For More Information
Visit www.Fit2-T.org

Acknowledgements
Members of the Fit to a T Task Force: Anita Bemis-Dougherty PT, DPT, MAS; Susan Bukata, MD; Timothy L. Kaufman, PT, PhD; Barbara A. Macikas; Edward Puzas, PhD; Kris Todd, MSN, FNP, ONC, CCD; Kimberly Templeton, MD (Chair).


NIH Osteoporosis and Related Bone Diseases, National Resource Center www.osteo.org


Understanding Osteoporosis, PowerPoint Presentation, Kimberly Templeton, MD, associate professor of orthopaedic surgery, University of Kansas Medical Center

The United States Bone and Joint Initiative (USBJI) thanks the patients who kindly participated in this booklet with their stories. The patients, for privacy reasons, are only identified by their first names. USBJI thanks program partners the American Association of Occupational Health Nurses, American Osteopathic Academy of Orthopedics, American Physical Therapy Association, Business and Professional Women/USA, International Society for Clinical Densitometry, National Association of Commissions for Women, National Association of Orthopaedic Nurses, National Network of Libraries of Medicine (www.nnlm.gov), Public Library Association (www.pla.org).

The USBJI is a multi-disciplinary initiative concerned with raising awareness of musculoskeletal conditions, improving education about these conditions, their prevention and treatment, and increasing research. It is the U.S. National Action Network of the worldwide Bone and Joint Decade.

Phone: 847.430.5054 / 5052
Email: usbji@usbji.org
Websites: www.usbji.org and www.fit2-t.org

© 2012 United States Bone and Joint Initiative, NFP. All rights reserved.
Fit to a T and Fit to a T logo are trademarks of the United States Bone and Joint Initiative, NFP.
Are you Fit to a T?

Do you know your...

Blood pressure?
Cholesterol level?
Weight?
T-score?

That's right, T-score. If you had to think twice about what a T-score is — and no, it's not a golf term — chances are you probably don't know what a bone mineral density (BMD) level is, or you haven't been tested. Don't worry, you're not alone.

Bones. Bone mineral density. T-score. Yes, you should add those to that list of health factors you need to be concerned about so that you can enjoy lifelong health and an active lifestyle.

If you want to shop ‘til you drop, golf ‘til your legs ache and dance ‘til you’re 84 — knowing that your bones won’t let you down — here’s what you need to know.

Until a few years ago, many conditions — such as osteoporosis — were considered “old people’s” diseases. Today we know differently. Steps to improve bone health start at an early age. Weak bones can affect individuals of all ages.

The T-score reveals whether bones are weak or strong, and what the chances are for breaking one of them. If you thought brittle bones are a natural part of aging, think again.

Knowing what a T-score is and what “bone health” means are important first steps. If you or your health care professional have concerns about your bone health, a T-score will help you learn how strong your bones are and whether you need to take action. How do you find out your T-score? A simple, painless BMD test — which takes less than 20 minutes — will provide the answer.

So let's get started. This booklet is part of an educational program, sponsored by the U.S. Bone and Joint Initiative, to help you learn more about your bone health and the early detection, diagnosis, treatment, and prevention of osteoporosis.

Why Should You Be Concerned?

We want you to be Fit to a T™ so that you can enjoy good bone health.

Whether you are in your 20s, 40s or 70s, it’s not too early or too late to make changes in your diet, exercise program, and lifestyle to strengthen your bones.

If Americans don’t take action, by the year 2020, half of all persons older than age 50 will be at risk for fractures related to osteoporosis and low bone mass, according to the U.S. Surgeon General’s Report on Bone Health and Osteoporosis.

One common myth is that osteoporosis only happens to Caucasian women. The fact is that it affects both men and women of all races. Another myth is that only seniors have brittle bones that break. Although weaker bones are more common in older people, certain factors that lead to weaker bones are important at all ages. And even younger people can suffer from broken bones related to osteoporosis.

The truth is that osteoporosis and other bone diseases can lead to a poor quality of life — causing pain, loss of mobility and independence, and even death.

Here is the good news.

By learning more about osteoporosis, focusing on prevention and taking action, you can alter the course of the disease. Three things that you can do to improve your bone health and make your bones stronger are to take in enough calcium and vitamin D and get enough physical activity every day.

