Good calcium nutrition is an essential part of osteoporosis prevention.

Calcium is crucial to maintain life. Just about every cell in the body, including those in the heart, nerves and muscles, relies on calcium to function properly. Bones require calcium to maintain their strength.

In the body, calcium is found in three places:
- in the skeleton and teeth,
- in the cells, and
- in the blood.

Because calcium is so important, the body has a carefully regulated system to ensure that a good supply is always - and immediately - available. The body does this in three ways:
- It absorbs calcium directly from the food we eat.
- It takes calcium from our bones if there is not enough available. When this happens, the bones become less dense and more fragile.
- It slows down the amount of calcium that leaves the body in the urine by returning some to the blood stream where it remains available to organs and cells.

The main goal of good calcium nutrition is to maintain an adequate supply so that our bodies do not have to dip into our only calcium reservoir - our bones.

The Role of Calcium in Building Stronger Bones
In childhood, calcium is necessary to grow a healthy skeleton to support a growing body. By age 20 in men and age 16 in women, bones typically stop growing in length and we are almost at our peak bone mass. The density of our bones at this point depends a lot upon our calcium intake as children and teenagers. The greater this peak bone mass, the less likely our bones are to become porous and fragile later in life. Bone is living tissue, constantly renewing itself. Although bone is strong and relatively flexible, everyday wear and tear causes tiny structural defects, much like those that occur in the foundations of a building over time. In our bodies, there are two groups of specialized cells that perform the work of a “maintenance crew.” Osteoclasts excavate any areas of crumbling or weakened bone and then osteoblasts fill in the crevices with material that calcifies to form new bone. This two-part process is called bone remodeling, and is completed every three to four months in a healthy young adult.

As we age, the two groups of cells that form the maintenance crew become less efficient in working together - the osteoclasts remove old bone faster than the osteoblasts are able to rebuild it. In addition, calcium, like many nutrients, is absorbed less effectively as we age. In people who have relatively healthy

<table>
<thead>
<tr>
<th>Age</th>
<th>Daily Calcium Requirement</th>
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<tbody>
<tr>
<td>4 to 8</td>
<td>800 mg</td>
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<tr>
<td>9 to 18</td>
<td>1300 mg</td>
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<td>19 to 50</td>
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<td>50+</td>
<td>1500 mg</td>
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<tr>
<td>pregnant or lactating women 18+</td>
<td>1000 mg</td>
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HOW TO MAXIMIZE YOUR CALCIUM INTAKE THROUGH DIET

MAKE SURE THAT YOU ARE GETTING AN ADEQUATE AMOUNT OF CALCIUM EVERY DAY

Consult a reliable food chart - like the one on the right - which shows the calcium content of specific foods. Calculate your daily calcium intake and see if you are achieving the levels recommended by Osteoporosis Canada.

EAT FOODS THAT CONTAIN CALCIUM THAT IS EASILY ABSORBED

Dairy products such as milk, cheese and yogurt are excellent sources of calcium because they contain high amounts of calcium that are easily absorbed by the body. Skim milk products provide as much calcium as whole milk with the added advantage of less fat and cholesterol. Some calcium-fortified soy beverages and orange juices may contain as much calcium as milk (check the labels). Vegetables also provide calcium, as do fish products containing bones (canned salmon and sardines) and meat alternatives such as lentils and beans.

PAY ATTENTION TO FOODS THAT CAUSE CALCIUM LOSS

There is evidence to suggest that calcium loss through the urine is increased by the consumption of excess salt and caffeine.

SALT (SODIUM):
Over 90% of sodium comes from food rather than from table salt. Therefore, it is advisable to keep the intake of salt and salty foods to a minimum.

CAFFEINE:
Most experts agree that two to three cups of coffee or cola a day is probably not detrimental if calcium intake is adequate. If you consume more than four cups a day, have at least one glass of milk for every cup of caffeine-containing beverage (or make your
Vitamin D: A Key Factor in Good Calcium Absorption

Vitamin D3 increases calcium absorption by as much as 30 to 80 percent. Osteoporosis Canada recommends that Canadians aged 19 to 50, including pregnant or lactating women, receive at least 400 international units (IUs) of vitamin D3 per day. Adults over 50 should receive at least 800 IUs.

Milk fortified with vitamin D3 contains 100 IUs per 250 ml glass. Foods such as margarine, eggs, chicken livers, salmon, sardines, herring, mackerel, swordfish and fish oils (halibut and cod liver oils) all contain small amounts.

