Other fractures: 33% (Ribs, Shoulder, other)
- Unlike most serious conditions, osteoporosis doesn’t hurt or cause other symptoms until you break a bone. That’s why it is sometimes called a “silent disease.”

### Questions for the Audience

Question	Answer
Which bones most commonly fracture due to low bone mass?	Spine, wrist, hip
Why is osteoporosis called a “silent disease?”	Because unlike most serious conditions, osteoporosis often doesn’t hurt or cause symptoms (until a bone breaks)

### Additional Information and References

## Slide 6 – Risk Factors for Osteoporosis



### Slide 6 Specific Learning Objectives

After viewing and discussing **this slide**, participants will be able to:

- Identify the main risk factors for osteoporosis.
- Distinguish between those that can be changed, and those that cannot.
- Explain that people of all ages should be concerned with their bone health and the prevention of osteoporotic fractures.

### Key Points



- There are a significant number of **risk factors** to consider for osteoporosis.
- Some can be changed, and some can't. However, it is important to be aware that **you can have no risk factors and still have osteoporosis**.
- Known risk factors include some of the ones shown on the slide:
  - **Calcium & vitamin D<sup>3</sup>**: If you are indoors and don't get much sunlight (not the sunshine outside the window) or don't get enough **calcium** in your diet, you may not be getting enough **calcium** or **Vitamin D<sup>3</sup>** – both important for bone health
  - **Co-morbid conditions and past medical history**: If you have been diagnosed **breast cancer** and treated, you may also be at increased risk (because estrogen has a protective effect on bone, so reduced levels of estrogen can trigger bone loss)
  - **Lifestyle factors** such as a sedentary lifestyle, smoking, and excessive alcohol use are also risk factors
  - **Age, sex** (being female), **body size** (including low body weight), and a **family history** are all risk factors
  - **Race and ethnicity** (discussed in more detail later) is a risk factor; Caucasian and Asian-American women have the highest risk of osteoporosis (possibly due to family history / genetics)

### Questions for the Audience

Question	Answer
What are some risk factors that you have some control over?	Weight, diet (especially calcium intake), physical activity, smoking, alcohol use, Vitamin D <sup>3</sup> (from being outside in the sun)
Which risk factors cannot be changed?	Age, sex, ethnicity, family history
Is it possible to have osteoporosis, even without any risk factors?	Yes!

### Additional Information and References

# 2

## MODULE 2: PEOPLE AT HIGH RISK OF FRACTURE OR WHO

### HAVE ALREADY SUSTAINED A FRACTURE: WHAT THEY NEED TO KNOW

#### Learning Objectives

##### Module 2 Overall Learning Objectives

At the end of this **module**, participants will be able to:

- Explain that people who have sustained a fracture due to osteoporosis are at high risk of sustaining further fractures (some life-threatening)
- Explain why hip and vertebral fractures are particularly worrisome
- Understand that women age 65 and older are at heightened risk and entitled to screening
- Identify events that frequently cause osteoporotic fractures to occur
- Understand the consequences of an osteoporotic fracture
- Explain that prevention is possible and what to discuss with your healthcare provider
- Understand that evidence-based FDA-approved treatments are available, whose benefits outweigh the risks (evidence-based)

## Slide 7 – Why Did the Fracture Happen?



### Slide 7 Specific Learning Objectives

Is it possible to have osteoporosis, even without any risk factors?

- Explain that those who have already sustained a fracture are at highest risk.
- Explain why women aged 65 and older are at heightened risk and therefore entitled to screening.
- Identify events that frequently cause osteoporotic fractures to occur.

### Key Points



- A person who has sustained a fracture due to low bone mass or osteoporosis is at **high risk** of sustaining more fractures for the same reason. Healthcare professionals often call the first fracture as a sentinel event and that it is a teachable moment.
- **A patient suffering a low impact fracture should be identified quickly as being at high risk of further fractures**, so that prevention measures can be taken.
- **A low-impact fracture can be the alarm bell that warns of weak bones.** (A low-impact fracture is one that occurs after a fall or more routine event, rather than a motor vehicle crash or other high-impact trauma.)
- A patient sustaining a lesser fracture (such as wrist instead of hip or spine) is quite likely not to be identified as being at risk of further fractures by their PCP, or referred to a bone specialist for further evaluation. **Patients need to know that low-impact fractures are indicators of risk for future fractures, so they can insist on appropriate follow-up care and implement prevention measures to mitigate future risk.**
- The United States Preventive Services Task force (USPSTF) recommends that **all women age 65 and older** be tested and treated for low bone mineral density (BMD), and they are entitled to this under Medicare.
- **What event caused the fracture?** An osteoporotic fracture can occur for a number of reasons but are often a surprise to the person because of their nature. They can occur from a seemingly insignificant fall, and this is among the most common causes. These can be caused by tripping, say on a rug or items left on the floor where a person does not expect them to be, poor balance, or poor eyesight. More on this with Slide 10 on Fall Prevention.
- The next sections and slides go into more detail on prevention measures, screening, and treatment.

## Questions for the Audience

Question	Answer
Why should a low-impact fracture be a concern for patients and their healthcare providers?	Because the occurrence of a low-impact fracture is a strong indication that more fractures may occur in the future.
Should all fractures be investigated, or just the most serious ones of hip or spine?	A “lesser” fracture (e.g., of the wrist) should still be investigated thoroughly, because it could be the alarm bell that leads to preventive measures and thus avoids a more serious fracture (e.g., of the hip or spine)
What are some events that cause fractures?	Falls that may not seem significant at the time (tripping over an area rug or object, poor balance, vision problems)

## Additional Information and References

## Slide 8 – Consequences



### Slide 8 Specific Learning Objectives

After viewing and discussing **this slide**, participants will be able to:

- Identify specific consequences of different osteoporotic fractures (vertebral, hip, and wrist).

### Key Points



- Ask the group: What are some likely **consequences** of osteoporotic fractures, like the ones shown on the slide, and more? (Record on flip chart and add / prompt as appropriate ...)
  - Loss of independence
  - Pain
  - Decreased activity level
  - Difficulty with daily tasks
  - Inability to carry things, move, balance
  - Loss of self-esteem
  - Depression
  - Decreased overall quality of life
  - Possibly death
- The list we've just generated could occur with many different types of fractures. There are also some **medical consequences** that are associated with specific types of fractures that are most common. Patients with either a **hip** or clinical **vertebral** fracture, in particular, have excess mortality (i.e., risk of death) and increased risk for subsequent fractures. For example:
  - **Vertebral** fractures can lead to loss of height, loss of balance.
  - **Hip** fractures can lead to surgery (for hip replacement) and can be very serious.
  - **Wrist** fractures also can lead to surgery to repair the fracture.
- The risk of these fragility fractures increases with osteoporosis and can become a major cause for concern, leading to lack of confidence in one's ability to balance and do daily tasks, as well as psychological consequences such as fear of falling, loss of self-esteem, and depression. A major overall consequence is **loss of independence**.
- These consequences are not inevitable. With proper **nutrition and physical activity/exercise**, and possibly medication, these serious consequences can be avoided—especially if low bone mass or osteoporosis is detected early enough.



- With any condition, there can be a **relationship between physical and mental health**. In particular, deterioration in one can lead to deterioration in the other. The lack of self-esteem that happens to people when they lose height, or when a bone fractures while carrying a shopping bag or child can be devastating. These types of losses cause people to feel that the lifestyle they have led up to that point may be diminished. However, this does not have to be the case. **To avoid a loss of independence and function, people can start to work on building bone strength while they are younger and more active.** If so, the longer they will be likely to maintain height, mobility, independence, and strength.

## Questions for the Audience

Question	Answer
What are some serious consequences of hip fractures?	The most serious is death. Hip fracture survivors also often experience loss of function and independence, and sometimes lose so much function that they have to be in a nursing home or become totally dependent on others.
How do fractures affect mental health?	Fractures can lead to loss of independence and self-esteem, fear (e.g., of falling, or of never feeling better or being dependent on others), depression, and decreased overall quality of life. All of these can affect mental health.
Can physical and mental health consequences of osteoporosis be avoided?	Yes! People can work on building bone strength – the sooner, the better. Building up bone strength while young and active makes it more likely you will be able to maintain height, mobility, independence, and strength as you age.

## Additional Information and References

## Slide 9 – Fractures are Preventable: What You and Your Doctor Should Discuss



### Slide 9 Specific Learning Objectives

After viewing and discussing **this slide**, participants will be able to:

- Identify five primary approaches to prevention.
- Identify specific topics to discuss with healthcare providers.

