



NATIONAL
OSTEOPOROSIS
FOUNDATION

Healthy Bones For Life

CLINICIAN'S GUIDE



INTRODUCTION

Healthy Bones For Life.....	3
-----------------------------	---

SECTION 1

How Bones Change and Grow.....	5
--------------------------------	---

SECTION 2

Strong Bones are Important Starting at an Early Age.....	7
--	---

SECTION 3

What is Osteoporosis?	9
-----------------------------	---

SECTION 4

Who Gets Osteoporosis?.....	11
-----------------------------	----

SECTION 5

What is Low Bone Mass?	15
------------------------------	----

SECTION 6

What Women and Men Need to Know.....	17
--------------------------------------	----

SECTION 7

Bone Mineral Density Test.....	20
--------------------------------	----

SECTION 8

Understanding the BMD Test.....	23
---------------------------------	----

SECTION 9

Exercise	26
----------------	----

SECTION 10

What Happens Next?	31
--------------------------	----

SECTION 11

Treating Osteoporosis.....	35
----------------------------	----

SECTION 12

Participating in Clinical Trials.....	40
---------------------------------------	----

SECTION 12

Resources.....	41
----------------	----

INTRODUCTION

Healthy Bones For Life

OBJECTIVE

The purpose of this osteoporosis training guide is to provide clinicians and health educators with an outline to guide a conversation with patients about their skeletal health and provide information about treatment and fracture prevention.



**TIPS FOR
SUCCESS**

- Understand the patient's goals.
- Choose those topics that are most relevant to the patient.
- Allow time for questions.
- Periodically, use “teach back” techniques to ascertain retention and understanding of information.
- Foster the patient's sense of self-efficacy and provide encouragement and support.

**PATIENTS HAVE
BETTER
OUTCOMES
IF THEY:**

- Understand the disease process.
- Understand what the treatment plan is expected to achieve.
- Understand how the treatment or medication works.
- Believe the treatment is doing something good or positive for them.
- Feel capable of managing the disease.
- Feel supported throughout the course of treatment.

SECTION 1

How Bones Change and Grow

OBJECTIVE

By the end of Section 1, patients will be able to:

- Briefly describe the bone growth cycle throughout life.
- Identify the period of life when bones are the most dense.

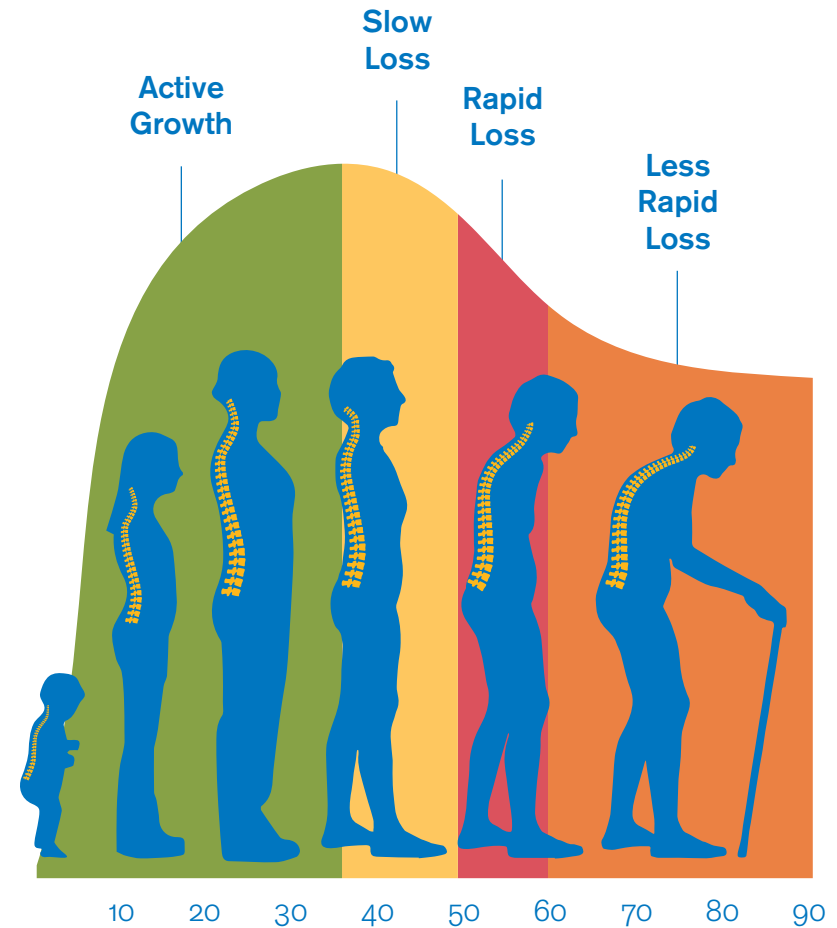


**POINTS TO
EMPHASIZE**

- During our mid-20's our bones are the most dense.

As we age, some of our bone cells begin to dissolve the bone matrix. This is known as bone resorption. New bone cells are also formed in a process known as bone formation. Together these two processes are known to scientists as bone remodeling, which is a normal natural process.

- For women, the period when bone loss is most rapid is the first 5 to 7 years after menopause.
- Men also lose bone as they age at a more gradual pace and about 10 years later than women.

