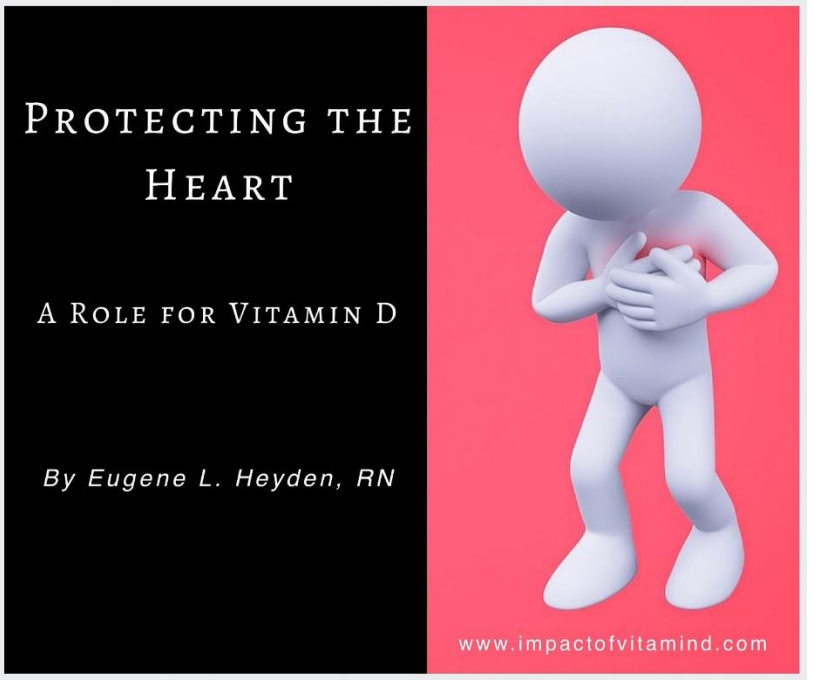

Protecting the Heart: A Role for Vitamin D

By Eugene L. Heyden, RN

Vitamin D protects against Cancer. Vitamin D protects against autoimmune disease. Vitamin D protects against Alzheimer's disease, against Parkinson's disease, and against multiple sclerosis. It protects against so many diseases. So, why would it not protect against heart disease? The answer is "it does."

> *In the Health Professionals Follow-up Study,* ***men with a high circulating level of vitamin D had half the risk of myocardial infarction*** *as men with vitamin D insufficiency.* **(Kilkkinen et al., 2009, emphasis added)**

Heart disease, more formally referred to as cardiac disease, falls under the umbrella term **cardiovascular disease** (CVD). Cardiac disease just happens to be our No. 1 killer. And this killer will destroy approximately one out of three of us living here on planet Earth (Aleksova et al., 2015). And yes, I've seen this killer in action.

In my nursing career, I have spent nearly a quarter of a century in the trenches battling this killer—taking care of acute heart attack victims, patients with various degrees of heart failure, individuals recovering from open heart surgery, and those recovering from heart transplantation. So unexpectedly, this killer preys on those who are vitamin D deficient, which is why I am writing to warn you of the danger. It is quite likely you are among those who are at great risk.

> *In the United States and Europe, > 40% of the adult population has low vitamin D levels.* **(Milazzo et al., 2017)**

Surprisingly (but not to me), one study *"found a high (96%) prevalence of vitamin D deficiency in patients with acute myocardial infarction."* (De Metrio et al, 2015) Apparently, vitamin D deficiency is something to avoid if you want to live a healthier life and a longer life, a life not inviting an early death to sweep you away.

A **myocardial infarction** (MI) is a fancy word for heart attack. A heart attack is typically caused by a blood clot that forms in a narrowing in an artery, in this case a coronary artery, one that feeds a significant portion of the heart. Given time, given circumstances, a blood clot will form in the narrowing and create a sudden blockage of blood flow, initiating the MI. Unless resolved, death of the affected portion of the heart will occur. Often the death of an entire person will occur. Nearly 50% of MI sufferers die before they arrive at the hospital to receive life-saving care—all due to a coronary artery narrowing and the formation of a silly little blood clot. One can see a narrowed coronary artery, as well as the occlusion, when **coronary angiography** is performed. So now you

know the basics as well as a medical term or two, and should readily appreciate the following:

> *In more than 3000 subjects undergoing coronary angiography, severe vitamin D deficiency (25(OH)D <10 ng/mL) had **3 to 5 times risk of dying from sudden cardiac death or heart failure** during a 7-year follow-up period compared with optimal levels of vitamin D (25(OH)D >30 ng/mL).* **(Judd and Tangpricha, 2009, emphasis added)**

Unfortunately, there are so many individuals with vitamin D deficiency, even severe vitamin D deficiency, that given enough time, the commonplace yet the unthinkable can occur. According to the Center for Disease Control and Prevention (CDC) (2015), coronary artery disease kills 370,000 Americans each year. It looks like we could substantially reduce the number, perhaps by half, simply by solving the problem of vitamin D deficiency in our population. But we're not even close to thinking about doing this. Instead, we think about other things and we allow vitamin D deficiency to persist.

At this point in our conversation I should probably tell you how vitamin D protects against heart disease.

To begin with, **vitamin D restrains both systemic and vascular inflammation, protecting against the development of vascular disease**. Conversely, *"Vitamin D deficiency stimulates systemic and vascular inflammation, enabling atherogenesis."* (Mozos and Marginean, 2015) Things just don't happen out of the blue. Apparently, inflammation occurring in coronary arteries is a pivotal step that leads to **atherogenesis**. Atherogenesis is the disease process that damages the coronary artery, allows the damaged portion to narrow, and sets the stage for coronary artery occlusion. And should an occlusion occur, the result is an MI . . . and people die. Vitamin D acts to prevent this process, at the very beginning and at several key steps along the way. But it must be in adequate supply.