### Key Points



- How can you prevent fractures? These five approaches are ones to discuss with your healthcare provider — especially if you've already had experienced one or more fractures.
  - A fall prevention program
  - A fracture risk assessment
  - Getting tested (and knowing when you are entitled to testing and screening)
  - Getting calcium and vitamin D<sup>3</sup>, other dietary changes, physical activity
  - Using recommended medications, if appropriate
- A healthy lifestyle and good nutrition are important but are not substitutes for pharmacological therapy or treatment. However, the treatment should be based on a diagnosis following screening and should be proven to reduce fracture risk.
- **The best treatment for osteoporosis is still prevention.** Talking to your healthcare provider is an important first step.
- If a fracture occurs, the patient's **status** should be monitored going forward. It is common for patients suffering a hip fracture and requiring surgery to be released from the hospital with no follow-up plan, nor their Primary Care Provider (PCP) informed, nor referral to a bone specialist.
- **If you are seeing a specialist, make sure they are keeping your PCP informed.** Ask about becoming registered in a **Fracture Liaison Service**, which is a process for following your care to avoid further fractures. They are not that common yet but are proven to be very effective.
- No matter what your condition, it is important to advocate for your own health, and/or for other relatives at risk. (This is sometimes called **patient advocacy**.) In the case of fracture prevention and osteoporosis, if you are at risk, so are your children and grandchildren. By advocating for your own care, you can also be an advocate for them and for their future health.
- The **Fit to a T™** booklet includes some tips to prepare for a first visit with a healthcare provider. [Handout booklet]

- Remember that it's always a good idea to take notes during this or any other appointment or ask a family member or friend to accompany you to take notes. This can help you understand and remember what was said and overcome any nervousness.

## Questions for the Audience

Question	Answer
What osteoporosis-specific topics should be discussed with a healthcare provider?	<ul style="list-style-type: none"> <li>• A fall prevention program</li> <li>• Fracture risk assessment</li> <li>• Getting tested – and knowing when you entitled to or should be getting screened</li> <li>• Calcium &amp; vitamin D, diet, physical activity, lifestyle changes</li> <li>• Medication and adhering to it</li> </ul>
What's the best treatment for osteoporosis?	Prevention
What does it mean to be a patient advocate?	It means you are advocating for your own care (or someone else's) by asking questions, being informed, keeping others informed (e.g., a PCP if you are seeing a specialist) and being prepared for conversations with your healthcare provider (e.g., bringing your own and family medical history, list of medications, and questions to an appointment).

## Additional Information and References

# 3

## MODULE 3: FALL PREVENTION

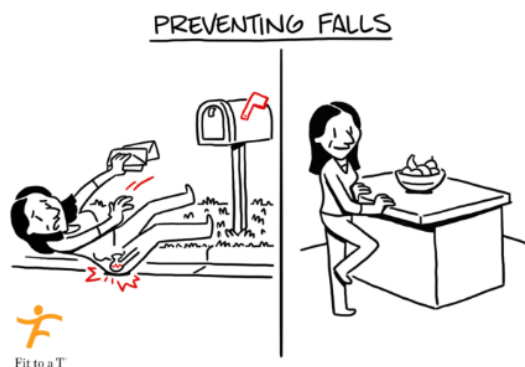
### Learning Objectives

#### Module 3 Overall Learning Objectives

At the end of this **module**, participants will be able to:

- Recognize that low impact fractures usually occur from a simple fall, and thus fall prevention is key to avoiding this happening
- Recognize that age and other factors can affect our ability to maintain our balance
- Learn some simple fall prevention strategies, and the importance of practicing them
- Discuss fall prevention with a healthcare provider, and possibly referral to a fall prevention program

## Slide 10 – Preventing Falls



### Slide 10 Specific Learning Objectives

After viewing and discussing this slide, participants will be able to:

- Identify factors associated with a greater probability of falls.
- Identify options for addressing risk factors for falls.
- Demonstrate how to practice simple balance exercises at home.

### Key Points



- **Falls are common: 1 in 4 Americans aged 65 or older falls every year.** Falls are the leading cause of fatal and nonfatal injuries for older Americans.
- **Falls are costly**—in dollars and in quality of life. Annually, 3 million older people are treated in the emergency department because of falls, with 800,000 subsequently admitted to the hospital, 300,000 of whom are admitted for hip fracture. (And we know from the previous module how serious hip fractures can be ...)
- However, **falling is not an inevitable part of aging.** Through good medical attention, practical lifestyle adjustments, evidence-based programs, and community partnerships, the number of falls among seniors can be reduced substantially.
- The National Institute on Aging (NIA) offers a **recommended evaluation for increased fall risk** (e.g., have you had one or more falls in the past 6 months?) and interventions for fall prevention, including physical therapy evaluation, Tai-Chi, walking, and resistance.
- The presence of the following **factors is associated with greater probability of falls:**<sup>6</sup>
  - Motor problems: gait or balance impairment; muscle weakness
  - Sensory impairment: peripheral neuropathy, vestibular dysfunction, vision impairment, hearing
  - Cognitive or mood impairment: dementia, depression, delirium
  - Orthostatic hypotension
  - Polypharmacy or certain medications
  - Pain, joint arthritis including the entire spine (neurological involvement, vertebrobasilar artery compromise)
  - Unrecognized cardiac arrhythmias
  - Impairment of activities of daily living (e.g. Need to use a cane or walker? Foot problems? Difficulty rising from a chair?)
  - Environmental hazards (e.g. loose rugs, poor lighting, clutter)
  - Additional factors such as age or comorbid illnesses

Presenter could demonstrate the CDC STEADI “Chair Rise Exercise” with help from a volunteer participant (link in Additional Information), and/or run through NCOA’s 6 Steps to Prevent a Fall, outlined on next page.

## NCOA's 6 Steps to Prevent a Fall (with some additional suggestions ...)

- (1) **Find a good balance and exercise program.** Look to build balance, strength, and flexibility. Contact your local Area Agency on Aging for referrals. Find a program you like and take a friend.

**Physical activity and exercise** (including strength and balance training, weight-bearing, and resistance exercises) are important for fall prevention, but many seniors respond to the *fear* of a fall by curtailing activity – *the opposite of what they need to do*. Rather, it is being *inactive* that results in loss of muscle strength and balance. In addition, the fear of falling can contribute to falling. A broken bone = broken independence.

If **balance** is an issue, get a balance assessment from a physical therapist or other health provider and consider specific individualized care or group programs such as Stepping On, or the Otago Exercise Program. (See additional information section for **balance exercises to do safely at home**.)

- (2) **Regularly review your medications with your doctor or pharmacist.** Make sure side effects aren't increasing your risk of falling. Take medications only as prescribed.
- (3) **Talk to your healthcare provider.** Ask for an assessment of your risk of falling. Share your history of recent falls. (Some elderly do not want to tell about a prior fall for fear of being institutionalized.) Your healthcare provider may evaluate sensory impairment including vision, vestibular, deep tendon reflexes, tactile and vibration and/or test balance and gait (such as getting out of a standard armchair without use of arms for support, walk a distance, sit down again – Timed Up and Go test).
- (4) **Get your vision and hearing checked annually and update your eyeglasses**  
Your eyes and ears are key to keeping you on your feet.
- (5) **Keep your home safe**  
Remove tripping hazards, increase lighting, make stairs safe, and install grab bars in key areas. (See additional information section for more home safety ideas.)
- (6) **Talk to your family members**  
Enlist their support in taking simple steps to stay safe. Falls are not just a seniors' issue.

## Questions for the Audience

Question	Answer
What are some reasons for falls?	Many factors contribute to falls, including hazards in the home (e.g., area rugs, clutter, steps with no railings, slippery surfaces), motor problems (like gait or balance impairment, or muscle weakness), sensory (e.g., vision) or cognitive impairments (e.g., dementia), certain medications or combinations of medications
How can falls be prevented?	<ul style="list-style-type: none"><li>• Participating in a balance/exercise program that builds balance, strength, and flexibility</li><li>• Talking to a healthcare provider to assess risk</li><li>• Annual vision and hearing check-ups</li><li>• Home safety improvements</li></ul>
What might a healthcare provider do during a visit about falls?	<ul style="list-style-type: none"><li>• Ask about recent fall history</li><li>• Test balance and gait (e.g., Timed Up-and-Go Test)</li><li>• Evaluate sensory impairment</li></ul>

## Additional Information and References

# 4

## MODULE 4: SCREENING, PREVENTION, & TREATMENT

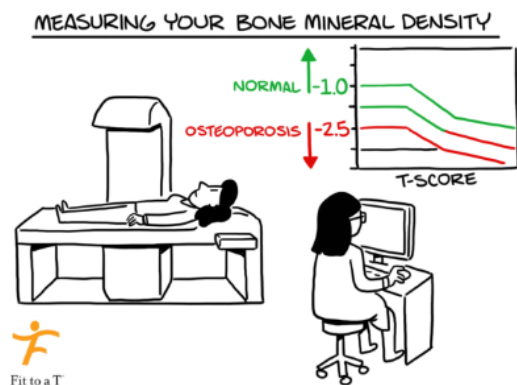
### Learning Objectives

#### Module 4 Overall Learning Objectives

At the end of this **module**, participants will be able to:

- Understand when you need to be tested for your bone density and risk of fracture
- Explain patients' rights about testing
- Explain what a T-score is, the measurement, and a FRAX score
- Identify prevention strategies in addition to fall prevention, including calcium and vitamin D needs, dietary balance, and weight-bearing exercise
- Understand the basic mechanisms underlying treatment options

## Slide 11 – Measuring Your Bone Mineral Density



### Slide 11 Specific Learning Objectives

After viewing and discussing **this slide**, participants will be able to:

- Determine when testing for bone density and risk of fracture is appropriate.
- Understand patients' rights to be tested.
- Explain T-scores and their measurement.
- Explain FRAX scores and their significance.