BONE GROWTH & LOSS

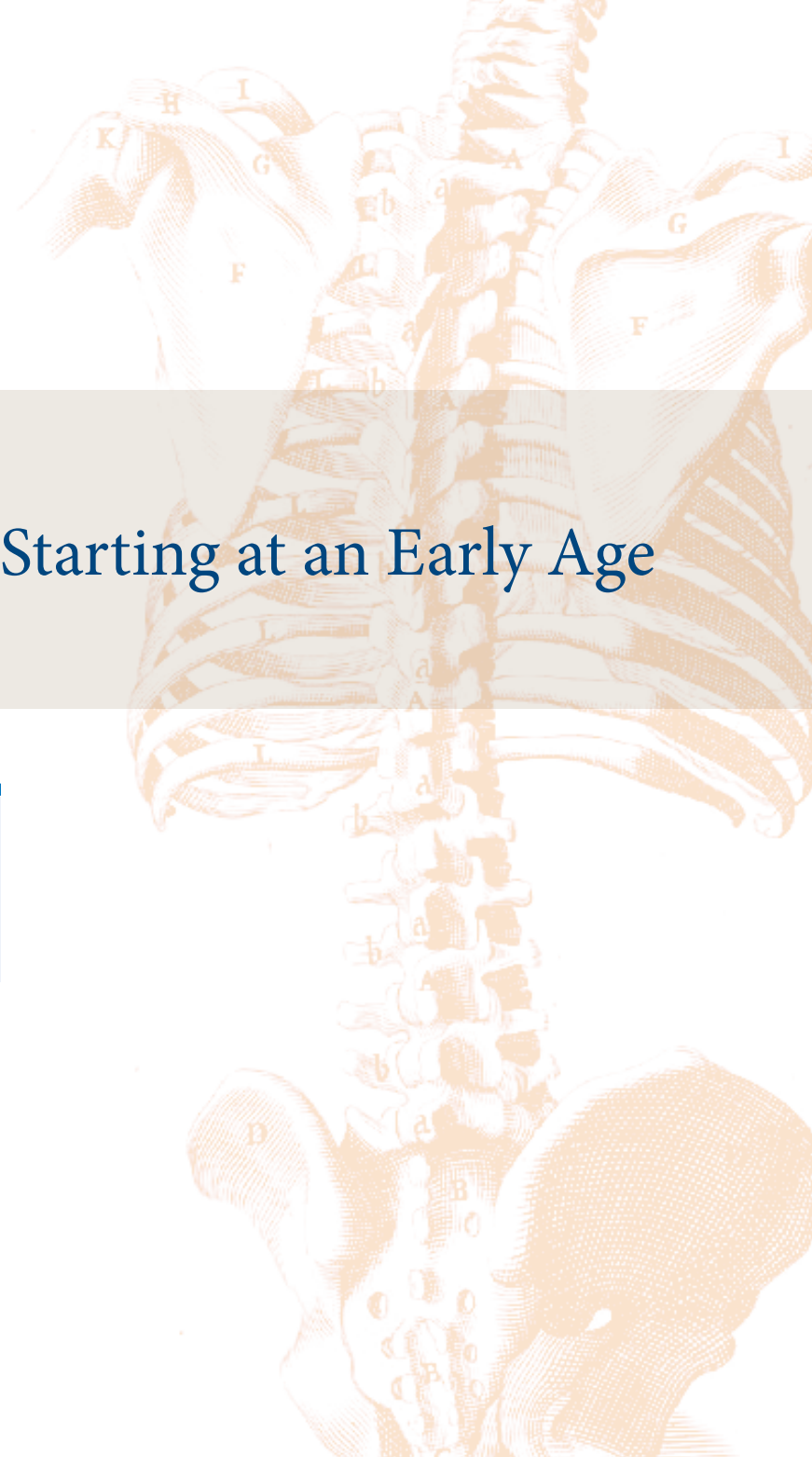
SECTION 2

Strong Bones are Important Starting at an Early Age

OBJECTIVE

By the end of Section 2, patients will be able to:

- Briefly describe lifestyle requirements for strong bones.
- Identify nutrients needed by bones for good health.



**POINTS TO
EMPHASIZE**

- When bone loss exceeds bone growth, the structure becomes more porous, brittle, and prone to fracture.
- Several lifestyle changes can help keep bones strong throughout the lifecycle.
- Bone is a living tissue and just like all other tissues, it requires nutrients from food to stay healthy.

Adequate intakes of nutrients such as calcium, and vitamin D are vital for building strong bones.

- The best source of dietary calcium is from dairy foods.
Vitamin D is harder to obtain from the diet, but is generated by the skin when exposed to sunlight.
- Other nutrients such as magnesium, vitamin K, protein, and dietary fiber, among others are also important.
- Good diet and physical activity patterns may help build stronger bones earlier in life, leading to stronger bones later in life.

SECTION 3

What is Osteoporosis?

OBJECTIVE

By the end of Section 3, patients will be able to:

- State that osteoporosis is a very common condition.
- Briefly describe the relationship between osteoporosis and broken bones or fractures.



**POINTS TO
EMPHASIZE**

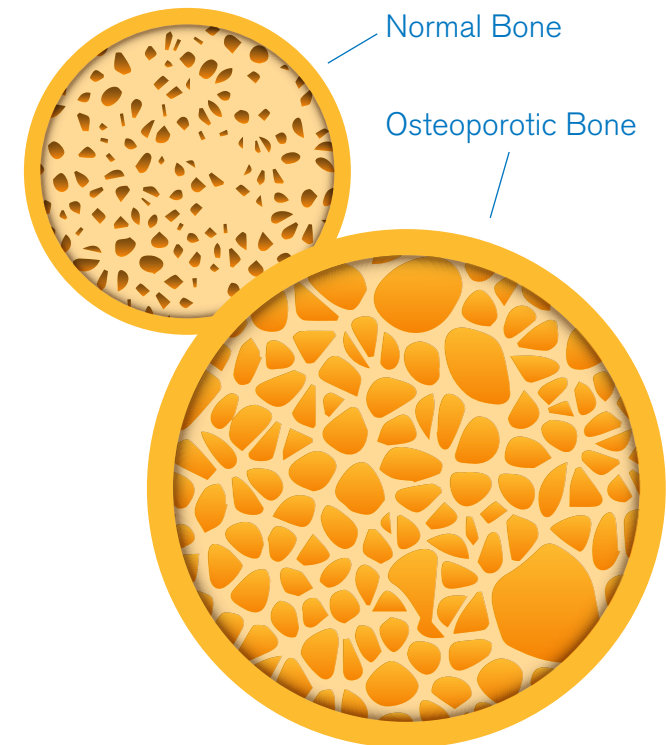
- Osteoporosis, which literally means porous bone, is a disease in which the density and quality of bone are reduced.

In other words, the bones become more weak and brittle.

- As bones become more porous and fragile, the risk of fracture is greatly increased.