With that in mind, Americans can have strong bones and live healthy, independent and fulfilling lives — and be Fit to a T.

Here are four stories of how osteoporosis impacts lives.

When Osteoporosis Strikes at an Early Age

Susan's Story
Diagnosed: At age 46
Condition: Susan has osteoporosis of the spine, right and left hip.
Advice: “The bone density test is the easiest test you'll ever have. You lie down and it can be done in minutes. It should be done by everyone.”
What She Says: “People are surprised that I have osteoporosis. Everyone thinks it is a little old lady's disease.”

A Look at Susan — “I never smoked, my drinking is limited and overall I am healthy,” said Susan, referring to the risk factors for the disease. However, from about age 24, Susan experienced problems with dairy products and couldn't tolerate them. She was at risk because of her low-calcium diet. Her mother also has osteoporosis, so that made Susan even more prone.

Susan knows the importance of talking about osteoporosis with friends and family members, and she knows how a good fitness program can help rebuild bones and she exercises regularly. “These are the cards you're dealt,” said Susan, who has a positive attitude. “I feel lucky to live in this day and that there are medicines to help improve osteoporosis. Ten years ago they didn’t have some of these medicines.”
The Risk Factors

Smoking increases your risk of having osteoporosis as it damages bone cells and prevents new bone growth. More than 2 to 3 ounces a day of alcohol may damage your bones — putting those who consume larger amounts of alcohol at risk.

Risk Factors Associated with a Low Bone Mass: People with eating disorders, especially anorexia, are at risk of developing osteoporosis. Although your bones get stronger with exercise, you need to make sure you are eating enough calcium and vitamin D to help build bones. It is not evidence that a diet that lowers the acid levels in your body (called an “alkaline diet”) improves your bone health or lessens your risk of breaking a bone.

Early Menopause and the Link to Osteoporosis

Pam's Story

Diagnosed: At age 44

Current Condition: Pam has osteoporosis, diagnosed after she had broken several bones with minimal trauma. She knows about trauma: she broke several bones with minimal trauma. She has been living with osteoporosis for about 20 years.

Advice: "I'm not sure what caused my osteoporosis — there are probably a lot of factors. My mother had been diagnosed with the condition. Also, I was limited in how much weight bearing activity I could do for quite a while after my motor vehicle collision; my diet when I was younger was also not very good. There are some things out of your control regarding the development of osteoporosis; however, I know you can do things to keep it in check, and I am doing everything I possibly can so I can continue to do the things in life I want to do."

What She Says: "It was devastating to learn that a woman of my age would have such a low bone density. I started working with a trainer twice a week using weights to increase my bone density. To this day I continue to exercise, lift the weights, watch my diet, and stay informed about the advancements and treatments for osteoporosis."

A Look at Pam — Thirty years ago Pam was in a serious automobile accident. Nearly every bone had been broken, including both legs and spine. After several surgeries and months of intensive physical therapy, she was able to walk again and slowly return to her job as a Flight Attendant for a major airline. Over the last several years she has had numerous subsequent surgeries due to the damage from the accident and joint deterioration from posttraumatic arthritis.

The Benefits of Exercising

• Increased bone mass and strength
• Improved balance and better posture
• Improved cardiovascular fitness
• Increased flexibility of soft tissues and joints

Other Diet Tips

You need to eat enough calcium and protein to give your bone the ability to repair itself and remain healthy. People with eating disorders, especially anorexia, are at risk of developing osteoporosis. Although your bones get stronger with exercise, you need to make sure you are eating enough calcium and vitamin D to help build bones. It is not evidence that a diet that lowers the acid levels in your body (called an “alkaline diet”) improves your bone health or lessens your risk of breaking a bone.

How Do You Build Strong Bones?

Daily physical activity and a diet with enough in calcium and vitamin D can help prevent osteoporosis, according to the U.S. Surgeon General's Report.

Let's Get Physical

Building strong bones begins with daily exercise of at least 60 minutes for children and 30 minutes for adults. Children should know that building bone density in youth is an investment in the future. The best types of exercises for healthy bones are weight-bearing and strength-building activities. Jogging, tennis and walking are types of weight-bearing activities. They are important because they force muscles and bones to work against gravity and they put stress on the limbs. Strength-building exercises — which lead to stronger muscles and bone — include weight lifting, calisthenics and resistance machines. Exercises, such as Tai Chi, are good because they can help improve your balance, and decrease your risk of falling.

