

# UNDERSTANDING OSTEOPOROSIS



A Patient Guide






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This booklet will help you learn about osteoporosis, a condition that weakens bones. You will find out what causes it, how it is diagnosed and treated, and what you can do to protect your bones and prevent fractures.

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## WHAT IS OSTEOPOROSIS?



**Osteoporosis** is a disease that weakens bones, making them fragile and more likely to break. The word "osteoporosis" means "porous bone" - bones become less dense and develop holes like a sponge.

Think of it this way: Healthy bone looks like a honeycomb under a microscope - strong and tightly packed. With osteoporosis, the holes in the honeycomb get bigger and the walls get thinner. This makes bones weak and more likely to break from a minor fall or even simple activities like bending over.

### The Silent Disease

Osteoporosis is often called the "silent disease" because bone loss happens without symptoms. Many people don't know they have it until they break a bone.

### Key Terms to Know

**Osteoporosis:** A disease causing weak, brittle bones.

**Bone Density:** How solid and strong your bones are.

**Osteopenia:** Lower than normal bone density, but not yet osteoporosis.

**Fracture:** A broken bone.

#### References:

1. National Osteoporosis Foundation. "What is Osteoporosis?" [nof.org](http://nof.org).
2. National Institute of Arthritis and Musculoskeletal and Skin Diseases. NIAMS, NIH.

# HOW BONES WORK

Your bones are living tissue that constantly renew themselves throughout your life.

## Bone Remodeling

Your body is always breaking down old bone and building new bone:

- Osteoclasts: Cells that break down old bone
- Osteoblasts: Cells that build new bone
- This process keeps bones healthy and repairs damage

## Peak Bone Mass

- Bones grow and strengthen through childhood and young adulthood
- Peak bone mass is reached around age 30
- After that, bone breakdown starts to outpace bone building

## What Bones Need

- Calcium: The main mineral in bones
- Vitamin D: Helps your body absorb calcium
- Exercise: Weight-bearing activity strengthens bones
- Hormones: Estrogen and testosterone help maintain bone

## When Things Go Wrong

In osteoporosis:

- Bone is broken down faster than it's built
- Bones become less dense and weaker
- Risk of fractures increases

## Common Fracture Sites

- Hip
- Spine (vertebrae)
- Wrist

### References:

1. American Bone Health. "How Bone Remodeling Works." [americanbonehealth.org](http://americanbonehealth.org).

## SIGNS & SYMPTOMS

Osteoporosis usually has no symptoms until a bone breaks. That's why screening is so important.

<p>Warning Signs</p>	<ul style="list-style-type: none"> <li>• Breaking a bone from a minor fall or injury</li> <li>• Loss of height over time (more than 1.5 inches)</li> <li>• Stooped or hunched posture</li> <li>• Back pain (may indicate spinal fracture)</li> </ul>
<p>Spinal Compression Fractures</p>	<p>Vertebrae (spine bones) can collapse or compress:</p> <ul style="list-style-type: none"> <li>• May cause sudden, severe back pain</li> <li>• Can happen gradually without pain</li> <li>• Lead to loss of height</li> <li>• Cause curved upper back (kyphosis or "dowager's hump")</li> </ul>
<p>Hip Fractures</p>	<p>The most serious osteoporosis fractures:</p> <ul style="list-style-type: none"> <li>• Usually result from a fall</li> <li>• Require surgery</li> <li>• Can lead to disability and loss of independence</li> <li>• Increase risk of death in the year following</li> </ul>
<p>Fragility Fractures</p>	<p>Fractures from low-impact activities that shouldn't break healthy bones:</p> <ul style="list-style-type: none"> <li>• Falling from standing height or less</li> <li>• Coughing or sneezing forcefully</li> <li>• Bending or lifting light objects</li> </ul>

*If you've had a fragility fracture, talk to your doctor about bone density testing.*

References:

1. National Osteoporosis Foundation. "Signs and Symptoms." [nof.org](http://nof.org).

## RISK FACTORS

Some risk factors you can't change, but many you can:

### Risk Factors You Cannot Change

- Age: Risk increases as you get older
- Sex: Women are at higher risk, especially after menopause
- Family history: Having a parent with osteoporosis or hip fracture
- Body size: Small, thin-boned people have higher risk
- Ethnicity: White and Asian women at highest risk

### Risk Factors You Can Change

- Low calcium and vitamin D intake
- Not enough physical activity
- Smoking
- Excessive alcohol (more than 2 drinks/day)
- Being underweight

### Medical Conditions That Increase Risk

- Rheumatoid arthritis
- Celiac disease and inflammatory bowel disease
- Hyperthyroidism
- Chronic kidney disease
- Early menopause (before age 45)

### Medications That Can Weaken Bones

- Corticosteroids (prednisone) - especially long-term use
- Some seizure medications
- Some cancer treatments
- Proton pump inhibitors (long-term use)

References:

1. National Osteoporosis Foundation. "Risk Factors." [nof.org](http://nof.org).

## DIAGNOSIS

### How is Osteoporosis Diagnosed?

The main test for osteoporosis is a bone density scan:

#### DXA Scan (Bone Density Test)

Also called DEXA or bone densitometry:

- Uses low-dose X-rays to measure bone density
- Usually measures hip and spine
- Quick (about 10-15 minutes) and painless
- No preparation needed
- Very low radiation exposure

#### Who Should Be Screened?

- All women age 65 and older
- All men age 70 and older
- Younger postmenopausal women with risk factors
- Anyone who has had a fracture after age 50
- Anyone taking medications that cause bone loss
- Anyone with conditions that affect bone health

#### Other Tests

Your doctor may also order:

- Blood tests (calcium, vitamin D, thyroid, kidney function)
- X-rays (if fracture suspected)
- FRAX score (fracture risk assessment tool)

#### Follow-Up Testing

- Usually repeated every 1-2 years
- Monitors response to treatment
- Tracks bone density changes over time

#### References:

1. U.S. Preventive Services Task Force. "Osteoporosis Screening." [uspreventiveservicestaskforce.org](https://www.uspreventiveservicestaskforce.org).

# UNDERSTANDING YOUR T-SCORE

Your bone density results are reported as a T-score:

## What is a T-Score?

Your T-score compares your bone density to that of a healthy 30-year-old adult (when bones are at their strongest).

## NORMAL

T-score of -1.0 and above

- Bones are strong
- Continue healthy habits to maintain bone health

## OSTEOPENIA (Low Bone Mass)

T-score between -1.0 and -2.5

- Bones are weaker than normal but not yet osteoporosis
- Higher risk of developing osteoporosis
- Lifestyle changes important; medication may be considered

## OSTEOPOROSIS

T-score of -2.5 and below

- Bones are significantly weakened
- Higher risk of fractures
- Treatment usually recommended

## SEVERE OSTEOPOROSIS

T-score of -2.5 and below PLUS a fracture

- Very high fracture risk
- Treatment strongly recommended

**Example:** A T-score of -2.0 means your bone density is 2 standard deviations below a healthy young adult.

### References:

1. World Health Organization. "Assessment of Fracture Risk." WHO.

# TREATMENT OPTIONS

Treatment can help prevent fractures and may improve bone density.

## Treatment Goals

- Prevent fractures
- Maintain or increase bone density
- Reduce bone loss
- Maintain quality of life

## Who Needs Treatment?

Treatment is usually recommended if you have:

- T-score of -2.5 or lower (osteoporosis)
- Previous hip or spine fracture
- T-score between -1 and -2.5 with high fracture risk

## Treatment Approaches

### 1. Medications

Various medications can slow bone loss or build new bone (see next page)

### 2. Calcium and Vitamin D

- Essential for bone health
- From diet and/or supplements

### 3. Exercise

- Weight-bearing exercise strengthens bones
- Strength training builds muscle and bone
- Balance exercises prevent falls