The loss of bone occurs silently and progressively. Often there are no symptoms until the first fracture occurs.

- Spinal compression fractures are the most common—tiny fractures that can cause the vertebrae to collapse and alter the shape of the spine.
- Hip fractures can cause lasting mobility problems and even increase the risk of death.
- Wrist, pelvic, and other fractures are also common in people with osteoporosis.



SECTION 4

Who Gets Osteoporosis?

OBJECTIVE

By the end of Section 4, patients will be able to:

- List a minimum of three risk factors for developing osteoporosis that cannot be changed.
- List a minimum of three risk factors for developing osteoporosis that can be changed.



**POINTS TO
EMPHASIZE**

- Affects both men & women.
- More common with advancing age.
- While osteoporosis is more common in women, 20% of people with osteoporosis are men.

Family history of osteoporosis or fracture, especially parental history of hip fracture, confers increased risk. The patient should also be asked about height loss in parents and/or the presence of kyphosis or a Dowagers hump, which may signal the presence of osteoporosis.

- Caucasians, Asian Americans and Latinos are more likely to get the disease than African Americans.
- It's important to have a healthy diet that is rich in fruits and vegetables.
- Patients also need to get enough calcium and vitamin D in addition to other nutrients.
- Another risk factor that can be changed is lack of exercise.

For healthy bones, one should try to exercise at least 30 minutes on most days, including weight bearing and muscle strengthening exercise.

- Avoid smoking and excessive alcohol intake. Drinking three or more alcoholic drinks a day can harm the bones.
- Certain health conditions and some medications are associated with bone loss and osteoporosis.

WHAT CAN CAUSE OR CONTRIBUTE TO OSTEOPOROSIS & FRACTURES

Conditions, Diseases and Medications

Lifestyle factors

Alcohol abuse
Excessive thinness
Excess Vitamin A
Frequent falling
High salt intake
Immobilization
Inadequate physical activity
Low calcium intake
Smoking (active or passive)
Vitamin D insufficiency

Genetic diseases

Cystic fibrosis
Ehlers-Danlos
Gaucher's disease
Glycogen storage diseases
Hemochromatosis
Homocystinuria
Hypophosphatasia
Marfan syndrome
Menkes steely hair syndrome
Osteogenesis imperfecta
Parental history of hip fracture
Porphyria
Riley-Day syndrome

Hypogonadal states

Androgen insensitivity
Anorexia nervosa
Athletic amenorrhea
Hyperprolactinemia
Panhypopituitarism
Premature menopause (< 40 yrs)
Turner's & Klinefelter's syndromes

Endocrine disorders

Central obesity
Cushing's syndrome
Diabetes mellitus (Types 1 & 2)
Hyperparathyroidism
Thyrotoxicosis

Gastrointestinal disorders

Celiac disease
Gastric bypass
Gastrointestinal surgery
Inflammatory bowel disease
Malabsorption
Pancreatic disease
Primary biliary cirrhosis

Hematologic disorders

Hemophilia
Leukemia and lymphomas
Monoclonal gammopathies
Multiple myeloma
Sickle cell disease
Systemic mastocytosis
Thalassemia

Rheumatologic and autoimmune diseases

Ankylosing spondylitis
Other rheumatic and autoimmune
diseases
Rheumatoid arthritis
Systemic lupus

WHAT CAN CAUSE OR CONTRIBUTE TO OSTEOPOROSIS & FRACTURES

Conditions, Diseases and Medications (*Continued*)

Neurological and musculoskeletal risk factors

Epilepsy
Multiple sclerosis
Muscular dystrophy
Parkinson's disease
Spinal cord injury
Stroke

Miscellaneous conditions and diseases

AIDS/HIV
Amyloidosis
Chronic metabolic acidosis
Chronic obstructive lung disease
Congestive heart failure
Depression
End stage renal disease
Hypercalciuria
Idiopathic scoliosis
Post-transplant bone disease
Sarcoidosis
Weight loss

Medications

Aluminum (in antacids)
Anticoagulants (heparin)
Anticonvulsants
Aromatase inhibitors
Barbiturates
Cancer chemotherapeutic drugs
Depo-medroxyprogesterone (premenopausal
contraception)
Glucocorticoids (≥ 5 mg/d prednisone or equivalent for
 ≥ 3 months)
GnRH (Gonadotropin releasing hormone) agonists
Lithium Cyclosporine A and tacrolimus
Methotrexate
Parenteral nutrition
Proton pump inhibitors
Selective serotonin reuptake inhibitors
Tamoxifen® (premenopausal use)
Thiazolidinediones (such as Actos® and Avandia®)
Thyroid hormones (in excess)

SECTION 5

What is Low Bone Mass?

OBJECTIVE

By the end of Section 5, patients will be able to:

- Explain the significance of low bone mass.
- Discuss at least one approach for treating low bone mass.



**POINTS TO
EMPHASIZE**

- Causes of low bone mass include family history, not developing good bone mass when you are young, and certain conditions or medicines.

Not everyone who has low bone mass gets osteoporosis. But everyone with low bone mass is at higher risk for getting it.

- In patients with low bone mass, bone loss may be slowed down through proper nutrition and exercise.

This includes eating foods rich in calcium and vitamin D and doing weight-bearing exercise such as walking, bowling or dancing.