### Key Points



People who have any low-impact fracture should have their **bone density** analyzed (using an x-ray scan of bone density called DXA) and their **risk of further fracture** estimated (using a risk assessment algorithm tool called FRAX).

### Bone Mineral Density Testing

- **Bone mineral density (BMD)** is measured by an x-ray scan called **DXA** (which stands for dual-energy x-ray absorptiometry). (In some situations, bone mineral density also can be measured by an ultrasound of the heel or a quantitative CT (QCT) scan, but only a DXA or QCT is used to determine treatment.)
- The BMD test (using either a DXA scan or a QCT scan) is recommended for:
  - All **women aged 65 or older**. The DXA measurement of bone mineral density is covered by Medicare for women aged 65 and above.
  - All **men aged 70 or older**
  - Postmenopausal **women under age 65** (especially if they have other risk factors, such as a family history or previous fracture)
  - **Men between the ages of 50 and 70** who have risk factors
  - Any person (of any gender or age) with a **fragility fracture**.
- The **DXA test** determines bone strength by assessing how much mineral (such as calcium) is in a person's bones. It is used to estimate, along with other risk factors, the risk of a broken bone.
- The DXA test is conducted on a DXA machine. It takes about 15 minutes, requires no preparation and you can remain dressed. The test does not hurt; no needles are involved. Radioactive exposure (from the x-ray) is less than a chest x-ray or mammogram.

### The Fracture Risk Assessment Tool (FRAX)

The FRAX score estimates your 10-year risk of having an osteoporosis-related fracture. It takes into account risk factors such as age, sex, weight, height, and hip BMD (if available), as well as clinical risk factors. All of these are considered together to help your healthcare provider determine whether treatment for osteoporosis is warranted.



## **DXA Test Results**

The DXA test results compare bone density to that of a healthy young adult who would have peak bone mass. The results are expressed as a T-score (or deviation from an average). The lower the score, the lower your bone density.

Results:

Normal -1.0 or higher

Low bone density (osteopenia) Between -1 and -2.5

Osteoporosis -2.5 or lower

If the DXA yields a T-score equal to or below -2.5 (osteoporosis), medication treatment is indicated. The lower the T-score, the higher the risk of fracture.

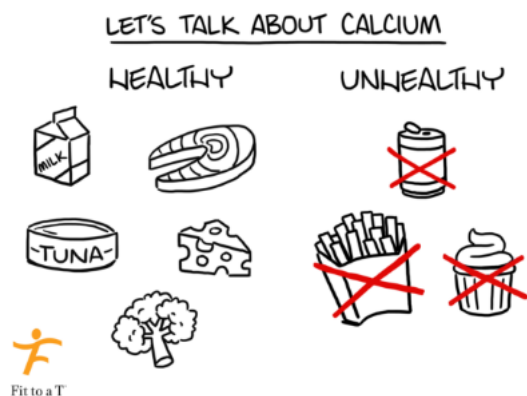
A follow-up DXA is covered by Medicare every 24 months, or more often if determined to be medically necessary for monitoring a recommended treatment.

## **Questions for the Audience**

<b>Question</b>	<b>Answer</b>
Who should receive a BMD test?	Women aged 65 or older, men aged 70 or older, postmenopausal women with risk factors and men ages 50-70 with risk factors; anyone with a previous fragility fracture.
What does the Fracture Risk Assessment Tool measure?	The 10-year risk (based on multiple factors) of having an osteoporosis-related fracture.
What are some ways that a low-impact fracture would be investigated or followed up?	X-ray scan of bone density (DXA); risk assessment algorithm to predict future fracture risk (FRAX)
What makes a treatment safe?	FDA approval, which means scientific evidence supports the conclusion that the treatment's benefits outweigh any potential risks

## **Additional Information and References**

## Slide 12 – Let's Talk About Calcium



### Slide 12 Specific Learning Objectives

After viewing and discussing **this slide**, participants will be able to:

- Describe calcium requirements to prevent bone loss and promote bone growth.
- Identify calcium per serving on a food label.
- Identify baseline dietary calcium intake to determine whether changes are warranted.

### Key Points



- Calcium and vitamin D are essential to building bones and keeping them healthy. Calcium, a mineral, also enables our blood to clot, our muscles to contract, and our heart to beat. About 99% of the calcium in our bodies is in our bones and teeth. Every day we lose some calcium, so we need to generate more, either from what we eat, or some other means. If our bodies don't have enough calcium, they take it from our bones, which is what can make our bones more fragile and susceptible to fracture.
- **A healthy diet should be a primary source of calcium**, which is needed (along with vitamin D<sup>3</sup>) to build bone at all ages. If you eat a healthy diet with calcium-rich foods, there's no need to add supplements. However, if you are not able to consume calcium through food sources (e.g., if you cannot consume dairy products), supplements are available.
- **Supplements** can be necessary and particularly important for pregnant and lactating women, or for people taking certain medications for osteoporosis. People should discuss with their healthcare provider how much they need before taking supplements, and how much will in part depend on their normal dietary intake. Supplements vary in terms of whether they need to be taken with meals (calcium carbonate) or anytime (calcium citrate). However, your body can only absorb about 300-500 mg of calcium at a time.
- **Eating disorders** such as amenorrhea, anorexia and bulimia can cause a lack of sufficient calcium and vitamin D needed to maintain optimal bone strength.
- **Calcium rich foods** include:
  - Dairy products such as yogurt, cheese, and milk (regular, low-fat, or skim). Milk fortified with calcium provides 500 mg of calcium per 8 ounces of milk.
  - Canned sardines with bones. 3 oz. of sardines contains 375 mg of calcium. Salmon and anchovies also are sources of calcium.
  - Fortified orange juice. 500 mg of calcium per 8 ounces of juice.
  - Green leafy vegetables like broccoli. A cup of fresh cooked broccoli contains 175 mg of calcium. Other dark leafy greens (turnip greens, mustard greens, collard greens) also can add a substantial amount of calcium to the diet.

- **How much calcium do you need?**

The amounts of calcium vary by age but are generally between 1,000 and 1,200 mg per day for adults aged 50 and older.

<u>Infants</u>	<u>Amount in mg/day</u>
0-6 and 6-12 Months	210 / 270

<u>Children and Adolescents</u>	
1-3 and 4-8 years	500 / 800
9 through 18 years	1300

<u>Adult Women and Men</u>	
19 through 50 years	1000
> 50 years	1200-1500

<u>Pregnant and Lactating Women</u>	
18 years	1300
19 through 50 years	1000

<u>Sample Contributions to Total:</u>	
Meals	750 mgs
Calcium Supplement	<u>500 mgs</u>
Total	1,250 mgs

- **Food labels** show calcium per serving as a percentage of 1,000 mg per day. If a label says a serving provides 20% of the daily calcium requirement, that would be 200 mg. (Similarly, 15% would be 150 mg, and so on.) Adjust serving sizes accordingly to calculate what is being consumed (e.g., 2 cups of milk instead of 1 cup).

Consider passing around a food label of a carton of milk or other item at the training event to illustrate this point.

