So Tell Me . . . What Are You Doing to Prevent Breast Cancer?

By Eugene L. Heyden, RN

This needs to end. One in eight women will deal with breast cancer at least once in their lifetime. And you never know, the incidence of breast cancer may be on the rise. As a post-surgical recovery nurse, I see it almost every day in my nursing practice. I wish so many did not have to be so brave.

In the earliest days of civilization, breast cancer was exceedingly rare. In ancient Egypt, a mummy or two may have contracted the disease (before they became mummies), but that was about it.

With the passage of time, the incidence of breast cancer steadily increased. Of course, until modern times, most people died well before their fifties and sixties, and seldom made it to their eighties or nineties. And if they did make it that far, they had to cheat by skipping their seventies altogether. But times they have changed. Thankfully, we are now living longer. The down side: **longevity** has emerged as a major risk factor in the development of breast cancer.

A review of the literature reveals a host of breast cancer risks, so many that it makes one wonder why breast cancer is not more common than it is. **Reproductive factors** appear to be the most relevant. *"Epidemiological studies indicate sexual history as the most important risk factor for breast cancer."* (Anguiano and Aceves, 2011) More specifically,

> *Established risk factors that increase the likelihood of developing breast cancer include age, family disposition, early menarche, late menopause, age at first childbirth, no breast feeding, benign mammary lesions, and hormone replacement therapy.* **(Gerber et al., 2003)**

The above quotation suggests that something you want, something you need, namely **estrogen**, is an important player in the development of breast cancer. We will visit this association a time or two during the course of our conversation.

Obviously, most of the reproductive-related risk factors mentioned above are not subject to change. But there are risks for developing breast cancer that are. The modifiable risk factors include **meat consumption**, with a higher risk associated with meat prepared "well-done"—the byproducts created are carcinogenic. Modifiable risk factors also include **physical inactivity** and **obesity** (Gerber et al., 2003). With respect to physical activity, surprisingly . . .

> *A retrospective study of 1945 physically active and 1995 physically inactive female college students revealed that,* ***after 16 years, athletes had a 40% decrease in breast cancer risk, which increased to 80% by the age of 45****, and this effect is still detectable in the postmenopause.* **(Gerber et al., 2003, emphasis added)**

Dietary factors identified to increase the risk of breast cancer include **fried and grilled foods**, due to the carcinogens produced. There is more. **Excessive caloric consumption,** and the excessive consumption of **saturated fats**, **sugar**, **alcohol,** *"significantly correlated with an increased risk of developing breast cancer."* (Gerber et al., 2003)

In view of the above, consider this:

> *It is widely accepted that breast cancer development is a multifactorial process with very limited impact of isolated single factors.* **(Gerber et al., 2003)**

The above statement clearly justifies a battle plan against breast cancer that includes reducing one's exposure to as many risk factors as reasonably possible. For you, certain life-style changes may be in order.

Before we move on, **smoking** needs to be addressed. Exposure to the carcinogens found in tobacco smoke substantially increases an individual's risk for contracting breast cancer. *"Tobacco smoke contains at least 20 chemical compounds that induce mammary cancers in rodents."* (Gaudet et al., 2013) Furthermore, *"Women who smoke have detectable smoking metabolites in their*

breast fluid." (Gaudet et al., 2013). It gets worse. The carcinogens in cigarette smoke can bind with specific segments of DNA associated with breast cancer risk (Gaudet et al., 2013). This is certainly not good news. Add smoking to the habitual consumption of alcohol, and the risk of breast cancer is further elevated (Gerber et al., 2003; Reynolds et al., 2004). Smoking. Drinking. Both can cause a lot of harm. Best stay away.

We have briefly reviewed the breast cancer risk factors that perhaps receive the most attention. We should certainly take notice—and concerted efforts to modify one's lifestyle to reduce exposure to the various breast cancer risks is a wise course of action. But we really need to get down to business. There are breasts to save. There are lives to save. How does a 40%, 50%, or perhaps up to a 70% reduction in breast cancer risk sound? Sounds good to me! Sounds like we need to talk about vitamin D.

