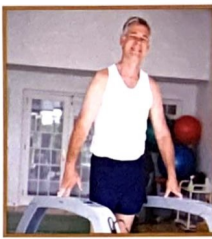


BONE HEALTH & BEYOND

Staying Healthy During ADT



Studies have shown that nutritional supplementation with calcium, vitamin D, magnesium, and other trace minerals can strengthen bones.



Androgen Deprivation Therapy (ADT), also referred to as “hormone therapy,” is sometimes used as a treatment for men with prostate cancer. Although ADT is an effective treatment for certain men with prostate cancer, it can have side effects such as osteoporosis, hot flashes, weight gain, and changes in sexual function.

Osteoporosis

Osteoporosis, a condition characterized by a decrease in bone mass and density, increases the risk of bone fractures. Although osteoporosis is most commonly seen in postmenopausal women, it is becoming more prevalent in men. Approximately 2 million men in the United States now have osteoporosis, and another 12 million are considered at risk for the disease.¹ Men treated with ADT for prostate cancer are at an even higher risk of osteoporosis. Loss of bone mineral density (BMD) is a serious consequence of ADT, and studies have shown that men undergoing hormone therapy have lower BMD, higher rates of osteoporosis, and higher rates of bone fractures than men of the same age who are not undergoing hormone therapy.² The longer you are treated with hormone therapy, the higher your risk of low BMD, osteoporosis, and fractures.^{3,4}

Hot Flashes

Hot flashes are a common symptom during ADT. Although most men do experience them, they are usually mild and may go away with time. If the hot flashes become very bothersome, you should speak to your urologist, who may recommend medications to reduce them.

Weight Gain

The large drop in androgen levels can cause some men to experience weight gain during ADT. If you notice you’ve gained a few pounds, taking action to reduce further weight gain is important for your overall health. Significant weight gain may increase your risk of heart disease and diabetes. Working with a Registered Dietitian can help you manage your weight and develop a healthy diet.

Increasing physical activity can also help you control your weight. Aerobic exercise will burn calories, and strength training can increase lean body mass (muscle), which in turn increases metabolism and allows your body to burn more calories throughout the day.

Changes in Sexual Function

The reduction in testosterone levels during ADT can cause sexual side effects such as loss of desire or erectile dysfunction. Your urologist should be able to provide you with options for dealing with these symptoms.

Maintaining Bone Health During ADT

When you start ADT, and periodically during your treatment, your urologist may suggest a special test called a Bone Densitometry Scan (DEXA), which will measure your bone mineral density (BMD).

There are things you can do to keep your bones strong and maintain BMD while undergoing hormone therapy. Studies have shown that nutritional supplementation with calcium, vitamin D, magnesium, and other trace minerals can strengthen bones. Supplementation with these nutrients, along with a healthy diet, weight-bearing

exercise such as walking and resistance training, smoking cessation, and decreased consumption of alcohol, are all important for maintaining bone strength and decreasing the risk of osteoporosis.

Nutrition and Bone Health

Calcium

Calcium is the most abundant mineral in bone. Numerous research studies have shown the importance of adequate calcium intake for maintaining bone strength and improving bone mineral density. When blood levels of calcium are low, the body “borrows” calcium from the bones, leading to bone loss. Eating a diet rich in calcium (non-fat or low-fat milk and dairy, broccoli, tofu, calcium-fortified foods) is important to maintain adequate calcium levels. For men who do not get enough calcium from their diet, adding a calcium supplement is important to ensure adequate daily intake.

Several forms of calcium are used in nutritional supplements, with calcium citrate and calcium carbonate being the most common. Calcium citrate has superior bioavailability and can be absorbed with or without food, whereas calcium carbonate requires food and stomach acid for absorption. If you are taking acid-reducing drugs such as H₂ antagonists (Pepcid®, Zantac®, Tagamet®) or Proton Pump Inhibitors (Aciphex®, Nexium®, Prevacid®, Prilosec®, Protonix®), it is important to take calcium citrate. Calcium is best absorbed when 500 mg or less is taken per dose.⁵

Vitamin D

Vitamin D is a fat-soluble vitamin that promotes normal blood levels of calcium in order to build and maintain strong bones. Without adequate vitamin D, bones become thin, brittle, or soft, increasing the risk of fractures and osteoporosis.

