Vitamin D and Disease Prevention

Why is vitamin D important for health?
Vitamin D is a hot topic in the news, thanks to reports claiming its many health benefits. There is controversy, though, over the effects of vitamin D on health other than the bones.

Doctors have long known that vitamin D helps the body absorb calcium and is vital for strong, healthy bones. In fact, a lack of vitamin D can contribute to weak bones in people who have osteoporosis. Severe vitamin D deficiency can cause rickets in children and osteomalacia (“soft” bones) in adults.

Yet, vitamin D is more than a vitamin. It really is a prohormone, a substance that the body converts to a hormone. The skin makes vitamin D after exposure to sunlight. We also absorb vitamin D from certain foods, such as dairy products and certain oily fish, such as salmon, mackerel, and sardines. Vitamin D has its effects by binding to a protein (called the vitamin D receptor). This receptor is present in nearly every cell in the body and affects many different body processes.

The problem is that many people do not make enough vitamin D by exposure to sunlight* or get enough through their diets. They may need supplements to raise their vitamin D level.

Health care providers can measure vitamin D in the body with a blood test. This screening test is for people at risk of vitamin D shortage.

What is the new thinking about vitamin D?
Some studies show that low blood levels of vitamin D may raise the risk of chronic (long-term) health problems, and that getting more vitamin D may lower those disease risks. Health problems that may be linked to low vitamin D include these, among many others:

- Some cancers
- Heart disease
- Diabetes (high blood sugar)
- Obesity
- Muscle weakness

However, it is not clear if a relationship between non-bone diseases and low vitamin D levels means that low vitamin D causes those diseases. It also is not clear if taking extra vitamin D can protect against chronic diseases.

Therefore, The Endocrine Society asked a panel of experts to prepare a Scientific Statement that would assess scientific evidence about non-skeletal effects of vitamin D. The panel reviewed published studies for some of the health problems linked to low vitamin D. This fact sheet gives an overview of their conclusions, by type of health problem.

Does low vitamin D cause diabetes and obesity?
Studies show that people who have low vitamin D levels are more likely to be obese. However, they do not show that low vitamin D causes obesity. In fact, because vitamin D can become “trapped” in body fat, obesity may cause low vitamin D.

People with low vitamin D, studies show, are likelier to have type 2 diabetes, pre-diabetes, and the metabolic syndrome. (This syndrome is a cluster of risk factors that raise the chance of developing diabetes, heart disease, and stroke.) These diseases are even more likely to affect children and teens with low vitamin D than adults.

Yet, studies have not revealed whether the health problem (such as diabetes) or the low vitamin D came first. Also, most studies have found that vitamin D supplements had no effect on blood sugar. Because these diseases are more likely in people who are obese, it may be the obesity that contributes to vitamin D deficiency.

* You should limit your exposure to sunlight to reduce the risk of skin cancer. You should also know that sunscreens interfere with your body's ability to make vitamin D.
Some studies have linked low vitamin D levels in the blood to a raised risk of cancer and dying of cancer (all types). Other studies have found that the higher the vitamin D intake from supplements, the lower the risk of certain types of cancer. These include

- Colorectal
- Breast
- Prostate

However, we do not yet know if vitamin D supplementation lowers the chance of getting cancer. To date, most studies have not had enough subjects or a long enough follow-up. Also, results have conflicted. Some studies show a benefit from vitamin D, and others find no benefit in reducing cancer risk.

Of concern is some studies suggest that high blood levels of vitamin D (40 ng/mL or above) may raise the risk of some cancers (cancer of the pancreas and esophagus).

Based on current scientific publications, the panel of experts could not answer the questions here with an absolute “yes” or “no.”

In reviewing published studies, the experts gave the most weight to the “gold standard” for most medical research: randomized clinical trials. In these human studies, researchers randomly assign subjects to one of two or more treatments, and they control for factors that could bias the results. Only randomized clinical trials can find a cause and effect. Observational studies, which simply observe what people are doing and what the outcomes are, often are larger than clinical trials. But, they can show only a relationship between a treatment (or prevention) and an outcome, not cause. For example, observational studies show that more educated people live longer, but that doesn’t mean a better education causes longer life. Instead, the opportunities that come with better education, such as jobs, health care, and income, may be more likely to lead to a longer life.
There were not enough randomized trials on this topic. More randomized studies in large numbers of people are needed before experts can conclude that vitamin D offers preventive and therapeutic benefits for a wide range of chronic non-bone diseases. At least one large randomized clinical trial has already begun to look at whether taking a high daily dose of vitamin D can lower the risk of cancer, heart disease, and stroke. Other studies are looking at whether vitamin D supplementation early in life can prevent type 1 diabetes in children.

**Should I take high-dose vitamin D to prevent chronic disease?**

The Endocrine Society has advised how much vitamin D people should get to protect their bone health. (See the Hormone Health Network’s Patient Guide to Vitamin D Deficiency.) It does not, however, recommend a high dose of vitamin D to try to prevent non-bone disease, improve quality of life, or extend life. Until more and better scientific data become available, talk to your doctor about whether to test your vitamin D level and how much vitamin D you need.