

Drug treatments for Osteoporosis

(Please consult your doctor for recommendations of treatment and the possible side effects of each group of drugs)

Group	Method of administration	How It Works
Bisphosphonates	Oral (eg. Alendronate, Risedronate, Ibandronic)	Oral bisphosphonates are the most commonly prescribed medications used for the treatment of osteoporosis. Patients have to follow specific instructions on how to take their medication so as to maximize effectiveness and minimize side effects.
	Intravenous infusion (Zoledronic Acid)	This is an intravenous alternative for patients who are unable to take oral bisphosphonates.
Selective Oestrogen Receptor Modulator	Oral (Raloxifene)	This acts like oestrogen to prevent bone loss by decreasing bone resorption and increasing bone mineral density.
Parathyroid Hormone Treatment	Subcutaneous injection (Teriparatide)	This is given by subcutaneous injection daily and can increase bone mineral density, bone mass, and bone strength, in patients who have failed bisphosphonates.
Monoclonal Antibody	Subcutaneous injection (Denosumab)	This is a monoclonal antibody which reduces bone resorption and increases bone mass. It is only administered subcutaneously twice a year.



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Osteoporosis



Singapore General Hospital
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What is Osteoporosis?

It is a disease that causes the bones to become weak, brittle and prone to fracture. It can affect men and women. As you age, your bones become more porous and thin and are more likely to fracture when you fall or injure yourself.

Nevertheless, osteoporosis is preventable and treatable. The key to success is building a strong skeleton when you are young which would help decrease the rate of bone loss as you age. After the age of 30, your body starts to lose bone density. Women are particularly susceptible because bone loss becomes more rapid for several years following the menopause. Having osteoporosis does not mean your bones will break (fracture), it just means you have a 'greater risk of fracture'. Even if you already have osteoporosis, good nutrition, plenty of exercise and taking prescribed medications can slow the progression.

Two common forms of osteoporosis

1. Primary osteoporosis
2. Secondary osteoporosis

Primary forms of osteoporosis are postmenopausal and age-related, respectively.

Postmenopausal osteoporosis: this happens during or after menopause as the level of the bone-building hormone oestrogen decline.

Age-related osteoporosis: the rate of bone loss is between 0.4 to 2 percent of your bone mass each year up to the age of 80. This form of osteoporosis usually starts later than the postmenopausal form and bone loss occurs much more slowly.

Secondary forms are often caused by other diseases or use of certain medications.

Risk factors

- Sex, age and race
- Body size – low body mass index (BMI)
- Early menopause
- Childbearing
- Medications – eg. steroids, anti-epileptic drug
- Hormone related disorder such as thyroid disease, reduced amount of sex hormones, adrenal glands disorder
- Medical conditions such as rheumatoid arthritis, disorders of the intestinal tract
- Prolonged bed rest and lack of exercise
- Lack of calcium and vitamin D in diet
- Excessive weight loss/dieting
- Smoking and high alcohol intake

How to detect osteoporosis

Osteoporosis can be detected based on your Bone Mineral Density. Your doctor may need to monitor your bone density scan results at regular intervals so that they can compare changes in bone density and to determine how your bone density is responding to treatment.

Preventing and treating osteoporosis

A successful action plan to prevent or treat osteoporosis involves several elements that contribute to overall bone health.

These elements include:

- Adequate intake of calcium and vitamin D
- Adequate low impact weight-bearing activities eg. jogging, walking, water aerobics, light gardening, treadmill walking for 2 – 3 times a week, at least to accumulate 30 minutes each time
- Adequate protein intake may have a protective effect on your bone structure
- Avoid smoking
- Avoid excessive intake of alcohol
- Avoid very high fibre diets
- Avoid high sodium intake
- Avoid high caffeine intake

Calcium in your diet

Calcium helps in the production of strong bones. Vitamin D helps calcium to be easily absorbed into the bones. Therefore, it is important to know which kinds of food are rich in calcium and Vitamin D. The recommended daily intake of dietary calcium is 1000mg to 1200mg, and for Vitamin D is 600(IU) to 800(IU). The best way to obtain enough Vitamin D is to have at least 30 minutes of sunshine a day. If sun exposure is not advisable because of medical reasons, Vitamin D can also be obtained in food like egg yolk, cod liver oil, oily fish such as herrings and sardines.



Choose several of the calcium rich food listed below everyday to keep your bones healthy and strong:

Food	Amount	Calcium Content (mg)
Dairy		
Milk, fortified	1 cup	600
Yogurt, plain, low fat	1 cup	485
Milk, whole	1 cup	300
Milk, low fat	1 cup	300
Milk, skim	1 cup	300
Cottage cheese, regular	1 cup	135
Cottage cheese, low-fat	1 cup	150
Soy milk, calcium fortified	1 cup	250
Fish and shellfish		
Sardines, canned with bones	3 ounces	325
Fruit		
Orange juice, calcium fortified	1 cup	300
Vegetables		
Spinach	½ cup	120
Mustard green	½ cup	115
Tofu	½ cup	130
Kidney beans	½ cup	116

Calcium supplement

If you are not getting enough calcium in your diet, you may need a calcium supplement. When you look for a calcium supplement, be sure the number of milligrams on the label refers to the amount of *elemental calcium, and not to the strength of each tablet. The recommended daily amount of calcium is given in terms of elemental calcium. **Elemental calcium is the actual amount of calcium that is available for your body to absorb.*

Tips on getting the most out of calcium supplements

- Read package labels carefully. Pay attention to the amount of elemental calcium per serving size. For example, 800mg of elemental calcium is available in each serving size and each serving size may consist of 4 tablets.
- Take calcium supplements with meals as this helps with absorption.
- Calcium supplements may cause gas, bloating and constipation in some people. To avoid such side effects, drink plenty of fluids, exercise and eat plenty of vegetables and fruits.
- Please check with your doctor for recommendations of calcium supplements when in doubt.