Before you start an exercise program, and especially if you have osteoporosis, check in first with your physician or other healthcare professional. Individuals with low bone mass may need to skip certain exercises to avoid medical problems, such as breaking a bone.

Your Body Needs Calcium

Calcium is a building block of bone and is key to having strong bones. Based upon your age, your body needs different amounts of calcium.

• Children and young adults generally need more calcium because their bodies are developing. Young adults between ages 9 and 18 need more calcium than any other age group — 1,300 milligrams per day.

• Men and women over age 50 and postmenopausal women also need a higher intake of calcium. They need about 1,200 to 1,500 mg of calcium daily.

Dairy products and milk are high in calcium; non-dairy foods such as leafy green vegetables, soybeans and salmon also contain calcium but in a lesser amount. If you have problems digesting lactose, which is in dairy products, you may need to take a calcium supplement. Talk with your physician or other healthcare professional before starting a supplement, and about the appropriate amount for you.

Don’t Forget the Vitamin D

Individuals need vitamin D to help their bodies absorb calcium from the gastrointestinal tract and to keep bones strong and healthy. The older you become, the more of this vitamin D you need. Where does vitamin D come from? The vitamin can be synthesized in skin from exposure to the sun or ingested in foods such as fortified dairy products, egg yolks, fish (i.e., salmon, mackerel and tuna), liver or in supplements. Consult your physician or other healthcare professional for the appropriate amount for you.

Warning Signs

A Broken Bone: A broken 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 the bones in your back become so weak that they 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.”

Warning Signs

A Broken Bone: A broken 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 the bones in your back become so weak that they 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.”

How Do You Build Strong Bones?

Daily physical activity and a diet with enough in calcium and vitamin D can help prevent osteoporosis, according to the U.S. Surgeon General's Report.

Let's Get Physical

Building strong bones begins with daily exercise of at least 60 minutes for children and 30 minutes for adults. Children should know that building bone density in youth is an investment in the future. The best types of exercises for healthy bones are weight-bearing and strength-building activities. Jogging, tennis and walking are types of weight-bearing activities. They are important because they force muscles and bones to work against gravity and they put stress on the limbs. Strength-building exercises — which lead to stronger muscles and bone — include weight lifting, calisthenics and resistance machines. Exercises, such as Tai Chi, are good because they can help improve your balance, and decrease your risk of falling.

Before you start an exercise program, and especially if you have osteoporosis, check in first with your physician or other healthcare professional. Individuals with low bone mass may need to skip certain exercises to avoid medical problems, such as breaking a bone.

Your Body Needs Calcium

Calcium is a building block of bone and is key to having strong bones. Based upon your age, your body needs different amounts of calcium.

• Children and young adults generally need more calcium because their bodies are developing. Young adults between ages 9 and 18 need more calcium than any other age group — 1,300 milligrams per day.

• Men and women over age 50 and postmenopausal women also need a higher intake of calcium. They need about 1,200 to 1,500 mg of calcium daily.

Dairy products and milk are high in calcium; non-dairy foods such as leafy green vegetables, soybeans and salmon also contain calcium but in a lesser amount. If you have problems digesting lactose, which is in dairy products, you may need to take a calcium supplement. Talk with your physician or other healthcare professional before starting a supplement, and about the appropriate amount for you.

Don’t Forget the Vitamin D

Individuals need vitamin D to help their bodies absorb calcium from the gastrointestinal tract and to keep bones strong and healthy. The older you become, the more of this vitamin D you need. Where does vitamin D come from? The vitamin can be synthesized in skin from exposure to the sun or ingested in foods such as fortified dairy products, egg yolks, fish (i.e., salmon, mackerel and tuna), liver or in supplements. Consult your physician or other healthcare professional for the appropriate amount for you.
Once you have a scan, what does the result mean? With the DXA scan, the amount of bone you have (your “bone density”) is measured. This is a non-invasive (does not penetrate the body) and safe, causes no pain, and is performed with low levels of radiation — less than from a digital clock X-ray. The DXA measures your BMD at the spine and hip, and occasionally at other locations, and provides the T-scores.

The test will help predict your chances of breaking a bone and confirm that you have osteoporosis after a fracture. Over time, the test will analyze your rate of bone loss and evaluate whether treatment for osteoporosis has been effective.