Vitamin D deficiency

> *In the 1980s and 1990s, several observations suggested that living at higher latitudes increased the risk of developing and dying of colon, prostate, breast, and several other cancers.* **(Holick and Chen, 2008)**

> *Ecological studies have associated high levels of sunlight exposure with low breast cancer incidence and mortality rates.* **(Cui and Rohan, 2006)**

Stemming from observations that breast cancer occurs more frequently in those who have limited exposure to the sun, a new branch of research emerged and has yielded some very important insights into the actions of vitamin D and its role in preventing breast cancer, as follows . . .

First, vitamin D is not a true vitamin. It is a steroid hormone. Once it is transformed by tissues and cells into its active form (1,25(OH)2D), vitamin D has something important to do. Regulating genes is something important to do.

> *The local production of 1,25(OH)2D in non-calcium regulating tissues such as the colon, prostate, and breast is thought to be for the purpose of regulating up to 200 genes, which helps to control cell growth and cellular differentiation and may be responsible for decreasing the risk of the cells being transformed into a malignant state.* **(Holick and Chen, 2008)**

Second, vitamin D assists in the quiet disposal of aging, damaged breast cells, regulating the events that encourage them to commit suicide in a manner that renders them harmless and rapidly nonexistent. (Shao et all., 2012) Say goodbye to the cancerous and the precancerous breast cell. You won't miss them.

Third, vitamin D promotes DNA repair. *"Vitamin D enhances the expression of DNA repair genes . . . thereby promoting effective DNA double-strand break (DSB) repair, protecting cells from DNA damage and stress and consequently, carcinogenesis."* (Kitagishi et al., 2013) A cell with repaired DNA is less likely to become a cancer cell.

Fourth, vitamin D reduces local inflammation in the breast, simply because vitamin D deficiency increases local inflammation in the breast (Shao et all., 2012). It's that simple. *"Chronic inflammation is believed to contribute to the development and progression of breast cancer."* (Pierce et al., 2009)

Fifth, vitamin D downregulates the estrogen receptor. (Shao et al., 2012) This is obviously good news. The active form of **vitamin D** ***"suppresses the estrogen pathway*** *by reducing the expression of the gene coding aromatase, the enzyme that converts androgens to estrogens."* (Shao et all., 2012, emphasis added) More good news: **Active vitamin D** ***"downregulates estrogen receptor (ER)-α****, the receptor that mediates the actions of estrogen."* (Shao et al., 2012, emphasis added)

And finally, if the worst happens—a breast cell becomes transformed into a cancer cell—vitamin D inhibits the formation of a vascular supply that will allow the cancer cell to thrive and continually divide. It also blocks the cellular events that allow a cancer cell to metastasize. (see Shao et al., 2012)

With everything vitamin D has to offer in the battle against breast cancer, aren't you at least a little surprised, possibly outraged, so little attention is paid to vitamin D in the battle against breast cancer? Vitamin D wants to save you from this disease. What is standing in the way?

Unfortunately, our society is standing in the way. The knowledge we lack, the lifestyle we live, the actions we fail to take, the research we set aside, a medical profession seemingly unaware of the danger, allows vitamin D deficiency to exist and persist. It is very wide spread. It is an epidemic! This unfortunate state of affairs places people like you and people like me at great risk of a variety of diseases, breast cancer included. You are probably vitamin D deficient right now, and don't even know it.

Here is a test: Are you achieving a cumulative total of 1 to 2 hours of sun exposure each week, between 10 AM and 3PM (April through September), clothed just enough to be decent? **Yes/No?** Do you take a multivitamin containing vitamin D and do you drink 30 to 40 glasses of vitamin D-fortified milk per day? **Yes/No?** Do you take thousands of IUs of supplemental vitamin D per day (not hundreds, as is the current recommendation)? **Yes/No?** If you answered yes to any of the above, you are likely getting enough vitamin D and I

can take you off my list of people to worry about. Be aware, realistically, you can't eat enough walrus blubber or sardines to achieve or maintain vitamin D sufficiency. Believe me, I've tried! So, forget diet as the path to vitamin D sufficiency. It doesn't work. The amount of vitamin D we ordinarily obtain in our diet only helps us squeak by. What, then, should you consider?