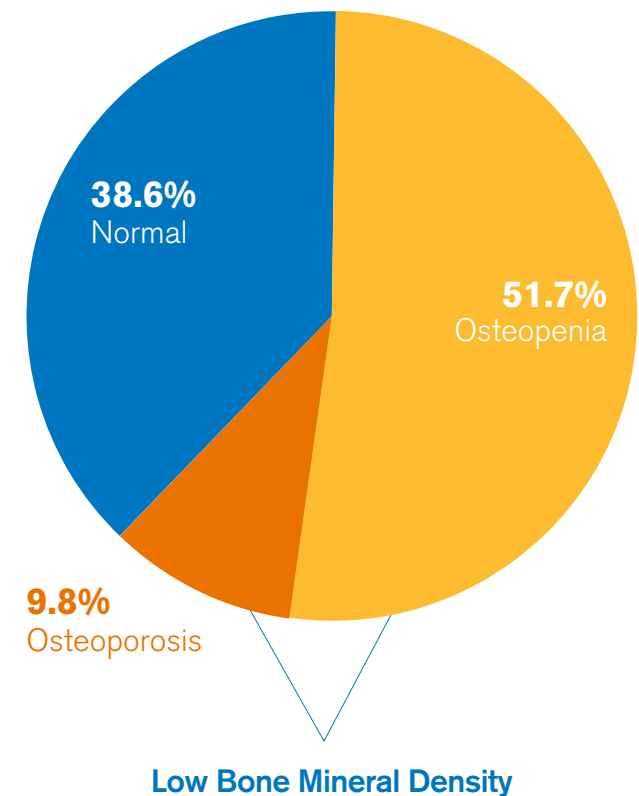
- Low bone mass, in conjunction with clinical risk factors, may put one at increased risk of fracture.

Fracture risk may be further evaluated with tools such as FRAX to help estimate the 10 year probability of fracture in patients with low bone mass.

- The FRAX score is most useful in the patient with low bone mass to help identify those patients who may need medication.

Consider medication therapy in postmenopausal women and men age 50 and older with low bone mass (T-score between -1.0 and -2.5 , osteopenia) at the femoral neck, total hip, or lumbar spine by DXA and a 10-year hip fracture probability $\geq 3\%$ or a 10-year major osteoporosis-related fracture probability $\geq 20\%$ based on the USA-adapted WHO absolute fracture risk model.

(Fracture Risk Algorithm (FRAX®); www.nof.org and www.shef.ac.uk/FRAX)



SECTION 6

What Women and Men Need to Know

OBJECTIVE

By the end of Section 6, patients will be able to:

- Identify a minimum of two gender-based facts about osteoporosis or low bone density.



WHAT WOMEN NEED TO KNOW

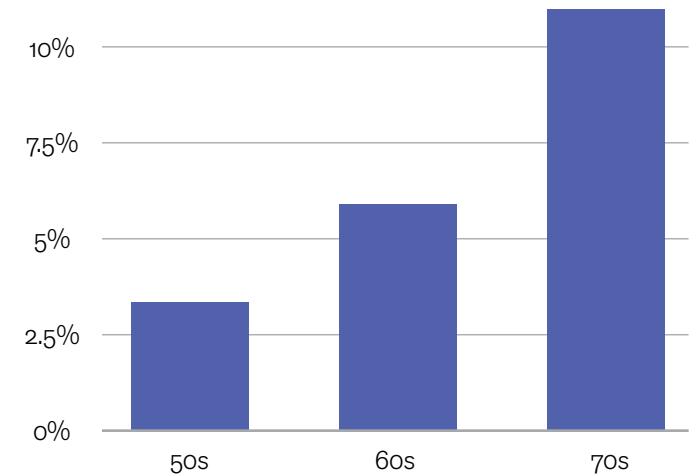
- Estrogen is a hormone that helps protect bone and low estrogen levels can lead to bone loss.
- All women go through menopause and it leads to lower estrogen levels, which cause bone loss.
- Women's bones are generally thinner than men's & bone density has a rapid decline for a time after menopause.

Women can lose up to 20% of their bone density in the 5-7 years after menopause.

- Some treatments for breast cancer (aromatase inhibitors) can also cause osteoporosis.
- Because of midlife hormonal shifts, osteoporosis starts earlier in women than in men.
- 80% of Americans with osteoporosis are women.

OSTEOPOROTIC FRACTURE PROBABILITY BY AGE FOR WOMEN

Risk shown for patients with $T \leq -2.5$



Data from United Kingdom Adapted from Kanis et al. 2008b

Average Age of Onset	65 years
Lifetime Incidence of Osteoporotic Fracture	25%
Fraction of Hip Fractures Due to Osteoporosis	70%
Criteria Used to Diagnose	$T \leq -2.5$ or Fragility Fracture

WHAT MEN NEED TO KNOW

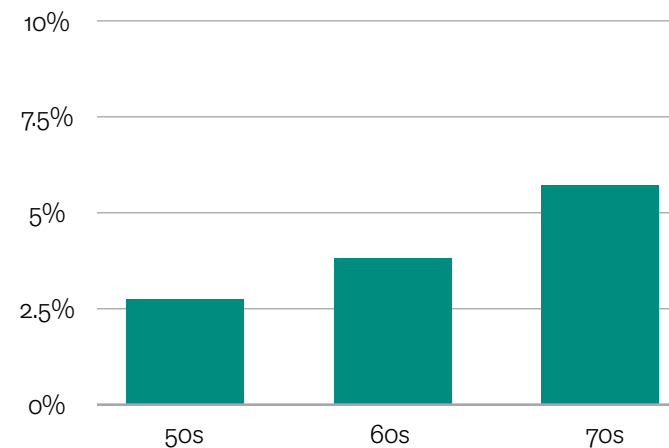
- Osteoporosis also affects men and older men who have a fracture have worse outcomes than women.
- Up to one in four men over the age of 50 will break a bone due to osteoporosis.
- Osteoporosis is associated with some male-only conditions.

For example, abnormally low testosterone levels (hypogonadism).

- Low testosterone levels put men at risk.
- Some treatments for prostate cancer can cause osteoporosis (androgen deprivation therapy).
- Men who break a hip or wrist are less likely than women to get treated for osteoporosis.
- Men may, however, have fewer treatment choices at this time because some drugs have been tested only in women.
- Starting at about age 65, both sexes lose bone at about the same rate.

OSTEOPOROTIC FRACTURE PROBABILITY BY AGE FOR MEN

Risk shown for patients with $T \leq -2.5$



Data from United Kingdom Adapted from Kanis et al. 2008b

Average Age of Onset	75 years
Lifetime Incidence of Osteoporotic Fracture	13%
Fraction of Hip Fractures Due to Osteoporosis	30%
Criteria Used to Diagnose	$T \leq -2.5$ or Fragility Fracture

SECTION 7

Bone Mineral Density Test

OBJECTIVE

By the end of Section 7, patients will be able to:

- Describe how bone density is measured.
- List at least two reasons for a bone density test to be performed.



