National Calcium Recommendations:
An Update for Health Professionals

Background
In November 2010, the Food and Nutrition Board of the Institute of Medicine (IOM), National Academy of Sciences (NAS) updated national calcium recommendations for Americans and Canadians.[1] These recommendations reflect recent research and knowledge pertaining to calcium's effect on our health—as well as adverse effects of consuming too much calcium—and are a good reminder of the importance of consuming adequate amounts of this bone-building nutrient throughout our lifespan.

The new recommendations are based on levels needed to promote health and prevent chronic disease. This update incorporates some subtle, yet significant, changes in the recommendations for this important nutrient, including:

- Establishment of a Recommended Dietary Allowance (RDA), rather than Adequate Intake (AI) level. AIs were established previously as rougher estimates of intake requirements. The new values reflect the maturity and strength of the scientific evidence upon which the more solid RDAs are based;
- Differentiation of the needs for women in the 51 – 70-year-old age group from those of men;
- Higher recommendations for children ages 1 – 8 years;
- More specific Tolerable Upper Levels (ULs) for the various age groups.

In addition, the new reference values are based on much more information and higher-quality studies than what was available when the 1997 recommendations were developed.

2010 Calcium RDA and UL Values

Age (years)	RDA (mg/day)	UL (mg/day)
1 – 3	700	2,500
4 – 8	1,000	2,500
9 – 18	1,300	3,000
19 – 50	1,000	2,500
51 – 70 women	1,200	2,000
51 – 70 men	1,000	2,000
71+	1,200	2,000

Health benefits of calcium
There are various emerging benefits of calcium beyond bone health, the area that the IOM committee based their recommendations upon due to its scientific strength and reliability. The new research includes possible benefits of calcium in preventing colon cancer, cardiovascular disease, hypertension, diabetes, metabolic syndrome, pre-eclampsia and in weight management. Unfortunately, due to dissimilar study designs, inconsistent results and overall lack of randomized clinical trials, it is difficult to draw strong conclusions from these areas upon which to base population-wide dietary recommendations. The committee did not discount these other benefits beyond bone health; rather, it encouraged further targeted research to be integrated in the next update of calcium recommendations.

Tolerable Upper Levels
Tolerable Upper Levels (ULs) represent the maximum intake that is unlikely to pose a risk of adverse health effects in almost all healthy individuals. The committee made it clear that the UL should *not* be misunderstood as the amount people need or should consume. They also acknowledged that, as people consume more calcium-fortified foods and take calcium supplements, it is easy to inadvertently consume close to or above the UL. For example, National Health and Nutrition Examination Survey (NHANES) data indicate that approximately 5 percent of postmenopausal women exceed the UL level by 300 – 365 mg/day, when both food and supplement sources are considered.[2]

Overuse of calcium supplements—but not dietary calcium—has been linked to an increased risk for kidney stones in women.[3] Hypercalcemia—excessively high levels of calcium in the blood—has also been linked to renal insufficiency, constipation, vascular and soft-tissue calcification and high levels of calcium in the urine.[1]

Recommendations versus actual intakes

Data from NHANES show gaps in calcium intake across many ages and both genders, in comparison with recommendations. In particular, 9 of 10 teenage girls and 6 of 10 teenage boys do not achieve the recommended levels from dietary sources.[4] The pre-teen and teenage years are an especially important "window of opportunity" to bone health, as more than one-half of adult bone mass is formed during these years.[5] Supplement use can help to improve this gap, but may not be a consistent source of calcium needed across the lifespan to optimize bone health.