In the disease process that leads to an MI, an abnormal uptake of both calcium and cholesterol progressively occurs within the wall of an injured,

diseased portion of a coronary artery. **Vitamin D acts to prevent both calcification of a coronary artery and the accumulation of cholesterol within a compromised portion of a coronary artery**. (Mozos and Marginean, 2015) Perhaps surprising to you (but not to me), cholesterol can accumulate in a coronary artery even when blood cholesterol levels are normal, as approximately 75% of heart attack victims have normal cholesterol levels (Champeau, 2015). On the other hand, studies have shown that almost everyone who has a heart attack has a low vitamin D level. So, it sounds like more attention should be paid to vitamin D levels than to cholesterol levels in our battle against coronary artery disease. And why not? Vitamin D has so much to offer!

Among other things, **vitamin D helps prevent abnormal clotting from occurring in a narrowed coronary artery**. (see Mozos and Marginean, 2015) So at the very least, vitamin D may postpone (perhaps forever) what may have become an inevitable MI. But there is more . . .

One response the heart mounts when experiencing a progressive narrowing of a coronary artery is to create what are called collaterals. A collateral is a new vessel, created by the heart to perform a little bypass operation on itself. A collateral will allow blood to flow around the narrowing in a coronary artery to supply blood to a threatened portion of the heart. A network of collateral arteries can save you in the event of a sudden coronary occlusion. Guess what? **Vitamin D stimulates the formation of collateral circulation**. It does this by stimulating growth factors and the like (Lima Jr. and Kunadian, 2015). Less collateral circulation develops in the context of vitamin D deficiency. Hence, *"vitamin D levels were found to be an independent predictor of coronary collaterals development."* (Lima Jr. and Kunadian, 2015) Which is probably why one study found, *"vitamin D deficiency was more common among patients in the poor-collateralization group compared to patients in the well-collateralization group."* (Hossein-Nezhad et al., 2015) So, it should be of no surprise that the authors reporting on this study make the following statement:

Maintaining a normal vitamin D status should be a high priority in the general population. Likewise, vitamin D supplementation may be beneficial in the prevention of CAD [coronary artery disease] in patients with an increased risk for CAD. **(Hossein-Nezhad et al., 2015)**

Since the subject was brought up, perhaps now would be a great time to discuss vitamin D supplementation. Simply put, we need to supplement because diet won't cut it. We know this because all those individuals, with those low vitamin D levels, those who have all those MI's, are eaters. Diet offered them little or no protection against vitamin D deficiency and little or no protection from coronary artery disease.

Of course, anyone can generate thousands of units of vitamin D each day by relevant sunlight exposure—but only during late-morning to mid-afternoon, and between March through September, leaving approximately 5 months of the year when no vitamin D can be made no matter how hard you try.

So, as you can see, vitamin D supplementation is clearly the answer, but not the only answer. Vitamin D testing is in order. *"Zittermann et al. found a vitamin D level of 30–35 ng/L. as the best choice for risk reduction in cardiovascular mortality."* (Mozos and Marginean, 2015) Combining testing to see where you are at, supplementing with vitamin D as indicated—and repeat testing to determine if a therapeutic goal has been achieved and is maintained—is clearly the best approach to substantially reduce your risk of drawing the attention of our No. 1 killer.

On, no! You've gone and done it. You have had an MI. Since you are reading this, it is safe to say you did not die. But be aware, those who do not die from their MI, have a list of threats lying in wait, problems also related to an individual's vitamin D status.

Vitamin D status is prognostic for major postinfarction adverse events, such as heart failure hospitalizations, recurrent acute myocardial infarction, death, or restenosis [reocclusion] after percutaneous coronary intervention. ***A significant, moderate association was found between circulating vitamin D concentration and***

> ***the risk of all-cause mortality, especially deaths due to coronary disease.*** **(Mozos and Mardinean, 2015, emphasis added)**

I think I've made things abundantly clear. Vitamin D can protect you from experiencing an MI, death from an MI, and experiencing the adverse consequences of an MI. But you can ignore all this if you want to (at your peril). Or, you can take the steps necessary to become vitamin D sufficient and a lot less invisible to our No. 1 killer.

Highly recommended

Diet Guidelines to Improving Heart Health

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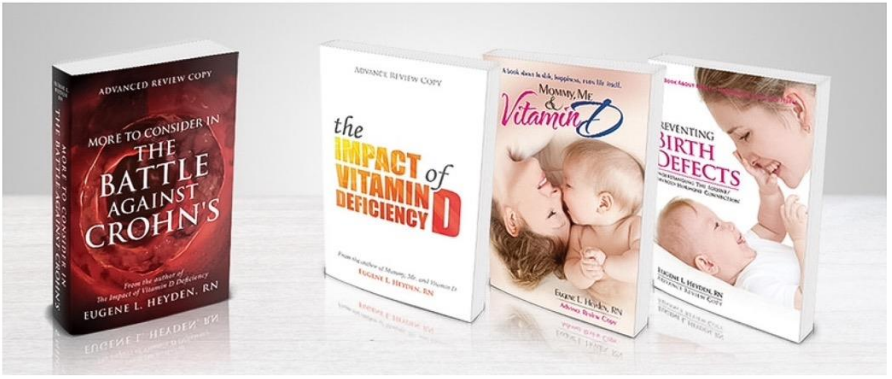

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