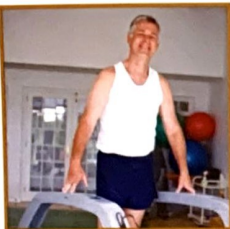
Maintaining a normal vitamin D level is important for overall health, and low blood levels have been associated with an increased risk of several cancers and other health conditions.⁶ It is difficult to maintain a normal vitamin D level from diet alone because vitamin D occurs naturally only in fatty fish (wild-caught salmon, for example). Milk is fortified with just 100 IU per cup. Our skin can make vitamin D when exposed to sunlight, although the amount varies greatly depending on age, location or latitude, time of day, smog, and use of sunscreen. It is estimated that at least one-third of Americans are vitamin D deficient due to lack of sunlight exposure, increased sunscreen use, less-efficient vitamin D production and metabolism with age and increased obesity rates.

Vitamin D is available in two forms: vitamin D₂ (ergocalciferol) and vitamin D₃ (cholecalciferol). Vitamin D₃ is considered the superior supplemental form of vitamin D because it is produced in the skin after exposure to sunlight, is metabolized more efficiently than vitamin D₂, maintains blood levels of vitamin D for a longer period of time, and is less likely to result in toxicity.⁷

Although there is not complete agreement on the optimal daily dose of vitamin D, recent research indicates that higher doses are needed for bone health. The “upper limit” for daily intake is set at 4,000 IU per day.

Magnesium

Magnesium is a mineral involved in more than 300 essential metabolic reactions in the human body. Bone is composed of approximately 1% magnesium. As the bone loses magnesium, it becomes



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more brittle and prone to fracture. Diets rich in magnesium are associated with improved bone density.⁸ The richest dietary sources of magnesium are green leafy vegetables, whole grains, and nuts.

Boron

Boron is an element that is important for bone health, primarily through its interaction with magnesium, calcium, and vitamin D. The average intake in the American diet is about 1 mg daily. Evidence suggests that an ideal intake of boron is approximately 3 mg daily. Fruits and vegetables are the most important dietary sources of boron.

Vitamin K

Vitamin K is a fat-soluble vitamin that plays an important role in blood clotting and bone mineralization. Studies show that low intakes of vitamin K are associated with low BMD and higher fracture risk.^{9, 10}

Vitamin K occurs naturally in two forms: vitamin K₁ (phyloquinone) and vitamin K₂ (menaquinone). Vitamin K₁ is synthesized by plants and is the main dietary source of vitamin K. It is found mostly in green leafy vegetables. Vitamin K₂ is synthesized by intestinal bacteria and is found in fermented soy products such as natto.

Individuals on the blood thinner Coumadin (warfarin) should consult their doctor about taking a supplement with vitamin K and should have their INR levels monitored closely. INR levels should be rechecked two weeks after starting a supplement with vitamin K. Doses of vitamin K up to 100 mcg per day, however, have not caused a significant change in Coumadin dose in studies conducted.¹¹

Strontium

Strontium is a trace mineral occurring naturally in small amounts in water, food, soil, and bones. Strontium is the active component of a prescription drug, strontium ranelate, which has been approved in Europe since 2004 to treat osteoporosis. Strontium ranelate is not available in the United States, but the mineral strontium can be found in some dietary supplements.

PRESCRIPTION MEDICATIONS FOR IMPROVING BONE HEALTH

In patients who already have low BMD or osteoporosis, certain prescription medications may be prescribed in addition to diet and lifestyle changes and nutritional supplementation. Examples of these medications are bisphosphonates, such as Fosamax®, Actonel®, and Zometa®, which have been proven to improve BMD and are considered

effective for the prevention and treatment of osteoporosis. When taking a bisphosphonate, it is important to get adequate calcium and vitamin D.

For more information,
speak to your healthcare provider.

References

1. National Osteoporosis Foundation. [http://nof.org/articles/236] Accessed 02-22-13.
2. Israeli et al. *J Urol*. 2008; 179(2):414-23.
3. Smith et al. *J Clin Oncol*. 2005; 23(31):7897-803.
4. Morote et al. *Urology*. 2007; 69(3):500-4.
5. Harvey et al. *J Bone Miner Res*. 1988; 3(3):253-8.
6. Holick. *N Engl J Med*. 2007; 357(3):266-281.
7. Houghton and Vieth. *Am J Clin Nutr*. 2006; 84(4):694-7.
8. Tucker et al. *Am J Clin Nutr*. 1999; 69(4):727-36.
9. Macdonald et al. *Am J Clin Nutr*. 2008; 87(5):1513-20.
10. Booth et al. *Am J Clin Nutr*. 2000; 71(5):1201-8.
11. Schurgers et al. *Blood*. 2004; 104(9):2682-9.
12. Segal et al. *J Clin Oncol*. 2003; 21(9):1653-9.