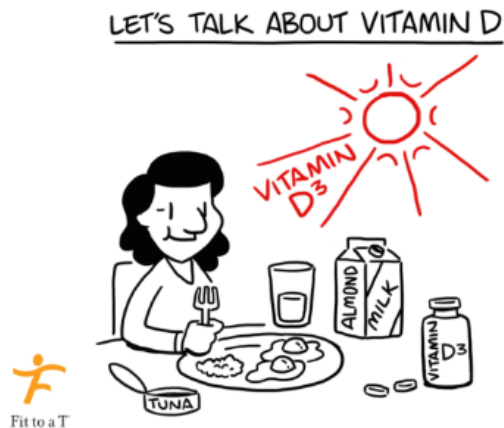
- People taking medication to reduce loss of bone and/or to grow bone usually need to take extra calcium, over and above their natural dietary intake, because a certain level (the recommended level of daily intake – see listing above) is required for the medications to work.

## Questions for the Audience

Question	Answer
If you eat a diet with enough calcium to meet the daily requirements, are supplements still needed?	No. Supplements are an option if you are not able to get enough calcium through your diet, or if you need extra calcium (e.g., pregnant or lactating women, or taking medications for osteoporosis).
What are examples of foods that are rich in calcium?	Dairy products (yogurt, cheese, and milk); canned sardines with bones; fortified
How much calcium do most people need?	It varies by age, but most adults over 50 need between 1,200 and 1,500 mg per day.

## Additional Information and References

## Slide 13 – Let's Talk About Vitamin D<sup>3</sup>



### Slide 13 Specific Learning Objectives

After viewing and discussing **this slide**, participants will be able to:

- Describe how vitamin D<sup>3</sup> is needed for the body to absorb calcium to prevent bone loss and promote bone growth.
- Identify sources of vitamin D<sup>3</sup> and recommended levels.
- Describe the safety of vitamin D<sup>3</sup> supplements.

### Key Points



- Vitamin D<sup>3</sup> is essential for **absorbing calcium** from your diet through the gastrointestinal tract, but it is more difficult than calcium to take in through food sources.
- Vitamin D<sup>3</sup> is produced by the skin when exposed to **direct sunlight** and also can be ingested through certain **foods** (such as egg yolks, fish, liver, fortified dairy products, and fortified orange juice). Just as with calcium itself, **supplements** are available for those who might be at risk of low vitamin D intake, but these should only be used after consulting a physician.
- Between 600-1,000 units of vitamin D<sup>3</sup> are recommended daily, with different recommendations from the National Osteoporosis Foundation (NOF) and Institute of Medicine (IOM). Your doctor may recommend a blood test to see how much vitamin D<sup>3</sup> is in your body.
- Vitamin D<sup>3</sup> supplemented dairy products can be a good choice. A note of caution here is important and worth repeating: **Vitamin D can be toxic, so care should be taken, and your doctor consulted before you begin to take vitamin D supplements.**
- Your age, sex and whether or not you are pregnant will determine the best dosage of calcium and vitamin D. Consult your doctor/healthcare professional.
- What about **sunscreen and vitamin D<sup>3</sup>**? Sunscreens block the body's ability to manufacture vitamin D<sup>3</sup> from ultraviolet B rays. For example, a sunscreen with an SPF of 8 blocks 95% of UVB rays, and an SPF of 30 blocks UVB rays almost one hundred percent. Clothing also blocks UVB rays. People with darker skin absorb fewer UVB rays, and older people are less able to make vitamin D<sup>3</sup>, even with sun exposure. So, **people with darker skin, older people, those who routinely use sunscreen or protective clothing when outside, those with limited time outdoors (such as many office workers or those with chronic illnesses) are all at risk of not having adequate vitamin D<sup>3</sup>.**

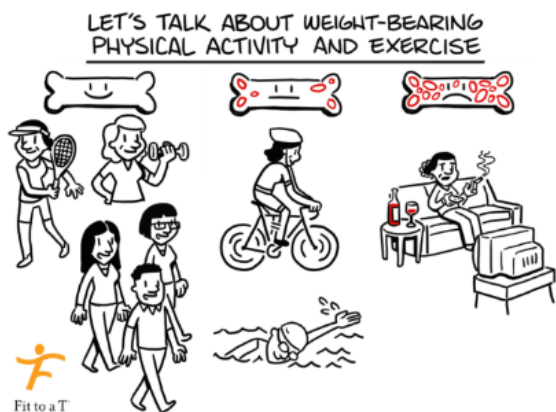
- Only about 10 minutes of sun exposure or less daily is needed to provide calcium synthesis. Patients should be **cautioned not to abandon sunscreen use** due to the obvious adverse effects.
- Vitamin D<sup>3</sup> supplementation should be advised for **patients unable to have sun exposure without sunscreen use** and is especially important for older individuals who live in northern latitudes or who are housebound. They are at greatest risk for vitamin D<sup>3</sup> deficiency.

## Questions for the Audience

Question	Answer
Why is vitamin D important?	It helps the body absorb calcium from the gastrointestinal tract. (If you are eating calcium-rich foods but not getting enough vitamin D, you may not be getting the benefit of the calcium-rich foods you are eating.)
What are sources of vitamin D?	Exposure to directly sunlight (about 10 minutes per day) Specific foods (egg yolks, fish, liver) Supplements ( <b>consult a healthcare provider first</b> )
How much vitamin D do people need?	There is some controversy over the recommended amount, but most adults over 50 should consume at least 600 to 800 IUs of vitamin D daily and up to 1,000.
Are vitamin D supplements safe?	Check with a healthcare provider before taking vitamin D supplements so you can know exactly how much you need and can be monitored. <b>Excessive vitamin D can be toxic.</b>

## Additional Information and References

## Slide 14 – Let's Talk About Weight-Bearing Physical Activity and Exercise



### Slide 14 Specific Learning Objectives

After viewing and discussing **this slide**, participants will be able to:

- Explain the importance and benefits of weight-bearing physical activity and exercise to prevent bone loss and promote bone growth
- Identify specific examples of weight-bearing physical activity and exercise
- Identify options for strengthening muscles and increasing flexibility and balance
- Identify specific ways to avoid injury

### Key Points



- **In general, physical activity and exercise are good for us.** Staying active can help us stay strong and maintain function, as well as staying connected to others.
- **Physical activity and exercise** offer a number of **benefits** for people at risk for osteoporosis, including:
  - Decreased risk of falling (discussed in detail in Slide 9)
  - Improved bone mass and strength
  - Enhanced muscle strength
  - Improved balance, better posture
  - Increased flexibility of soft tissues
  - Improved cardiovascular fitness
  - Decreased depression
- **Not all exercise or activity builds bone strength.** In general, weight-bearing exercise (walking, running, tai-chi, etc.) is good for bones. Swimming and cycling (where you don't bear your own weight) can make your muscles stronger and help with cardiovascular health and circulation but doesn't necessarily benefit bones.
- **Bones become stronger when used.** Weight-bearing exercises, such as walking, jogging, and some sports, keep bones healthy. **Weighted exercises strengthen the bone(s) next to the muscles being used**, but not all bones. However, **weighted exercises help make you stronger**, making it less likely that you will fall. **Site-specific weighted exercises may decrease your risk of breaking a bone.** Before initiating a new exercise program, such as running or heavy weightlifting, a clinician's evaluation is appropriate to determine which exercises are best for each individual.

- **Regular routine of weight-bearing exercise** can be recommended to younger and physically able patients. A routine could include walking, stair climbing, dancing, or jogging.
- A weight-bearing regimen should be supplemented with **exercise designed to strengthen muscles and increase flexibility and balance**, such as tai chi or yoga.
- General guidelines **to avoid additional injury** in patients diagnosed with osteoporosis and for those who are elderly or who have limited movement capabilities include:
  - Avoid exercises involving forward flexion of the spine or bending forward from the waist
  - Avoid exercises that twist or jerk the spine
  - Participate in exercise programs that allow one foot to remain on the floor at all times to maintain balance

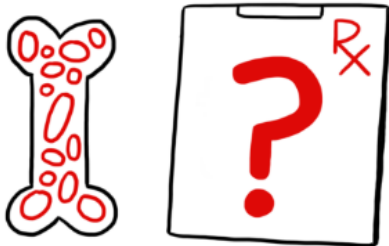
## Questions for the Audience

Question	Answer
How does lack of activity — such as a sedentary, “couch potato” lifestyle — affect your bones.	Without regular use, bones become weak. (Muscles, too!)
What types of exercise and physical activity are most beneficial for building bone strength?	Weight-bearing activities such as walking, jogging, dancing, stair-climbing, tai-chi, yoga
What types of exercise are not as beneficial to building bone strength?	Swimming, cycling – non-weight-bearing activities (but these are still good for other things, such as strength, endurance, cardiovascular health)
What are some benefits of physical activity and exercise, besides building bone strength?	Muscle strength, decreased risk of falling, improved balance and posture, increased soft tissue flexibility, cardiovascular fitness, mental health benefits, social connection/decreased isolation
How much weight-bearing physical activity do your bones and muscles need?	It really depends on your situation, but with rare exceptions, being more active is generally helpful to overall health and bone health in particular. Consult with your healthcare provider before trying anything new or strenuous and be safe — but keep active within these limits!