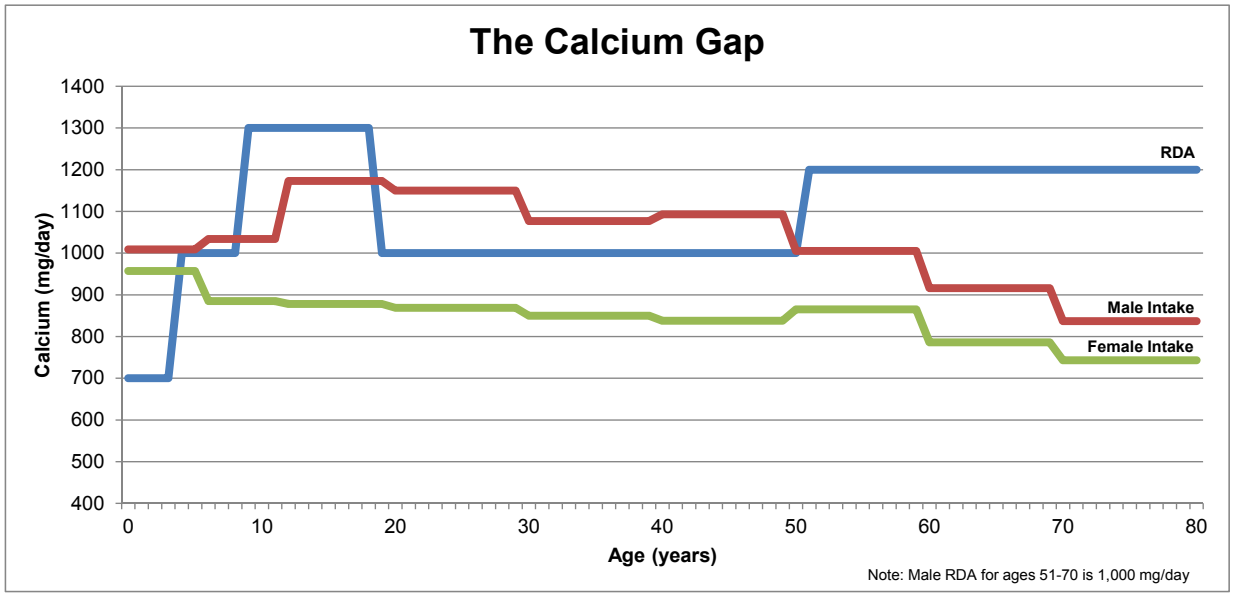
The graph below shows how current consumption levels of calcium from dietary sources lag behind the recommendations in both genders and across many age groups.[6] Filling that gap by consuming adequate food sources of calcium across the ages is critical to ensure short- and long-term health of Americans. The 2010 Dietary Guidelines, in fact, list calcium as one of four "nutrients of concern"—along with vitamin D, potassium and fiber—in the average American diet.[7]

Foods versus supplements

The IOM committee strongly encourages consumers to get nutrients from food rather than supplements to avoid excessive intake levels possible with supplementation. However, there are certain subgroups—specifically, adolescent girls and those over 70—for whom supplements may be necessary to achieve their intake goals.

Another benefit of consuming nutrients from foods rather than supplements is that foods provide intakes of beneficial nutrients and food components for which recommendations may not exist. In addition, nutrients can interact with each other positively to enhance absorption and utilization in the body—for example, vitamin D assists with calcium absorption; vitamin C enhances the absorption of iron.

Calcium supplements can also interact negatively with medications by decreasing absorption of certain antibiotics and anticonvulsants and increasing risk of hypercalcemia and urinary calcium excretion, leading to calcium depletion.[8]



High-calcium food sources

Milk and milk products are a concentrated source of well-absorbed calcium, providing approximately 72 percent of the dietary calcium in the U.S.[9] Following is a list of calcium-containing foods, serving size, and the amount of calcium per serving. Foods fortified with calcium, such as some fruit juices, cereals and soy beverages, can help to meet the recommendations. Note that absorption can vary considerably, however, significantly reducing calcium bioavailability from some vegetable sources.[10]

Food	Serving size	Calcium (mg)
Yogurt, plain, lowfat	1 cup	415
Sardines with bones	3 oz.	324
Cheddar cheese	1.5 oz.	306
Milk, fat free, reduced fat or whole	1 cup	291 - 302
Mozzarella cheese	1.5 oz.	275
Tofu, processed with calcium salt	½ cup	204
Orange juice, fortified	6 oz.	200 – 260
Spinach, cooked	½ cup	120
Kale, cooked	1 cup	94
Vanilla ice cream	½ cup	85
Soy beverage, fortified	1 cup	80 – 500
Almonds	1 oz.	75
Beans	1 cup	70
Corn tortilla, lime-processed	1 medium	42
Broccoli, raw	½ cup	21

Adapted from ref 11.

Call to action

As a health professional, you are in an ideal position to take an active role in educating your clients of their calcium needs and helping them bridge the gap between their current intake and recommendation. This is critical for clients of all ages and both genders. Addressing calcium needs will help to optimize bone health by improving deposition in adolescents and teenagers, maintaining bone density in adults and minimizing bone loss in older patients.

Focusing on food sources of calcium rather than supplementation will minimize the risk of reaching dangerously high levels, as well as allow clients to benefit from the “package of nutrients” inherent in foods. Certain individuals, however, may be good candidates for supplements if they are unable to achieve their recommended intake levels through dietary sources.

Current calcium recommendations are based on needs to optimize bone health throughout the lifespan. As research matures, calcium may also prove beneficial in preventing chronic disease such as certain cancers, cardiovascular disease, hypertension, diabetes, metabolic syndrome, and in weight-management efforts. Health professionals will need to stay abreast of this emerging research to help their clients individualize their dietary regimens to optimize their health.

References

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