Regular Exercise for Your Health

Some of the possible side effects associated with ADT, such as fatigue, weight gain, and loss of muscle, can be minimized by regular weight-bearing and resistance exercise. Weight-bearing exercises include walking, jogging, stair climbing, aerobics, and dancing. These exercises require muscles to work against gravity, and therefore apply stress to the bone. Research shows that when you engage in exercise that stresses the bone, it becomes stronger and denser. Weight-bearing exercise stimulates the growth of new bone. Thirty minutes of weight-bearing aerobic exercise (such as walking) on most days of the week can also improve heart health, circulation, coordination, balance, and strength.

Resistance training, or weight lifting, has a significant bone-building effect. Increasing muscle strength causes the muscles to pull harder on the bone, which helps build bone mass. A study conducted in men undergoing ADT for prostate cancer showed that a strength training program decreased fatigue, improved health-related quality of life, and increased upper and lower body muscle strength.¹²

Stretching is also an important component of any exercise program. Stretching improves flexibility, increases joint mobility, and may decrease the risk of injury. Stretches should be performed after muscles are warmed up, such as after your exercise session or after 10 minutes of easy activity.

Remember to check with your physician before beginning an exercise program.

THE MAN PLANTM

Take on life, **with a plan.**



Get moving. Get stronger. Get started now.



What is The Man Plan™?

The Man Plan™ is a 12-week health and wellness program that has been specially created for men living with prostate cancer to help you take a more active role in your health. The program consists of three levels of resistance exercises: Starter, Intermediate, and Advanced. Each level consists of a warm-up, a set of exercises, and cool-down stretches, all guided by a certified Exercise Physiologist.

How does it work?

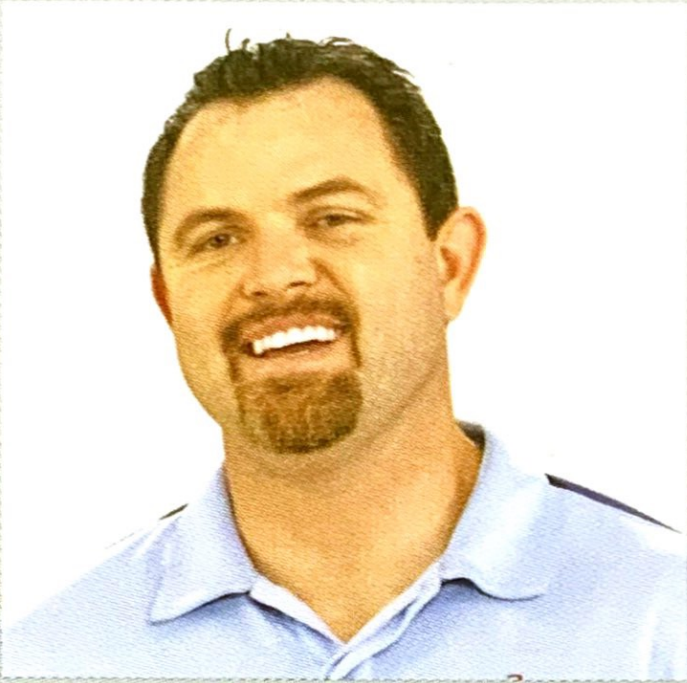
Once you complete your enrollment, you can access and view The Man Plan exercises online at your members-only portal, via a DVD, or in your print exercise manual. Beginning at the Starter level, you'll be led through a series of exercises and stretches designed to help you strengthen your muscles and improve your balance. Throughout each level, you'll be able to track your progress and share your reports with your doctor.



Here's what you'll get as part of The Man Plan™

- 3-level Exercise Program with step-by-step video instructions from Certified Exercise Physiologist Patrick Troumbley
- Complimentary resistance bands for each level (Starter, Intermediate, Advanced)
- Access to your personal online portal
- Support calls from The Man Plan representatives throughout your program
- Program updates and text reminders
- Supporters welcome! Program for friends and family who want to stay involved

Ask your Doctor if The Man Plan program is right for you and how you can enroll. Enrollment requires a verification code.



A word from Patrick Troumbley

“When it comes to your health, what you do matters. Even small positive changes can make a difference. The Man Plan™ lets you go at your own pace to help you get into a rhythm of exercising and making smart choices in your health. It truly is life, with a plan, and a great way to take a more active role in your health.”

Patrick Troumbley

Certified Exercise Physiologist



The Man Plan is an exercise program. Please talk with your doctor to decide if this program is right for you. Always follow your doctor's advice and read the precautions included with the exercise bands before each use. Stop exercising and seek urgent medical attention if you experience health issues while exercising including any unusual pain, shortness of breath, chest pain, dizziness, or feeling faint.