**POINTS TO
EMPHASIZE**

- While many tests are used to look at bones, the bone density test is the only one that can diagnose osteoporosis.
- Experts recommend a type of bone density test of the hip and/or spine using a machine called a central DXA.

**INDICATIONS FOR
BMD TESTING****Consider BMD testing in the following individuals:**

- Women age 65 and older and men age 70 and older, regardless of clinical risk factors.
- Younger postmenopausal women, women in the menopausal transition and men age 50 to 69 with clinical risk factors for fracture.
- Adults who have a fracture age 50 and older.
- Adults with a condition (e.g., rheumatoid arthritis) or taking a medication (e.g., glucocorticoids in a daily dose ≥ 5 mg prednisone or equivalent for \geq three months) associated with low bone mass or bone loss.

**INDICATIONS FOR
VERTEBRAL
IMAGING****Consider vertebral imaging tests for the following individuals: *****

- All women age 70 and older and all men age 80 and older if BMD T-score at the spine, total hip or femoral neck is < -1.0 .
- Women age 65 to 69 and men age 70 to 79 if BMD T-score at the spine, total hip or femoral neck is < -1.5 .
- Postmenopausal women and men age 50 and older with specific risk factors:
 - Low trauma fracture during adulthood (age 50 and older).
 - Historical height loss of 1.5 inches or more (4 cm). *
 - Prospective height loss of 0.8 inches or more (2 cm). **
 - Recent or ongoing long term glucocorticoid treatment.

* Current height compared to peak height during young adulthood.

** Cumulative height loss measured during interval medical assessment.

*** If bone density testing is not available, vertebral imaging may be considered based on age alone.

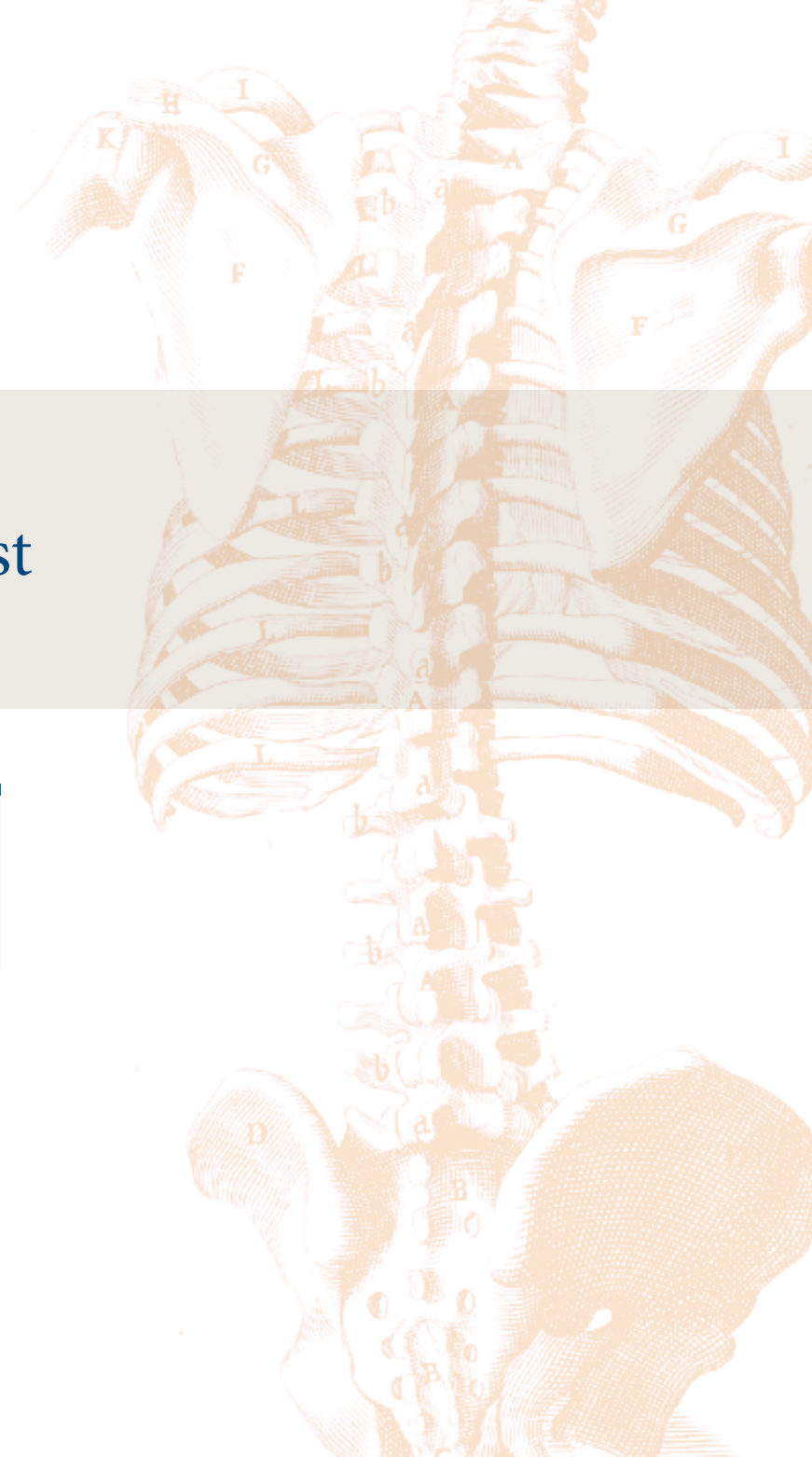
SECTION 8

Understanding the BMD Test

OBJECTIVE

By the end of Section 8, patients will be able to:

- Understand how BMD tests are interpreted.
- Discuss why Z-scores are performed.