If you are serious about breast cancer prevention, ask your physician to check your vitamin D level. Do not take "No" for an answer. Pay for the blood test out of pocket, if need be. (About 50 bucks, and well worth it.) The results obtained will determine if you are vitamin D deficient, how deficient you are, and will help define the steps necessary to help you achieve and maintain a respectable degree of vitamin D sufficiency, and be better protected from breast cancer. "So tell me," you ask, "what does a 'respectable degree of vitamin D sufficiency' look like?"

In a study conducted in Italy, women with a vitamin D level greater than 40 ng/mL demonstrated a **40% reduction** of breast cancer risk (Crew et al., 2011).

A study conducted in New York State demonstrated a **50% reduction** in breast cancer risk in subjects who were post-menopausal and maintain a vitamin D level greater than 40 ng/mL (Crew et al., 2011). Vitamin D is obviously powerful stuff, so it wouldn't surprise me at all if a greater than 40% to 50% reduction in breast cancer risk can be achieved . . . somewhere.

A large population-based study in Germany found about a **70% reduction** in breast cancer risk with a vitamin D level greater than 30 ng/mL in post-menopausal women (Crew et al., 2011).

One final study to add to the mix. This one is based on a combined analysis of two separate studies. The investigators report: "Women with 25(OH)D concentrations ≥ 40 ng/ml had a significantly lower risk of cancer (**~70%**) compared to women with concentrations <20 ng/mL." (McDonnell et al., 2016, emphasis added)

Are you getting the message? Only a vitamin D level will tell you where you stand. And it takes a vitamin D level of 30 ng/mL, 40 ng/mL, perhaps more, to achieve a robust level of breast cancer protection, the level of breast cancer protection you deserve. This will not be accomplished by the little vitamin D found in diet, a little vitamin D tucked into a multivitamin, a little vitamin D found in a few glasses of milk per day, and the little vitamin D generated by casual sunlight exposure. I will show you why.

"*In general, for every 100 IU of vitamin D, the serum 25OHD2 level increases by ~ 1.0 mg/mL."* (Shao et al., 2012) To put things into perspective, a multivitamin tablet containing 600 IU vitamin D, will create or support a vitamin

D level of 6 ng/mL. Add three glasses of milk per day (100 IU/glass) and now you're up to 9 ng/mL. I'll be generous and allow you causal sunlight exposure. If you're lucky, the vitamin D created by casual sunlight exposure during the right time of day and season of the year will add perhaps 10 ng/mL to your vitamin D level. Now you're up to about 20 ng/mL. Congratulations! You are vitamin D deficient, and not well protected against breast cancer.

> *Vitamin D levels >20ng/mL but <30ng/mL are considered insufficient. Data from observational* ***studies have suggested that the optimal level of 25(OH)D for breast cancer prevention is probably 40–60 ng/mL.*** **(Shao et al., 2012, emphasis added)**

I guess you have something important to do. Promptly have your vitamin D level checked. Follow up by taking the steps necessary to achieve and maintain a "respectable" degree of vitamin D sufficiency. This will take regular sunlight exposure and/or substantial vitamin D supplementation. Dietary sources of vitamin D and casual sunlight exposure are helpful but just not enough. For me, it takes 8,000 IU of vitamin D/day to keep my vitamin D level in the 40–60 ng/mL range. You may not need this level of supplementation. You may need 2,000 IU/day, 4,000 IU/day, or perhaps 6,000 IU/day to maintain a vitamin D level in the 40–60 ng/mL range. If you are significantly overweight, you may need more, a lot more—due to the fact that the more fat you have, the more vitamin D you place in storage. A physician can easily sort this all out and get you (and keep you) on the right track.

Since I spent so much time on vitamin D in this article, I will need to be brief as we continue. Next, we will discuss iodine deficiency. There is danger here.