## Additional Information and References

## Slide 15 – How Do Medications Work to Strengthen Your Bones?

### HOW DO MEDICATIONS WORK TO STRENGTHEN YOUR BONES



### Slide 15 Specific Learning Objectives

After viewing and discussing **this slide**, participants will be able to:

- Describe the basic mechanisms underlying treatment options, including the differences between anti-resorptive and anabolic/bone-building approaches
- Affirm that all approved medications can stabilize or increase bone density, improve bone strength, and decrease fracture risk
- Understand the importance of adhering to prescribed medications because the risk of not taking them (a high risk of fracture) can outweigh possible side effects and adverse events

### Key Points



- **There is no cure for osteoporosis**, but there are medications approved to either prevent and/or treat it. The National Osteoporosis Foundation (NOF) guidelines suggest that clinicians consider treatment with an FDA-approved drug for women (and men) ages 50 and over who meet one or more of the following criteria:
  - a history of hip or spine fracture
  - a T-score of less than  $-2.5$  at the hip or spine
  - a T-score of  $-1.0$  to  $-2.5$  at the hip or spine (indicating low bone mass short of osteoporosis) together with a 10-year, FRAX-estimated risk of more than 20% for any major osteoporosis related fracture *or* more than 3% for hip fracture.

- **Please note that in this session, you must not address or give advice about any specific patient's situation.** That is best discussed by patients with their healthcare providers. Instead, talk about how medications to treat osteoporosis work.

*We recognize some people experience adverse side effects after taking medications over a period of years. Decisions about continuing medications and managing side effects are best discussed with a patient's healthcare provider because each situation is unique. In most cases, prescribed medications should be adhered to because the risk of not taking them (a high risk of fracture) can outweigh any benefit from avoiding side effects.*

- There are currently **two basic approaches** to treating loss of bone density with medications. One form of medication (**anti-resorptive**) **slows down bone loss**. The other type of medication (**anabolic**) **builds new bone**. The drugs in both types can increase bone mineral density, but only anabolic drugs build new bone.
- **Bone is a living organ**, breaking down and being regenerated all the time. The process of regeneration slows down as people age.



(Remember the analogy of a bone savings bank, with the more saved in younger years the stronger bone is likely to be as people age, but requiring ongoing deposits as they age?) **All approved medications can stabilize or increase bone density, improve bone strength, and decrease fracture risk.**

- **Bone undergoes constant remodeling**, kept in balance by osteoclasts destroying bone and osteoblasts creating bone. Bone resorption is the process by which osteoclasts break down the tissue in bones and release the minerals, resulting in a transfer of calcium from bone tissue to the blood.
  - **How do anti-resorptive medications work?** Anti-resorptive medications encourage osteoclast cells to die, thereby slowing bone loss allowing bone growth to catch up with bone loss.
- A newer class of resorptive drug is a **monoclonal antibody** — a fully human, lab-produced antibody that inactivates the body's bone-breakdown mechanism.
  - **How do bone-building/anabolic medications work?** These work by stimulating the bone-forming cells called osteoblasts.
- Fracture risks can be mitigated (in part) by **treatments that are FDA-approved**. FDA-approved treatments are based on scientific evidence and recommendations from professional societies that the benefits of the treatment outweigh the risks.

## Questions for the Audience

Question	Answer
Is there a cure for osteoporosis?	No, but approved medications are available to prevent and/or treat osteoporosis.
What are the two main approaches to treating the loss of bone density with medication?	Anti-resorptive – slows down bone loss Anabolic – builds new bone
Why is adherence to prescribed medication important?	The risk of fracture that the medications prevent outweighs, in most cases, adverse side effects – but this is a discussion patients should have with their doctor (if they are concerned about taking medication or are experiencing side effects from their medications) to manage the situation safely and effectively.
What makes a treatment safe?	FDA approval, which means scientific evidence supports the conclusion that the treatment's benefits outweigh any potential risks

## Additional Information and References

# 5

## MODULE 5: RED FLAGS

### Learning Objectives

#### Module 5 Overall Learning Objectives

At the end of this **module**, participants will be able to:

- Understand when younger postmenopausal women are at high risk of fracture, should be screened, and measures taken to prevent fractures
- Understand when men are at high risk of fracture, should be screened, and measures taken
- Understand indications that put premenopausal women and younger men at risk of fracture, who should be screened and measures taken, especially those having sustained any low-impact fracture or experiencing comorbidities
- Understand the role of race and ethnicity in risk for osteoporosis

## Slide 16 – Red Flags



### Slide 16 Specific Learning Objectives

After viewing and discussing **this slide**, participants will be able to:

- Explain the indications of risk for younger, postmenopausal women; for men; and for people with comorbidities

### Key Points



- Lifelong bone health and causes of fractures due to osteoporosis have been discussed but focused on people at highest risk being those who have *already* sustained an osteoporotic fracture and older postmenopausal women. This section covers groups that have gotten less attention so far: **younger women who have reached menopause, men, and people with comorbidities.**
- **Younger postmenopausal women:**
  - If you're over age 50, you have an even lifetime chance of breaking a bone because of osteoporosis. The risk increases with age in both sexes, but **postmenopausal women are at special risk because bone loss is accelerated by the decline in estrogen at menopause. So, every woman is at increased risk following menopause.**
  - Most experts recommend **DXA screening** for younger women who have risk factors associated with bone loss. That includes women over 50 who have a low body mass index (BMI), a history of low-trauma fracture as an adult, or a condition associated with bone loss, such as celiac disease, Crohn's disease, rheumatoid arthritis, or anorexia nervosa.
  - A woman who is taking certain **medications**, including glucocorticoids, chemotherapy drugs, immunosuppressants, or certain anticonvulsants, is also at increased risk of bone loss and may benefit from DXA testing before age 65. Women who discontinue estrogen therapy lose bone rapidly, just like those in the first few years of menopause.
  - The FRAX tool (available online at [www.shef.ac.uk/FRAX](http://www.shef.ac.uk/FRAX) and discussed with [Slide 10](#)) is designed to assess postmenopausal women's fracture risk even without BMD measurement.
- **Men:**
  - Osteoporosis and consequent fracture are not limited to postmenopausal women. There is increasing attention being paid to osteoporosis in older men. **Men suffer osteoporotic fractures about 10 years later in life than women**, but life expectancy is increasing faster in men than women. Thus, men are living long enough to fracture, and when they do the **consequences are greater than in women, with men having about twice the 1-year fatality rate after hip fracture**, compared to women.

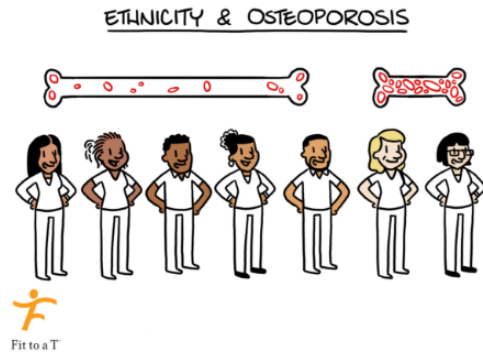
- **Men at high risk for fracture** include those men who have already had a fragility fracture, men on oral glucocorticoids or those men being treated for prostate cancer with androgen deprivation therapy. Beyond these high-risk men, there are many other risk factors and secondary causes of osteoporosis in men. Evaluation includes careful history and physical examination to reveal potential secondary causes, including many medications, a short list of laboratory tests, and bone mineral density testing by dual energy x-ray absorptiometry (DXA) of spine and hip. Recently, international organizations have advocated a single normative database for interpreting DXA testing in men and women. The consequences of this change need to be determined. There are several choices of therapy for osteoporosis in men, with most fracture reduction estimation based on studies in women.
- **Younger or premenopausal women:**
  - Osteoporosis in younger women results from either a low peak bone mass, increased bone loss prior to menopause, or both.
  - In the case of premenopausal osteoporosis, secondary causes are responsible for at least half of cases. **Secondary causes** include medications, endocrine disorders, malnutrition or malabsorption, inflammatory disease (RA, SLE), transplant patients, and some other causes. Risk factors for low BMD in premenopausal women include low body weight, amenorrhea, lack of physical activity, smoking, low dietary calcium or vitamin D, personal or family history of fracture, pregnancy and Caucasian or Asian race. Minimal bone loss is noted during pregnancy and breastfeeding; however, this loss is usually corrected shortly after pregnancy and breastfeeding are complete.
  - A study by scientists at the FDA concluded **women who reached menopause before the age of 40 had a significantly higher risk for fracture than the older women**, regardless of the treatment intervention. The effect of menopause age on fracture risk was not altered by hormone therapy or calcium supplements. Researchers concluded that early age of menopause appeared to be an independent contributor to postmenopausal fracture risk. One idea of why younger menopausal women may be at greater risk for fractures is a longer duration of decreased estrogen that they experience compared to those who reach menopause later. However, the researchers showed that there was an increased fracture risk even for those who were treated with hormone therapy.
- **People with morbidities:**
  - A number of scientific studies have concluded women and men (usually older men) with comorbidities are at increased risk of fracture. These comorbidities include breast cancer, diabetes, COPD, cerebrovascular disease, renal failure, HIV infection, and dementia. In the case of older men, these comorbidities are predictors of hip fracture, which is a predictor of untimely death. Other warning signs include back pain or spinal deformity and loss of height.