DEFINING
OSTEOPOROSIS
BY BMD

WHO Definition of Osteoporosis Based on BMD

Classification	BMD	T-score
Normal	Within 1 SD of the mean level for a young-adult reference population	T-score at -1.0 and above
Low Bone Mass (Osteopenia)	Between 1.0 and 2.5 SD below that of the mean level for a young-adult reference population	T-score between -1.0 and -2.5
Osteoporosis	2.5 SD or more below that of the mean level for a young-adult reference population	T-score at or below -2.5
Severe or Established Osteoporosis	2.5 SD or more below that of the mean level for a young-adult reference population	T-score at or below -2.5 with one or more fractures

Note: Although these definitions are necessary to establish the presence of osteoporosis, they should not be used as the sole determinant of treatment decisions.

Z-SCORE

- Sometimes the bone mineral density is compared to that of a typical individual whose age is age-matched.
- Used to evaluate BMD in children and adolescents.
- Also used in adults.
- Compares a person's BMD to what is expected in another person of the same age and body size.
- Useful for determining whether an underlying disease or condition is causing bone loss.

SECTION 9

Exercise

OBJECTIVE

By the end of Section 9, patients will be able to:

- Discuss the benefits of exercise for skeletal health.
- List safety considerations for exercise by people with osteoporosis.



**POINTS TO
EMPHASIZE**

- The two types of exercises that are important for keeping bones strong are weight-bearing and muscle-strengthening exercises.
- Posture exercises are also important and may help expand the lungs and strengthen back muscles.
- Balance exercises can help prevent falls.

**WEIGHT-BEARING
EXERCISES**

- In weight-bearing exercise, one's bones support the weight of the body.
- Certain movements in Pilates and yoga are also considered muscle-strengthening exercises.

If one has osteoporosis or is at risk of breaking a bone, certain movements or poses in yoga, Pilates and other forms of exercise may need to be avoided or modified.
- Muscle strengthening options: lifting weights (machines or free weights), calisthenics (partial or full push ups, wall sits, prone trunk lifts), exercise bands.

**POSTURE
EXERCISE**

- Recommend posture exercises for patients with rounded or “sloping” shoulders.

**BALANCE
EXERCISE**

- Recommend balance exercises for patients who have had a fall within the past year or for patients with an increased risk of falls.
- Consider physical therapy referrals for patients with balance issues.

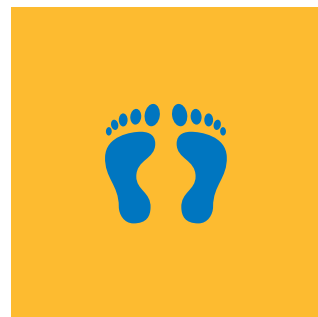
BALANCE EXERCISE



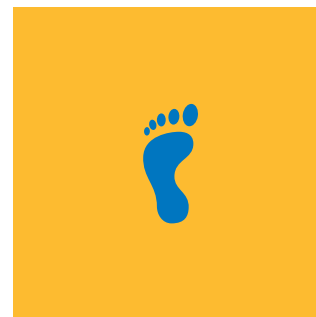
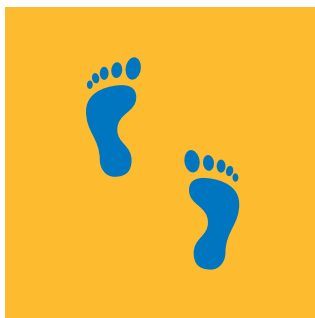
Wide Stance



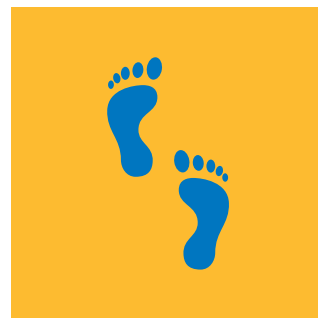
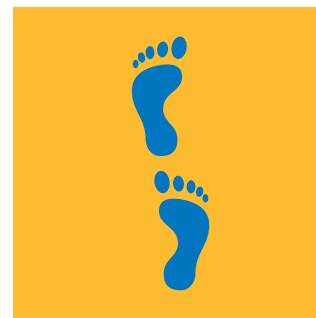
Normal Stance