Knowing the T-score
Once you have a scan, what does the result mean? With the DXA scan, the amount of bone you have (your “bone density”) is measured. Your healthcare professional will give your test results in a T-score. The T-score is a very important measurement because it helps identify people at highest risk before they get a fracture. As defined by the World Health Organization, a normal T-score ranges from +1 to -1. Osteopenia is defined as -1 to -2.5. Osteoporosis is defined as greater than -2.5. The lower your T-score, the higher your risk of fracture. However, you can still have normal bone density and be defined as “osteopenia” and still be at risk of having a broken bone because of other risk factors.

How Do You Treat Osteoporosis?
If you have low bone mass but no fractures, you and your healthcare professional will put together a treatment plan to stop further bone loss and prevent fractures. If you have had one or more fractures due to osteoporosis, your physician or healthcare professional will work with you to prevent further breaks, reduce pain, improve your bone health, keep you active and enhance your quality of life.

The Fight Against Frailty Fractures

Ellen’s Story
Diagnosed: At age 52

Current Condition: Ellen has osteoporosis of the hip and spine and arthritis. She has suffered multiple fractures of neck, hip and shoulder.

Treatment: She has taken medication for osteoporosis for more than 10 years. However, she had to slow down her daily work as a hospital physical therapist and was having severe back pain.

Advice: “I feel safe not being able to lift anything. One didn’t know (back then) that exercise had to be weight-bearing. Younger people should lift weights.”

What She Says: “My bone density is so poor, I have a lifelong danger of non-traumatic fractures.”

A Look at Ellen — For 45 years, Ellen has lived with osteoporosis. At age 52, she was a hospital physical therapist and was having severe back pain. An x-ray revealed she had arthritis and osteoporosis.

“Osteoporosis has affected my life quite a bit,” said Ellen, who retired at age 59 because of arthritis of the back and knees. “Until the first two fractures — I always was quite active.”

About 30 years ago, Ellen suffered a compression fracture of a neck vertebrae while sleeping. About 23 years ago, she slipped on a wet kitchen floor and had a spinal compression fracture. Six weeks after that, she suffered yet another compression fracture while walking. Other breaks included hip and shoulder fractures from falls. She admits she has fallen many times. However, she can still have normal bone density and be defined as “osteopenia” and still be at risk of having a broken bone because of other risk factors.

When Men Have Poor Bone Health

Steve’s Story
Diagnosed: At age 42

Current Condition: Steve has osteoporosis of the spine.

Treatment: Steve was placed on therapy with an oral bisphosphonate. His Vitamin D was repleted with high dose Ergocalciferol and then switched over to Cholecalciferol for maintenance. He was also placed on a calcium supplement, and the doctor recommended he start a more regular weight-bearing exercise program. He stayed on the bisphosphonate for 4 years until his DXA showed stabilization and he now just takes Calcium and Vitamin D supplements daily. Weight bearing exercise continue to be part of his regular routine.

What He Says: “Because I maintained a healthy and active lifestyle which was required of my occupation as a Police Officer, it was distressing to me to find out I could easily fracture a bone with just a minor injury especially in my line of work. I had always connected fragile bone disease with elderly women.”

A Look at Steve — Steve’s wife is a Nurse Practitioner in an Osteoporosis Center and both of them were taken by surprise when the results of a DXA scan he took one day, purely out of interest in the DXA machine in the center where his wife works, demonstrated osteoporosis. His internist was also surprised. Steve never had a fracture. At that time Steve was working in law enforcement as a Police sergeant. He was physically active and there was no reason to suspect he had osteoporosis.

It was not clear what his risks were as he had always been healthy, didn’t smoke, ate a good diet and neither of his parents had osteoporosis. The internist was unsure of why Steve had osteoporosis so made the decision to send him to an osteoporosis specialist.

The doctor reviewed his history and ordered a battery of laboratory tests to find other contributing causes. While reviewing his history he discovered that approximately 2 years earlier he was diagnosed with thyroiditis. His laboratory results also demonstrated low Vitamin D level. The doctor concluded that these two conditions caused enough bone loss to develop osteoporosis.

Steve retired from law enforcement in 2002 and now works as a Transportation Security Manager with the U.S. Department of Homeland Security.