## Questions for the Audience

Question	Answer
What is the biggest red flag for osteoporosis?	Sustaining a low-impact fracture in the past.
Why are postmenopausal women at increased risk of osteoporosis?	Bone loss is accelerated by the loss of estrogen that occurs with menopause. Women who discontinue estrogen therapy also lose bone rapidly. The FRAX tool can be used to determine risk and possible treatment.
What factors place men at higher risk for osteoporosis?	Prior fragility fracture, taking oral glucocorticoids, treatment for prostate cancer with androgen deprivation therapy.
What contributes to osteoporosis in younger women?	Low peak bone mass, accelerated bone loss prior to menopause, or both. Peak bone mass variations are genetic in 60-70% of cases, but diet and exercise behaviors are responsible for up to 25%.
Are people with comorbidities at great risk of fracture?	Yes – among both men and women (usually, older men). Comorbidities include breast cancer, diabetes, COPD, CVD, renal failure, HIV infection, and dementia. These predict hip fractures in older men, which also predicts untimely death for older men.
What are some other warning signs?	Low back pain Spinal deformity Loss of height

## Additional Information and References

## Slide 17 – Ethnicity & Osteoporosis



### Slide 17 Specific Learning Objectives

After viewing and discussing **this slide**, participants will be able to:

- Understand comparative fracture risk for different ethnic and racial populations

### Key Points



- Significant risk for osteoporosis has been reported in people of all racial and ethnic backgrounds, and in both sexes. Ethnicity and race are important factors influencing the incidence of osteoporosis, which makes sense when we consider that **heredity and genetics** play a role. Furthermore, there are differences in risk factors and treatment outcomes for osteoporosis based on ethnicity and race.
- **Highest risk: Caucasian and Asian-American women** have the highest risk of osteoporosis and may be at risk of osteoporosis or low bone mass due to family history (genetics, heredity).
- **High risk: Hispanic women are at higher risk than we realized**; this may reflect increased awareness of bone health issues in this population and increased testing.
  - More than half of Hispanic women 50 years of age or older have experienced loss of bone density.
  - Hispanic women tend to consume less calcium than the RDA due to issues with lactose intolerance; in addition, Hispanic women may be less likely to participate in regular exercise. These are generalizations, however, as diet and exercise depend on acculturation and opportunity.
  - Hispanic women are at the highest risk for osteoporosis when measured using LS-Spine; more vertebral fractures.
- **At risk:** Although African-American women generally have higher bone density and are at somewhat lower risk than their Asian-American and Caucasian counterparts, this should not be taken to mean that there is no cause for concern among this population.
  - 5% of African-American women over 50 have osteoporosis.
  - 35% more have low bone density.
  - 80-95% of all fractures suffered by African-American women over 64 are related to osteoporosis.
- African-American women are more likely than Caucasian women to die from hip fractures because African-American women tend to be older or have other health conditions than Caucasian women at the time of fracture.

- As African-American women age, their risk for hip fracture doubles approximately every 7 years, bringing them to the same risk levels as Caucasian women. Studies indicate that African-American women consume 50% less calcium than the RDA and are less likely to engage in regular weight-bearing exercise. African-American women are less likely to undergo evaluation after a fracture than are women from other races.
- The incidence of osteoporosis is expected to increase as the estimated number of hip fractures worldwide is expected to rise sharply over the next ½ century.

### Questions for the Audience

Question	Answer
Which racial/ethnic groups are at highest risk?	Caucasian and Asian-American women
What about the next highest risk?	Hispanic women
Who is still at risk, even if not as high risk as other groups?	African-American women

### Additional Information and References

# 6

## MODULE 6: TAKE-HOME MESSAGES AND CLOSING SLIDES

### Learning Objectives

#### Module 6 Overall Learning Objectives

At the end of this **module**, participants will be able to:

- Recall and reinforce key points learned during the session.
- Identify a specific lifestyle change or other action step based on what was learned.



## Slide 18 – What Have You Learned, What Actions Will You Take?

WHAT ARE THE TOP 3 THINGS YOU  
HAVE LEARNED FROM THIS SESSION?

WHAT LIFESTYLE CHANGES WILL YOU  
MAKE AND/OR ACTIONS TAKE?



Fit to a T™

### Slide 18 Specific Learning Objectives

After viewing and discussing **this slide**, participants will be able to:

- Reinforce what they have learned during the session.
- Identify a specific lifestyle change or other action step based on what was learned.

**Presenter – Please...**

**The USBJI needs metrics to monitor attainment of the learning objectives.**

**As you ask these two questions, please note the responses, and email this information to [usbji@usbji.org](mailto:usbji@usbji.org).**

**We want to know the top 3 things learned, and the top 3 lifestyle changes or actions. If you can give us a longer list even better, but please prioritize the top three items for each question.**

**Thank you.**

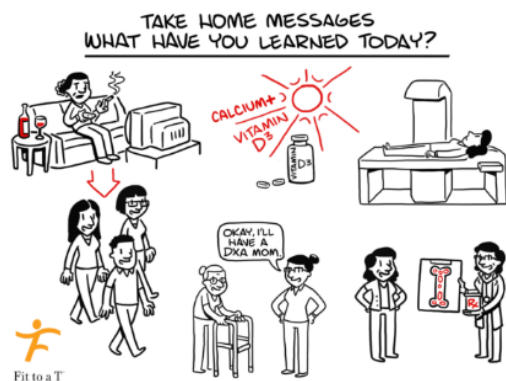
### Key Points



Please record participants' responses to these questions and return to USBJI:

1. What are the top 3 things you have learned from this session?
2. What lifestyle changes will you make and/or actions take?

## Slide 19 – Take Home Messages



### Slide 19 Specific Learning Objectives

After viewing and discussing **this slide**, participants will be able to:

- Recall key messages from each module of the presentation
- Be able to share information with others
- Know where to go to find additional or updated information

### Key Points



- If you break a bone, that is a very big red flag. You are now at very high risk of breaking more bones, and you must take action. Learn fall prevention exercises and techniques.
- Get tested for bone density.
- Make changes to your surroundings and lifestyle to prevent fractures.
- Fall prevention is key – and there are many options to prevent falls.
- Discuss your risk, tests, treatment and follow-up with your healthcare provider.
- Consider the likelihood other members of your family are at risk of avoidable fractures and inform them.
- If you have broken a bone and your primary health care provider doesn't discuss your bone health, **ASK**.
- Patients see their primary care provider an average of 2 times during the year after a fracture, yet their bone health is not frequently addressed, most likely because of the variety of other health issues.
- Considering the consequences of repeat fractures, participants should be encouraged to let their healthcare provider know that they have had a fracture and ask what the next steps are going to be to prevent another fracture.
- Positive message: Whole purpose of discussion to make you aware of how you can prevent a fracture, and you can change your storyline.

## Closing Slides

- Acknowledgements
- Thank-you to participants
  - Evaluation form!
  - ***Fit to a T*** booklet (blue)
  - Risk Assessment questionnaire
  - Myths and Misperceptions / Things You Can and Can't Change
  - Vitamin D Card
  - National Resource List
  - Bibliography
  - Surgeon General's "What it means to you" booklet

# Additional Information and References

## Slide 3 – Low Bone Mass = Poor Bone Quality

### Additional Information

- Osteoporosis strikes both men and women, but women are afflicted in much greater numbers (1 in 5 of all women, 1 in 2 women over the age of 50, but only 1 in 5 men over the age of 50). The effects of osteoporosis are serious; there are things you can do now to prevent and treat it.
- Low bone mass is sometimes referred to as **osteopenia**—a term adopted by the World Health Organization to define postmenopausal women with a bone mineral density (BM) T-score between -1.0 and -2.5. This term has been adopted by clinicians and radiologists for a diagnosis that has led to treatment with pharmacological agents (e.g., bisphosphonates). Most "bone heads" would use the term "low bone mass" to refer to this group and then use the FRAX tool to calculate fracture risk in order to make treatment recommendations (yes or no) depending on 10-year absolute fracture risk. It is important to point out that **low bone mass is not a disease**, just like prehypertension is not a disease.