Narrow Stance

Single limb*
other foot in the air*Wide
Semi-tandem

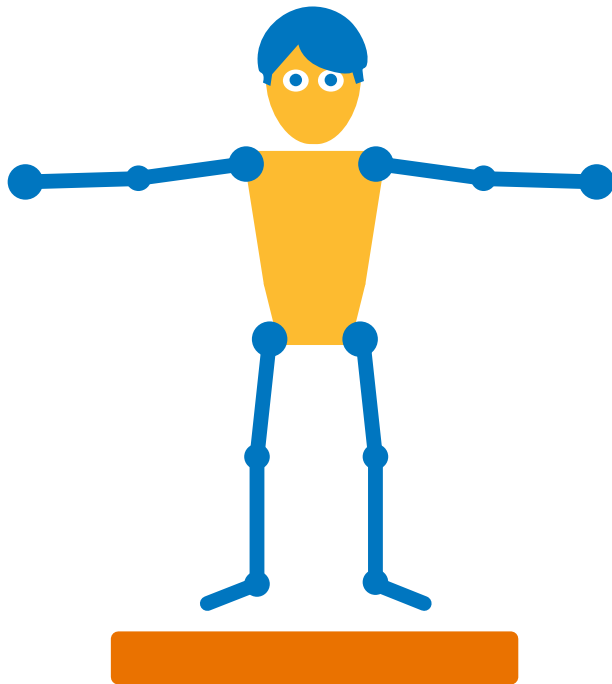
Semi-tandem

Tight
Semi-tandem*

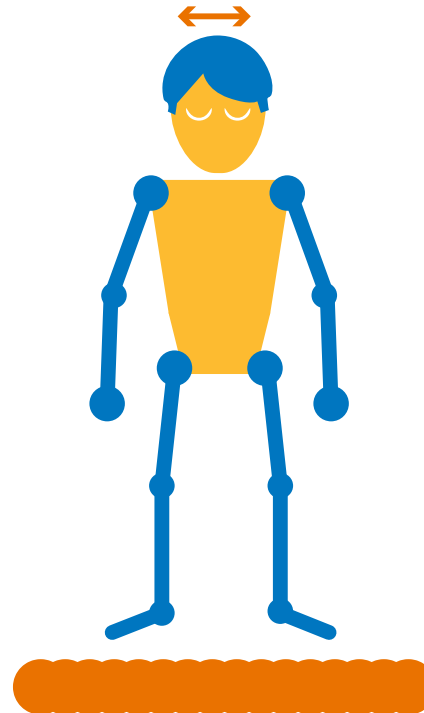
Full tandem*

* Use extreme caution

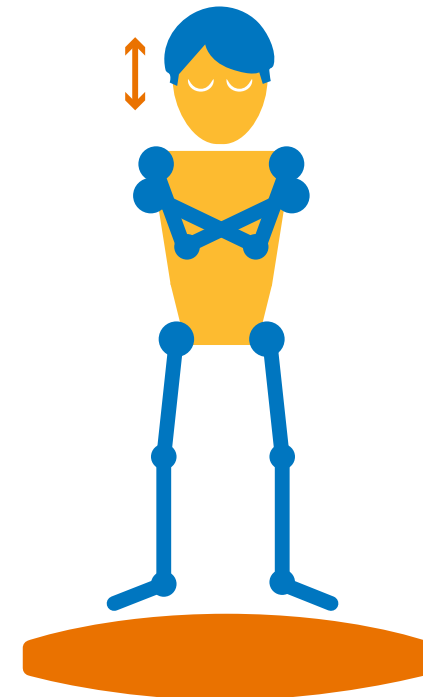
BALANCE EXERCISE



- Eyes:** Open
Head: Focus on an object in front of you
Arms: Reach out to the sides
Shoes: Hard sole shoes
Surface: Solid floor (linoleum)



- Eyes:** Closed*
Head: Turn right to left
Arms: At your sides
Shoes: No shoes
Surface: Soft floor (carpet)



- Eyes:** Closed*
Head: Tilt up and down
Arms: Crossed on your chest
Shoes: Soft sole shoes
Surface: Compliant surface (pillow, foam, balance disc*)

* Use extreme caution

SECTION 10

What Happens Next?

OBJECTIVE

By the end of Section 10, patients will be able to:

- List the components of a comprehensive treatment plan for osteoporosis.
- State the recommended daily intake of calcium and vitamin D.



**POINTS TO
EMPHASIZE**

- **Diet questions:**
 - Do you eat plenty of fruits & vegetables daily?
 - Are you getting enough calcium and vitamin D?
 - Do you do exercises that are good for your bones?
 - Can you think of any healthy lifestyle changes that you will make?

**RECOMMENDED
TREATMENT**

- **Medications: Depending on your age, certain medicines may be more appropriate than others.**

Most of the medicines are only approved for women who have reached menopause.

- **It is difficult to get all of the vitamin D you need from food.**

You can get small amounts from a few foods, including liver and fatty fish like mackerel, salmon and tuna.

**CALCIUM &
VITAMIN D
SUPPLEMENTATION**

- Calcium and vitamin D are important throughout your life, especially when you are growing.
- For women, it is especially important to get enough calcium and vitamin D when you are pregnant or breastfeeding.
- Supplement to make up any shortfall from your diet.
- If you take a calcium supplement, don't take it all at once-spread it out over two or three doses per day.
- Take your calcium supplement with food.
- Your body absorbs calcium best in amounts of 600 mg or less.
- Don't take an iron supplement at the same time as your calcium supplement.
- Supplementation is safe way to meet recommended intakes (just try not to exceed).

**VITAMIN D
SUPPLEMENTATION**

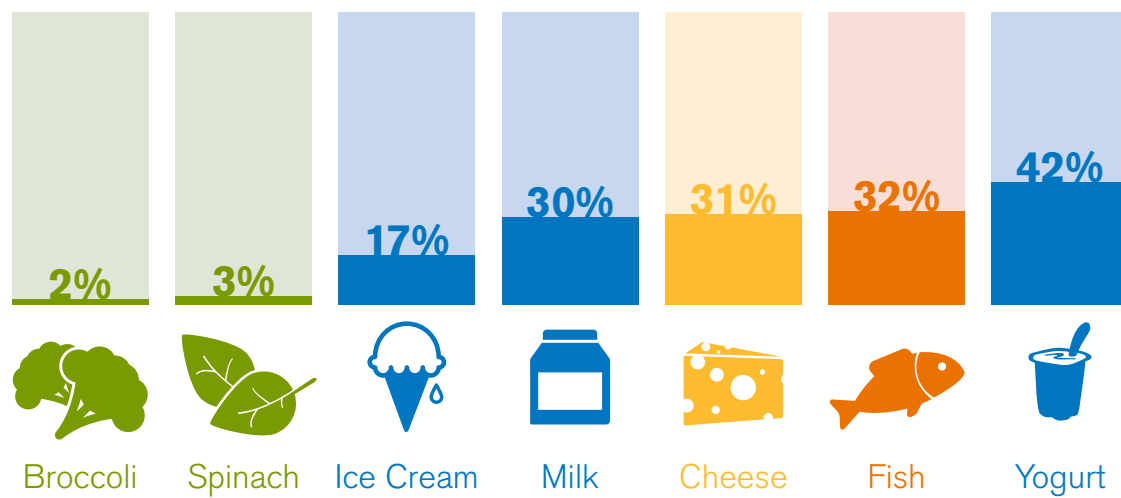
- It is also called cholecalciferol or vitamin D3.
- Most calcium supplements contain vitamin D.
- Your healthcare provider can run a simple blood test to see what your vitamin D level is.
- It is very difficult to get enough of vitamin D from food alone, so many people will need to take a vitamin D supplement.

**CREATING THAT
HEALTHY
LIFESTYLE**

- Try to get the daily amount of calcium from the diet first and take a supplement only if needed to make up the shortfall.
- Fish such as salmon, tuna, and mackerel also contain vitamin D, which helps us absorb calcium.
- Some foods and drinks such as cereals and orange juice are also fortified with calcium and vitamin D.
- Drinking a glass of vitamin D-fortified milk is one of the best ways to get your calcium.
- Yogurt and cheese are better choices than ice cream or frozen yogurt.