### 4. Fall Prevention

- Make home safer
- Review medications that cause dizziness
- Check vision regularly

#### References:

1. Endocrine Society. "Osteoporosis Treatment Guidelines." [endocrine.org](http://endocrine.org).

# OSTEOPOROSIS MEDICATIONS

<p style="text-align: center;"><b>BISPHOSPHONATES</b></p>	<p>Most commonly prescribed; slow bone breakdown:</p> <ul style="list-style-type: none"> <li>• Alendronate (Fosamax) - weekly pill</li> <li>• Risedronate (Actonel, Atelvia) - weekly or monthly pill</li> <li>• Ibandronate (Boniva) - monthly pill or quarterly IV</li> <li>• Zoledronic acid (Reclast) - yearly IV infusion</li> </ul>
<p style="text-align: center;"><b>RANK LIGAND INHIBITOR</b></p>	<ul style="list-style-type: none"> <li>• Denosumab (Prolia) - injection every 6 months</li> <li>• Slows bone breakdown</li> <li>• Must not miss or delay doses</li> </ul>
<p style="text-align: center;"><b>BONE-BUILDING MEDICATIONS (Anabolic)</b></p>	<p>For severe osteoporosis or when other treatments haven't worked:</p> <ul style="list-style-type: none"> <li>• Teriparatide (Forteo) - daily self-injection for up to 2 years</li> <li>• Abaloparatide (Tymlos) - daily self-injection for up to 2 years</li> <li>• Romosozumab (Evenity) - monthly injection for 1 year</li> </ul>
<p style="text-align: center;"><b>HORMONE THERAPY</b></p>	<ul style="list-style-type: none"> <li>• Estrogen therapy (for some postmenopausal women)</li> <li>• Raloxifene (Evista) - estrogen-like drug for spine protection</li> </ul>

## Important Notes

- All patients should also take adequate calcium and vitamin D
- Treatment choice depends on fracture risk, medical history, preferences
- Each medication has specific instructions - follow them carefully

### References:

1. American Association of Clinical Endocrinology. "Osteoporosis Guidelines." aace.com.

## BUILDING STRONG BONES

Lifestyle changes are important for everyone with osteoporosis:

### Calcium

- Women over 50 and men over 70: 1,200 mg daily
- Best from food sources: dairy, leafy greens, fortified foods
- Supplements if diet falls short
- Take in divided doses (500-600 mg at a time)

### Vitamin D

- Adults over 50: 800-1,000 IU daily (some need more)
- Helps your body absorb calcium
- Sources: sunlight, fatty fish, fortified foods, supplements
- Your doctor may check your blood level

### Exercise

Weight-bearing exercises:

- Walking, jogging, dancing, stair climbing

Strength training:

- Lifting weights, resistance bands, body weight exercises

Balance exercises:

- Tai chi, yoga, standing on one foot

### Lifestyle Changes

- Don't smoke - smoking weakens bones
- Limit alcohol to no more than 2 drinks per day
- Maintain a healthy weight
- Eat a balanced diet with protein

#### References:

1. National Osteoporosis Foundation. "Nutrition and Exercise." [nof.org](http://nof.org).

# PREVENTING FALLS

Preventing falls is just as important as treating osteoporosis:

## Make Your Home Safer

- Remove throw rugs or secure with non-slip backing
- Keep floors clear of clutter and cords
- Add grab bars in bathroom near toilet and shower
- Use non-slip mats in bathtub and shower
- Improve lighting, especially on stairs
- Add handrails on both sides of stairs
- Keep items you use often within easy reach

## Take Care of Yourself

- Get regular eye exams
- Review medications with your doctor (some cause dizziness)
- Get up slowly from sitting or lying down
- Wear sturdy, low-heeled shoes with non-slip soles
- Use a cane or walker if needed
- Avoid walking in socks or slippery footwear

## Build Strength and Balance

- Regular exercise improves balance and reduces falls
- Tai chi is especially effective
- Strengthen leg muscles
- Consider physical therapy