### References

*The following sources and their sub-sections have been used to develop content to be covered throughout the presentation.*

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## Slide 4 – Let's Discuss the Life of Your Bone

### Additional Information

### References

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Office of the Surgeon General (US). Bone Health and Osteoporosis: A Report of the Surgeon General. Rockville (MD): Office of the Surgeon General (US); 2004. 2, The Basics of Bone in Health and Disease. <https://www.ncbi.nlm.nih.gov/books/NBK45504/>

## Slide 5 – Which Bones Break Most Often?

### Additional Information

- **A broken bone:** A bone fracture as an adult does not always mean you have osteoporosis – but it could be a warning sign that your bones are weak, especially if the break is from normal activities or during a minor fall.
- **Back pain or spinal deformities:** Back pain that will not quit could be a sign that you have a spinal fracture. This occurs when bones in your back become so weak that they fracture and collapse.
- **Loss of height:** A fractured bone in your spine could collapse onto itself causing you to shrink. Multiple fractures can cause the spine to form a curve causing the disfigurement known as a “Dowager’s Hump.”

### References

United States Bone and Joint Initiative. Burden of Musculoskeletal Diseases in the United States (BMUS). Osteoporosis chapter: <https://www.boneandjointburden.org/fourth-edition/iva2/fragility-fractures>. Accessed March 24, 2020.

International Osteoporosis Foundation. Facts and Statistics. <https://www.iofbonehealth.org/facts-statistics>. Accessed March 24, 2020.

## Slide 6 – Risk Factors for Osteoporosis

### Additional Information

### References

*See references for Slide 3.*

## Slide 7 – Why Did the Fracture Happen?

### Additional Information

- Common reasons for falls include: (also covered in handout booklet for participants)
  - Not using handrails on stairs and grab bars in bathroom
  - Cluttered floors – loose wires, toys, etc.
  - Slippery floors
  - Loose carpets and scatter rugs
  - Tripping over pets
  - Walking in socks or floppy slippers
  - Dim lighting

See Slide 10 for a list of corrective tips.

### References

*See references for Slide 3.*

## Slide 8 – Consequences?

### Additional Information

- According to evidence cited in a presentation by Dr. Neil Binkley (August 2017):
  - 20-24% of people who have had a hip fracture will die in the first year following the fracture, and many other fracture types are associated with an increased risk of death.
  - Hip fracture survivors often experience loss of function and independence, with 40% unable to walk independently and 60% requiring assistance a year later. In the year following a hip fracture, 33% are in a nursing home or totally dependent, placing a significant burden on family members who may have to become caregivers for their loved ones.

### References

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<https://www.ncbi.nlm.nih.gov/pubmed/23873945>

## Slide 9 – Fractures Are Preventable – What You and Your Doctor Should Discuss

### Additional Information

### References

Secondary Fracture Prevention: Consensus Clinical Recommendations from a Multistakeholder Coalition. *JBMR*. 2019. <https://doi.org/10.1002/jbmr.3877>.

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## Slide 10 – Preventing Falls

### Additional Information

For more information on recommended exercise and physical activity, see the American Orthopaedic Association's "*Own the Bone*" and the American Academy of Orthopaedic Surgeons' "*Exercise and Bone Health*".

A **home safety assessment and modifications** could include:

- Use handrails on stairs and grab bars in bathroom
- Keep rooms and especially floors free of clutter
- Keep floor surfaces clean but not slippery
- Place skid-proof backing on carpets and scatter rugs
- Be aware of and careful not to trip over pets in the house
- Wear supportive, low-heeled shoes. Do not walk in socks or floppy slippers
- Use brighter light bulbs in all rooms but reduce glare
- Install ceiling lighting in bedrooms
- Use rubber mat in shower/tub
- Keep a flashlight at bedside
- Check posture in mirror often - stay up straight, avoid forward bent posture
- Use a portable phone and keep phone and electrical wires out of walkways
- Keep a week's supply of prescription medications on hand
- Arrange for daily contact with a family member or neighbor
- Contract with a monitoring company for 24-hour response time in an emergency

**Exercises that can be done at home:** Whether or not you participate in a formal exercise or balance program, there are exercises that can be done at home to help with balance and reduce the risk of falls, such as these (\* means they are OK to do slowly and fast). Remember to always check with your healthcare provider before taking on new activities and be safe, as suggested below:

1. Sitting or standing raise the toes up (dorsiflexion).\*
2. Raise the heels up (plantar flexion).\*
3. Turn toes in and out (ankle inversion and eversion- key points of balance control). \*
4. March in place sitting and/or standing (hip flexion). \*
5. Stand up and sit down – try not to use your hands to push up.
6. Straighten the knees (extension) when sitting and think you are holding 20 pounds at your ankles. \*
7. Walk sideways.
8. Walk backwards.
9. Cross-over steps.
10. High Steps.
11. Single steps left/right and front/back. \*
12. Stand eyes closed and open and turn head left and right. Stand feet together (tandem). Stand heel to toe. Both can be done with eyes open and closed.

To challenge and to improve your balance try doing the exercises 1 or 2 times daily and do 10 -30 repetitions. OK to repeat. **Also, hold onto the kitchen counter or a bureau for support if needed. BE SAFE!!** As you gain more confidence and ability you may remove one hand or reduce your support to 1 finger.

## References

- NIH National Institute of Aging. Falls and Fall Prevention. <https://www.nia.nih.gov/health/topics/falls-and-falls-prevention>
- NIH National Institute of Aging. Go4Life. How to Prevent Falls and Improve Your Balance. <https://go4life.nia.nih.gov/preventing-falls/>
- CDC Compendium of Effective Fall Interventions: What Works for Community-Dwelling Older Adults, 3rd Edition. <https://www.cdc.gov/homeandrecreationalafety/falls/compendium.html>
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Chair Rise Exercise - <https://www.cdc.gov/steadi/pdf/STEADI-Brochure-ChairRiseEx-508.pdf>
- The Potential to Reduce Falls and Avert Costs by Clinically Managing Fall Risk. Judy A. Stevens, PhD, Robin Lee PhD, MPH, American Journal Preventative Medicine, Sept 2018 Volume 55, Issue 3, Pages 290–297, [https://www.ajpmonline.org/article/S0749-3797\(18\)31759-8/fulltext](https://www.ajpmonline.org/article/S0749-3797(18)31759-8/fulltext)
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- U.S. Preventive Services Task Force. Falls Prevention in Community-Dwelling Older Adults: Interventions. April 2018. <https://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/falls-prevention-in-older-adults-interventions1>
- National Council on Aging – 6 Steps to Prevent a Fall. <https://www.ncoa.org/wp-content/uploads/NCOA-6-Steps-to-Prevent-a-Fall.pdf>
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- Kramarow E, Chen L-H, Hedegaard H, Warner M. Deaths from unintentional injury among adults aged 65 and over: United States, 2000–2013. NCHS data brief, no 199, May 2015. National Center for Health Statistics.

## Slide 11 – Measuring Your Bone Mineral Density

### Additional Information

- The **DXA test results** compare bone density to that of a healthy young adult who would have peak bone mass. The results are expressed as a T-score (or a deviation from an average). If the T-score is -1.0 or higher, your bone density is normal. If the T-score is between -1 and -2.5, you have low bone density (osteopenia) and could be headed toward osteoporosis (a score of -2.5 or lower). If the DXA yields a T-score below or equal to -2.5 (osteoporosis), treatment is indicated. The lower the T-score, the higher the risk of fracture.
- A follow-up DXA is covered by Medicare every 24 months, or more often if determined to be medically necessary for monitoring a recommended treatment.
- Under Medicare, women in this age group are entitled to DXA bone density screening. The Task Force also recommends that postmenopausal women aged 50 to 64 get bone mineral density screenings if their 10-year probability of suffering a hip, vertebral, humerus, or wrist fracture is 9.3 percent or greater, based on the Fracture Risk Assessment Tool (FRAX).



## References

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FRAX: Fracture Risk Assessment Tool. <http://www.shef.ac.uk/FRAX>

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Official Position of the ISCD/IOF on the Interpretation and Use of FRAX® in Clinical Practice. 2010.