VITAMIN D RICH FOODS

Percentage of daily value



SECTION 11

Treating Osteoporosis

OBJECTIVE

By the end of Section 11, patients will be able to:

- Explain the benefits of medication therapy for patients with osteoporosis.
- Explain the potential risks associated with medication therapy for patients with osteoporosis and fractures.



**POINTS TO
EMPHASIZE**

- Address everything up front.
 - Side effects.
 - Negative news media.
 - Access to biased information (Google and other internet searches).
 - The know-it-all neighbor.
- Use visual aids to explain key points.
- Patient handouts to reinforce teaching.

**ANABOLIC
MEDICINE**

Stimulates your
body to make new
bone more quickly

Increases your
bone density

Lowers your risk of
breaking bones

- Only type of osteoporosis treatment that builds new bone.
- Generic name: teriparatide.
- It significantly increases bone mineral density, especially in the spine, and reduces fractures in the spine and nonvertebral sites.

**ANTIRESORPTIVE
MEDICINES**

Slow the breakdown
of bone

Maintain or improve
bone density

Lower the risk of
breaking bone

- When you first start taking these medicines, you begin to get the benefits very soon (rate of bone loss slows).
- Because you still make new bone at a normal rate, your bone density might even increase.
- Bisphosphonates can increase bone density and lower the risk of fractures in the spine, hip and nonvertebral sites.
- Estrogen agonist/antagonist medicines can increase bone density and lower the risk of breaking bones in the spine.
- Denosumab reduces the incidence of vertebral, hip and non-vertebral fractures.
- Calcitonin can increase bone density in the spine & lower the risk of breaking bones in the spine, but should be considered only if other medicines are not tolerated or are contraindicated.

OSTEOPOROSIS DRUGS RISKS AND BENEFITS

Bisphosphonates:

- Bisphosphonates like risedronate, alendronate, ibandronate and zoledronic acid can reduce bone loss & fracture risk.
- Those taken by mouth can cause gastrointestinal problems (heartburn, ulcers in the esophagus, acid reflux and nausea); Take exactly as prescribed to minimize side effects (empty stomach, first thing in the morning, with a full glass of water (no other liquid), remain upright for 30-60 minutes. Delayed release risedronate must be taken immediately after breakfast with 4 ounces of plain water.
- Injectable bisphosphonates (1-4 times a year) can cause brief flu-like symptoms.
- Bone pain may occur with all bisphosphonates, often greater with IV formulations.

RANK Ligand inhibitor (Denosumab):

- Slows the breakdown of bone and decreased fracture risk.
- Given as an injection twice a year with side effects including: muscle pain, bone pain, risk of infections, increased risk of rashes and cellulitis.

Calcitonin:

- The weakest agent, this should be considered only if other medications are contraindicated or not tolerated.
- As nasal spray or injection-can slow bone thinning but has side effects such as, runny nose, headache, back pain, flushing, nausea, allergic reactions.

Estrogen and Estrogen-like Agents (women only):

- SERMS and Hormone replacement therapy- Not recommended for everyone because of the risk of cancer, blood clots, heart disease & stroke.

ADHERENCE ISSUES

What happens if osteoporosis is not treated?

- Increased risk of fractures from bumps, falls, or strains that would not have caused a break in earlier years when the bones were stronger.
- Compressed vertebra from fractures in the vertebrae.
- Kyphosis of the spine (stooping posture).

CLINICAL APPROACH TO MANAGING OSTEOPOROSIS IN POSTMENOPAUSAL WOMEN AND MEN AGE 50 AND OLDER

General Principles:

- Obtain a detailed patient history pertaining to clinical risk factors for osteoporosis-related fractures and falls.
- Perform physical examination and obtain diagnostic studies to evaluate for signs of osteoporosis and its secondary causes.
- Modify diet/supplements, lifestyle and other modifiable clinical risk factors for fracture.
- Estimate patient's 10-year probability of hip and any major osteoporosis-related fracture using the U.S.-adapted FRAX and perform vertebral imaging when appropriate to complete risk assessment.
- Decisions on whom to treat and how to treat should be based on clinical judgment using this Guide and all available clinical information.

Consider FDA-approved medical therapies based on the following:

- Vertebral fracture (clinical or asymptomatic) or hip fracture.
- Hip DXA (femoral neck or total hip) or lumbar spine T-score ≤ -2.5 .
- Low bone mass (osteopenia) and a U.S.-adapted WHO 10-year probability of a hip fracture $\geq 3\%$ or 10-year probability of any major osteoporosis-related fracture $\geq 20\%$.
- Patient preferences may indicate treatment for people with 10-year fracture probabilities above or below these levels.

Consider non-medical therapeutic interventions:

- Modify risk factors related to falling.
- Consider referrals for physical and/or occupational therapy evaluation (e.g., walking aids and other assistive devices).
- Weight-bearing, muscle-strengthening exercise and balance training.

Follow-up:

- Patients not requiring medical therapies at the time of initial evaluation should be clinically re-evaluated when medically appropriate.
- Patients taking FDA-approved medications should have laboratory and bone density re-evaluation after two years or more frequently when medically appropriate.
- Vertebral imaging should be repeated if there is documented height loss, new back pain, postural change or suspicious finding on chest x-ray, following the last (or first) vertebral imaging test or in patients being considered for a temporary cessation of drug therapy to make sure no new vertebral fractures have occurred in the interval.
- Regularly, and at least annually, assess compliance and persistence with the therapeutic regimen.

SECTION 12

Participating in Clinical Trials

OBJECTIVE

By the end of Section 12, patients will be able to:

- List possible benefits of participating in clinical trials.

POINTS TO EMPHASIZE

- Protection of human subjects
- Protocol development
- Informed consent process
- Eligibility for clinical trial participation



SECTION 13

Resources

OBJECTIVE

By the end of Section 13, patients will be able to:

- Relate the NOF website address for more information.



**POINTS TO
EMPHASIZE**

Visit the NOF website at www.nof.org

Join the inspire community! [Click Here](#)

If you want to hear more about Osteoporosis and get informed you can purchase any of the following or more on our website:
<http://nof.org/resources>