Since it may be difficult to get enough vitamin D3 from food alone, you may wish to consider supplements, particularly during the winter months. Most multivitamins provide 400 IUs of vitamin D3. Some calcium supplements also contain vitamin D3.

When You Can’t Get Enough Calcium From Food

If you find it difficult to obtain the recommended amounts of calcium through diet alone, a combination of foods rich in calcium and calcium supplements is a good strategy.

Calcium supplements are tablets, capsules or liquids containing the mineral calcium from a non-food source. These sources include:

- Calcium carbonate, which can be refined from limestone, natural elements of the earth, or may come from shell sources, usually oyster. Shell sources are often described on the label as a “natural” source. Calcium carbonate from oyster shells is not “refined” and can contain variable amounts of lead.
- Chelated calcium, which refers to a special way in which calcium is chemically combined with another substance. Calcium citrate is an example of such a chelated preparation. Calcium may also be combined with other substances to form preparations such as calcium lactate or calcium gluconate.
- Powdered bone (bonemeal) or dolomite, a mineral found in rock. (Bonemeal is not recommended, as it may contain contaminants.)

As a rule, a daily multivitamin does not contain enough calcium to suffice as a supplement.

How To Choose A Supplement

There are many brands of calcium supplements available at health food stores and pharmacies. To evaluate these calcium supplements, Osteoporosis Canada suggests taking the following factors into consideration:

THE AMOUNT OF CALCIUM PER TABLET OR DOSE

The product label should state the amount of elemental calcium in each tablet, e.g., 500 mg of elemental calcium in each 1250 mg tablet of a brand of calcium carbonate supplement. The amount of elemental calcium is the figure you use to calculate your true daily intake. Products made from calcium carbonate are often recommended because they contain the highest percentage of elemental calcium per mg of calcium source.

PRICE

The most expensive preparations are not necessarily the best. Costs will vary among brand name products and similar generic supplements. Prices may also vary with the amount of elemental calcium per tablet. Compare brands and prices.

SUITABILITY OF TYPE

For some, calcium supplements may cause stomach upset, constipation or nausea. Try different brands or forms, e.g., chewable or effervescent tablets, to find a suitable product for you.

LEAD CONTENT

Calcium citrate and refined calcium carbonates have the lowest lead content.

SAFETY

Specific Canadian standards have been established for lead content, quality, and disintegration; products with D.I.N. (Drug Identification Number), N.P.N. (Natural Product Number), or G.P. (General Product) numbers have passed these tests. The initials U.S.P. (United States Pharmacopoeia) also indicate that the product adheres to specific standards established by the U.S. government.

coffee a café latté). Tea has an insignificant impact on calcium intake.

If you eat few or no dairy products, monitor your calcium intake carefully

Some people are unable or choose not to eat dairy foods. If you are one of these individuals, we strongly recommend that you educate yourself on the calcium content of other foods. Monitor your calcium intake very carefully (possibly with the help of a dietitian) and consider a calcium supplement to make sure you meet your daily requirement.
If you have any doubts, ask your pharmacist to recommend a brand.

**TABLET SIZE**

Some calcium tablets are very large and may be difficult to swallow. If this is a problem for you and you can’t see the tablet through the bottle, ask your pharmacist or sales person about tablet size. You may wish to inquire about chewable or effervescent tablets.

**HOW TO TAKE A SUPPLEMENT**

As calcium is absorbed into the blood stream through the intestine, many of the considerations about taking high concentrations of calcium have to do with maximizing the way it is absorbed. Therefore:

1. Take calcium carbonate with food or immediately after eating. It is absorbed more effectively when there is food in the stomach. Calcium citrate, calcium lactate and calcium gluconate are well absorbed at any time.

2. Take calcium with plenty of water.

3. Take no more than 500 mg of elemental calcium at one time.

4. Antacids are an acceptable source of calcium. The calcium in these products is calcium carbonate and should be taken at mealtime to facilitate absorption.

We’re here to help you!

Osteoporosis Canada is the only national organization serving people who have or are at risk for osteoporosis. To join Osteoporosis Canada, please contact us at:

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Tel: 416-696-2663
Fax: 416-696-2673
1-800-463-6842 (M-F, 10-4 EST)

The information contained in this fact sheet is not intended to replace medical advice. Readers are advised to discuss their individual circumstances with their physician.

www.osteoporosis.ca
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