## Be Careful Outside

- Watch for wet or icy surfaces
- Use handrails
- Don't rush

References:

1. CDC. "Falls Prevention." [cdc.gov/falls](https://www.cdc.gov/falls).

## TIPS FOR TAKING YOUR MEDICATION



### DO:

- Take first thing in the morning on an empty stomach
- Swallow whole with a full glass (8 oz) of plain water
- Stay upright (sitting or standing) for 30-60 minutes after
- Wait 30-60 minutes before eating, drinking, or other medications

#### FOR PROLIA (Denosumab)

- Given as injection by healthcare provider every 6 months
- DO NOT miss or delay doses
- Stopping can cause rapid bone loss and fractures

#### FOR FORTEO/TYMLOS (Teriparatide/Abaloparatide)

- Self-inject daily in thigh or abdomen
- Store in refrigerator
- Rotate injection sites
- Limited to 2 years of use

#### FOR ALL OSTEOPOROSIS MEDICATIONS

- Take calcium and vitamin D as recommended
- Keep follow-up appointments
- Report dental problems (rare jaw issue with some medications)



### DON'T:

- Take with coffee, juice, or mineral water
- Lie down after taking
- Chew or crush the tablet
- Take at bedtime

## WHEN TO CALL YOUR DOCTOR

### CALL 911 OR GO TO THE EMERGENCY ROOM IF:

- You fall and can't get up
- Severe pain after a fall
- Unable to move arm or leg after injury
- Hip pain after a fall (even if you can walk)
- Sudden severe back pain



### CALL YOUR DOCTOR'S OFFICE IF:

- New or worsening back pain
- Loss of height
- Changes in posture
- Pain in hip or thigh (especially with bisphosphonates)
- Jaw pain or dental problems
- Difficulty swallowing or chest pain after taking medication
- Side effects from medication
- You need dental surgery or tooth extraction

#### Before Any Dental Procedure

Tell your dentist you take osteoporosis medication. Some medications require special precautions before dental surgery.

#### Don't Miss Your Prolia Dose!

If you're on Prolia (denosumab), missing or delaying doses can lead to rapid bone loss and fractures. Call if you can't make your appointment.

*Any fracture after age 50 should be evaluated for osteoporosis!*

# GLOSSARY

BISPHOSPHONATE	Medication that slows bone breakdown
BONE DENSITY	How solid and strong your bones are
DXA/DEXA	Bone density scan using low-dose X-rays
FRACTURE	A broken bone
FRAGILITY FRACTURE	A fracture from low-impact activity
KYPHOSIS	Curved upper back ("dowager's hump")
OSTEOBLAST	Cell that builds new bone
OSTEOCLAST	Cell that breaks down old bone
OSTEOPENIA	Low bone mass, not yet osteoporosis
OSTEOPOROSIS	Disease causing weak, brittle bones
T-SCORE	Number comparing your bone density to a healthy young adult
VERTEBRA	One of the bones that make up the spine

## RESOURCES

### **Learn More:**

- Bone Health & Osteoporosis Foundation: [bonehealthandosteoporosis.org](http://bonehealthandosteoporosis.org) (formerly NOF)
- American Bone Health: [americanbonehealth.org](http://americanbonehealth.org)
- National Institute of Arthritis and Musculoskeletal and Skin Diseases: [niams.nih.gov](http://niams.nih.gov)
- International Osteoporosis Foundation: [osteoporosis.foundation](http://osteoporosis.foundation)
- CDC - Falls Prevention: [cdc.gov/falls](http://cdc.gov/falls)
- Mayo Clinic - Osteoporosis: [mayoclinic.org](http://mayoclinic.org)
- MedlinePlus - Osteoporosis: [medlineplus.gov](http://medlineplus.gov)

### **FRAX Fracture Risk Assessment Tool:**

- [sheffield.ac.uk/FRAX](http://sheffield.ac.uk/FRAX)



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