Vitamin D promotes bone health by increasing absorption of calcium and phosphorus in the intestine. It’s also important for muscles, nerves, and the immune system. Although exposure to sunlight is a ready source of vitamin D, deficiency in the U.S. is common. This newsletter focuses on two groups of people at increased risk. These are obese individuals and pregnant women.

**Vitamin D in Obesity**

Obesity means there is excess fat tissue in the body. It’s defined by a body mass index (BMI) of 30 or higher. About a third of Americans are obese.

**Obesity Lowers Vitamin D Levels**

Scientists have studied vitamin D in obese and nonobese people. In one study, they found that:

- After a dose of UV light, obese and nonobese people had an increase in the amount of vitamin D. But the increase was 57% less in the obese people.
- After an oral dose of vitamin D, the same thing happened. The blood level increased in both obese and nonobese people. But obese people had less of an increase.

So obese people had lower blood levels of vitamin D. It didn’t matter how it entered their body.

**Why Obesity Leads to Vitamin D Deficiency**

Scientists believe that fat-soluble vitamin D is efficiently stored in body fat, where it is not available for the body to use. Since obese people have more fat tissue, more of their vitamin D is stored in fat. So there is less available for use.

**Vitamin D and Pregnancy**

Many pregnant women don’t have sufficient levels of vitamin D. This is true even for those who take a prenatal vitamin. A number of studies have linked low levels of vitamin D with impaired bone development in the fetus. Some, but not all, studies have linked low levels to:

- Preeclampsia: One study found that levels <20 ng/mL were associated with a 5-fold increased risk of severe preeclampsia.
- Gestational diabetes: An association between glucose intolerance and low vitamin D levels has been seen. And some studies have found a link between low vitamin D levels and risk for gestational diabetes.

**Others Who Are at Risk**

These other conditions may also put people at risk for vitamin D deficiency:

- Having dark skin
- Being elderly
- Being housebound
- Taking certain medications
- Having a condition which limits the uptake of nutrients from the gut

**Impact of Seasons on Vitamin D**

Vitamin D levels depend on the season. This is because they depend on how much sun people get. Levels are usually lowest in February and highest in August. So people may need to take more vitamin D in the winter than in the summer.

**Impact of Skin Color on Vitamin D**

People with darker skin color make less vitamin D. This is probably because darker skin blocks some of the sun’s rays. So less vitamin D gets made. One study found very low levels of vitamin D in:

- 31% of African-Americans
- 12% of Hispanics
- 3% of Caucasians
Vitamin D
In Obesity and Pregnancy

Facts

- Low birthweight: One study found that pregnant women who were vitamin D deficient (≤12 ng/mL) had a 2.4-fold higher risk of having a low birthweight baby.  
- Primary Cesarean section: One study found that women who were vitamin D deficient (<15 ng/mL) had a 4-fold increase in the rate of this procedure.  
- Fetal lung development: Insufficient lung development may increase risk of lung infections in the newborn. In one study, vitamin D-deficient (<20 ng/mL) newborns had a 6-fold increased risk of viral lower respiratory tract infections in their first year of life.

Vitamin D Levels in Infants
During pregnancy, vitamin D crosses the placenta and is stored in the fetus. These stores are depleted by about 8 weeks of age in breastfed infants who don’t get vitamin D supplementation. After that, babies must rely on vitamin D from diet, sunlight, and supplements. Babies who get formula usually get enough vitamin D because it’s added to all formulas in the U.S. But babies who are only breastfed are at higher risk for deficiency. This is because human milk contains a very low concentration of vitamin D (approximately 20-60 IU/L). Babies need more vitamin D than that to maintain an optimal level. The American Academy of Pediatrics recommends that all infants receive 400 IU/day beginning soon after birth.

Getting Enough Vitamin D
Experts don’t agree on how much vitamin D we need to get from our diet. But they do think people who are obese need more vitamin D than those who aren’t. In fact, obese people may need 2 to 3 times more. This goes for both obese children and adults. Some experts think that pregnant women may need 2 or 3 times more too. People can talk to their doctors to find out how much they need. A doctor may want to test for vitamin D to find out how much a person has. Then he/she can offer better advice about how much the person needs to get.

Laboratory Testing for Vitamin D
Quest Diagnostics offers two methods for vitamin D testing. Both have been rigorously validated. Both are considered accurate and reliable. They are:
- An immunoassay that provides highly quantitative results. It’s suitable for most people.
- An LC/MS/MS method that is appropriate for people who have been prescribed vitamin D2. It’s also used when separate measurement of vitamin D2 and D3, in addition to total vitamin D, is required.

References