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*See also Slide 9 Reference to Secondary Fracture Prevention Consensus Recommendations.*

## Slide 12 – Let's Talk About Calcium

### Additional Information

#### References

NIH Office of Dietary Supplements. Calcium. <https://ods.od.nih.gov/factsheets/Calcium-HealthProfessional>

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Aaron K. Saini, Edward J.C. Dawe, Simon M. Thompson, and John W. Rosson. Vitamin D and Calcium Supplementation in Elderly Patients Suffering Fragility Fractures; The Road not Taken. *Open Orthop J.* 2017; 11: 1230–1235. Published online 2017 Oct 31. doi: 10.2174/1874325001711011230. PMID: PMC5721326 Suppl-7, M8.

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Heike A. Bischoff-Ferrari, MD, DrPH; Shalender Bhasin, MBBS; JoAnn E. Manson, MD, DrPH. Preventing Fractures and Falls: A Limited Role for Calcium and Vitamin D Supplements? *JAMA.* 2018;319(15):1552-1553. <https://jamanetwork.com/journals/jama/fullarticle/2678595>

Kahwati LC, Weber RP, Pan H, et al. Vitamin D, Calcium, or Combined Supplementation for the Primary Prevention of Fractures in Community-Dwelling Adults: Evidence Report and Systematic Review for the US Preventive Services Task Force. *JAMA.* 2018;319(15):1600–1612. doi:10.1001/jama.2017.21640 <https://jamanetwork.com/journals/jama/fullarticle/2678621>

<https://www.ncbi.nlm.nih.gov/pubmed/29677308>

*See also Slide 9 Reference to Secondary Fracture Prevention Consensus Recommendations.*

## Slide 13 – Let's Talk About Vitamin D

### Additional Information

The NOF recommends a daily vitamin D intake of 800-1000 IU for adults age 50 years and older. The Institute of Medicine (IOM) Dietary Reference Intakes for vitamin D are 600 IU daily until age 70 years and 800 IU per day for adults age 71 years and older. The IOM recommendations for vitamin D are based on intakes sufficient to maintain a serum 25-OH-D of 20 ng/mL in  $\geq 97.5\%$  of population. A higher serum 25-OH-D level ( $> 30$  to  $32$  ng/mL) is associated with optimal calcium absorption and so is preferred by the NOF, the Endocrine Society, and others. (References provided below.)

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*See also Slide 9 Reference to Secondary Fracture Prevention Consensus Recommendations.*

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## Slide 14 – Let's Talk About Weight-Bearing Physical Activity and Exercise

### Additional Information

### References

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Cheung AM1, Giangregorio L. Mechanical stimuli and bone health: what is the evidence? Ref About more than walking: Curr Opin Rheumatol. 2012 Sep;24(5):561-6. doi: 10.1097/BOR.0b013e3283570238.

# Slide 15 – How Do Medications Work to Strengthen Your Bones

## Additional Information

### Explaining the different types of medication

For many years estrogen/hormone replacement therapy (HRT) has been prescribed to women following menopause because declining estrogen levels contribute to a negative bone balance. While hormone replacement therapy has been somewhat effective in treating osteoporosis, the potential side effects associated with treatment outweigh the benefits (see below).

Fortunately, biomedical research over the past 35 years has discovered a number of new options for treatment. We now have at our disposal medications that can specifically target the key cells of bone, i.e. osteoclasts (bone resorbing cells) and osteoblasts (bone forming cells). These medications fall into two general categories: antiresorptive agents (inhibit osteoclastic activity) and anabolic agents (stimulate osteoblastic activity).

1) **Antiresorptives** slow down the bone resorption process and help reduce bone loss.

Bisphosphonates have been available for many years and are often the first line of treatment for osteoporosis. They work by decreasing osteoclastic-mediated bone loss and helping to prevent spine and hip fractures. By decreasing bone loss, they increase bone density. These medications include Alendronate (Fosamax), Risedronate (Actonel), Ibandronate (Boniva), Zoledronate (Reclast). Some are now available as generics. Oral bisphosphonates have potential side effects. They can cause esophageal irritation, so must be taken with 4-6 oz. of water while in a sitting or standing position and patients must fast for at least 30 minutes after taking the drug. Intravenous bisphosphonates (e.g. zoledronic acid [Reclast]) avoid these potential gastrointestinal side effects. However, moreover, bisphosphonates have been reported to have rare adverse effects in long bones and mandibular and maxillary jaw bones (see below).

Another class of antiresorptive agents includes biological agents such as Denosomab (Prolia). Prolia depresses the signals the body uses to stimulate osteoclast cell formation. Prolia is administered by injection by a health care professional, twice per year.

As with all antiresorptive agents, it is important to maintain adequate intake of calcium and vitamin D.

2) **Anabolics** stimulate new bone formation. Anabolic medications aim to boost the body's natural bone-building process by activating osteoblast cells. The type prescribed will depend on an individual patient's situation and the approved indication.

1) There are two approved anabolic agents based on parathyroid hormone (PTH). Teriparatide (Forteo) is a daily injection designed to improve bone health and decrease the risk of broken bones. Abaloparatide (Tymlos) is a synthetic analog of PTHrP that is also given by daily injection to boost the natural process to build new bone by activating osteoblast cells and thus decrease fracture risk.

2) Romosozumab (Evenity) is an anabolic treatment with the dual function to unlock a body's natural ability to build new bone and to a lesser degree slow down bone loss at the same time. It is given once a month by intravenous administration for one year.

Anabolic therapy may be prescribed for a limited length of time and then should be followed by antiresorptive therapy.

3) **Other forms of treatment:**

1) ERT or estrogen therapy is frequently used to prevent osteoporosis in postmenopausal women. However, there are significant side effects from taking estrogen or other female hormone replacement therapy. The current recommendation is to use these at the lowest dose possible for the shortest time possible to treat symptoms of menopause, such as hot flashes, and not to treat osteoporosis. Other medications are available to treat osteoporosis with fewer side effects.

- 2) Medications made from naturally occurring hormones, such as calcitonin, may prevent spinal fractures and give some pain relief as well. However, they have minimal impact on bone density and do not prevent hip fractures.
- 3) SERMs or “selective estrogen receptor modulators”, (such as Raloxifene [Evista]), are used in both prevention and treatment of osteoporosis to increase bone mass while decreasing the risk of both spinal fractures and breast cancer; they have not been shown to prevent hip fractures. They don’t have the same negative effect on the cardiovascular and gynecological tissues as does traditional female hormone replacement therapy. However, since they are based on female hormones, they are not used for treatment of osteoporosis in men. The male hormone testosterone is not typically used for treatment of osteoporosis, unless loss of this hormone in younger men led to osteoporosis. Loss of testosterone occurs naturally with aging; testosterone is not replaced in older men due to the significant side effects from this medication.

**Rare possible side effects of treatment:** Treatments that are FDA-approved wherein the benefits outweigh the risks are supported by evidence-based recommendations from professional societies. Nonetheless, there can be rare adverse events. Osteonecrosis of the jaw and atypical femur fractures have rarely been seen in patients treated with bisphosphonates and denosumab. The former is more common among patients with poor dentition or who have invasive oral surgery, such as a tooth extraction, while being treated. The risks of these are very low - lower than the risk of fractures in most patients who need to be treated. However, the risk is never zero. In fact, these sometimes occur in patients not treated with any osteoporosis medication. Encourage participants to speak with their health care provider about their specific risks, and they may want to have a dental exam prior to starting bisphosphonate medication.

**Adherence:** Adherence to oral medication prescribed for osteoporosis is poor- about 20% at one year after the fracture. This is most likely because osteoporosis isn’t symptomatic after the fracture heals. Reinforce to participants the need to take their medication as prescribed - for as long as it’s prescribed. Mention to them that they won’t feel any different while taking the medicine, but it’s working and should help to prevent other fracture.

#### **Fracture Liaison Services**

- Programs, such as “Own The Bone”, initiated by clinic/hospital to ensure there is follow-up following a fracture to help avoid further fractures
- Letter from the person treating your fracture may be sent to your primary health care provider

Own The Bone is a quality improvement program, developed by the American Orthopaedic Association, to address the osteoporosis treatment gap and prevent subsequent fragility fractures. Through a clinically-proven, web-based patient registry and 10 prevention measures, Own the Bone provides tools and helps institutions to establish a fracture liaison service (FLS) in which a care coordinator (normally a nurse, nurse practitioner or a physician assistant) ensures that post-fracture patients are identified and receive appropriate evaluation, diagnosis, and treatment, under the supervision of their primary care physician, orthopaedic surgeon or osteoporosis specialist.

<http://www.ownthebone.org>

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*See also Slide 9 Reference to Secondary Fracture Prevention Consensus Recommendations.*

## Slide 16 – Red Flags

### Additional Information

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## Slide 17 – Ethnicity & Osteoporosis

### Additional Information

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