Iodine deficiency

> *It has been demonstrated that iodine contributes to the maintenance of the normal integrity of the mammary gland.* **(Aceves et al., 2005)**

> *Iodine plays a role in the development and maintenance of healthy breast tissue (expanding after puberty) and in breast remodeling during lactation, and pregnancy.* **(Rappaport, 2017)**

> *Experimental findings showing the ability of iodine or iodine-rich seaweed to inhibit breast tumor development is supported by the relatively low rate of breast cancer in Japanese women who consume a diet containing iodine-rich seaweed.* **(Smyth, 2003)**

A Japanese woman, eating the traditional Japanese diet, maintains an *"exceptionally low*" risk of developing breast cancer (Rappaport, 2007). The reason? Her diet includes generous amounts of iodine due to the consumption of seaweed, which on average supplies 5,280 µg of iodine per day (Anguiano and Aceves, 2011). Take the same Japanese woman and move her to the USA,

allow her to adopt the Western diet, and her iodine intake dramatically drops to approximately 200 µg per day (Anguiano and Aceves, 2011). As a result, her *"exceptionally low"* breast cancer risk vanishes into thin air (Anguiano and Aceves, 2011). She could easily find herself among the one in eight.

Unfortunately, we have not come to terms with the fact that we, in the USA, are generally iodine deficient. This causes a lot of harm—including pregnancy loss, neurological damage to our offspring, and, of all things, a greater risk of breast cancer. And there are many reasons why we are deficient in iodine. I only have time to mention one.

One reason why iodine deficiency is prevalent in the USA is that we allow bromine, *"a suspected carcinogen,"* to be added to certain beverages and commercial bakery products. (This additive has been banned in many countries due to a variety of health concerns.) Bromine is evil because it interferes with the uptake of iodine in the thyroid gland and probably in the breast. (see Rappaport, 2017)

One team of investigators, studying the role iodine deficiency plays in the development of breast cancer, demonstrated in laboratory animals *"a potent protective effect (**70%**)"* on breast cancer following exposure to a potent carcinogen (Aceves et al., 2005, emphasis added).

Another piece of evidence that iodine has a protective effect against cancer development, is as follows:

> *Iodine deficiency is associated with fibrocystic breast disease, which can be effectively treated or prevented with iodine supplementation. Fibrocystic breast disease affects at least 50% of women of child-bearing age and is associated with an increased risk of developing breast cancer*. **(Rappaport, 2017)**

Clearly, iodine sufficiency should be part of your personal strategy to prevent breast cancer. There is no reliable laboratory test available to determine if you are iodine deficient, so if you follow the Western diet or if you are a vegetarian or vegan, assume that your iodine status is marginal at best. To become iodine sufficient, the recommendation of the experts is to include more iodine-rich foods in your diet and/or to supplement responsibly. Your physician can advise.

I should point out that supplementing with iodine is not without some risk. Occasionally, iodine supplementation can unmask an underlying thyroid hormone abnormality, creating symptoms that should promptly be reported (Teng et al., 2011; Pearce et al., 2013). That being said, it certainly appears that the benefits of iodine supplementation far outweigh the risks. Please consider placing iodine supplementation on your list of things to strongly consider in your

quest to lower your breast cancer risk. The evidence for a protective effect is very strong.

One more topic to discuss (briefly), then I'll let you go.

Iron excess

> *Iron overload, which was previously uncommon, has become more common in the United States than iron deficiency.* **(Moore et al., 2009)**

> *In humans, elevated body iron storage has been shown to increase the risk of several cancers including breast cancer.* **(Liehr and Jones, 2003)**

> *Both estrogen and iron are considered cancer promoters.* **(Jian et al., 2011)**

When it comes to breast cancer, excess dietary iron intake is not good news. *"In humans, elevated body iron storage has been shown to increase the risk of several cancers including breast cancer."* (Liehr and Jones, 2001) Surprisingly, estrogen does not act alone, it works hand in hand with iron in the development of breast cancer (Jian et al., 2011; Liehr and Jones, 2001). And it certainly appears that the more iron accumulation that occurs within the breast, over time, the greater challenges the breast cells face, which leads to a greater breast cancer risk. No one else is telling you this, so I guess it's up to me.

Our society is making one <u>big</u> mistake, and has for quite some time. We expose ourselves to iron in amounts far greater than our need. Sure, an individual can be low in iron, but not our population as a whole. So, to lend a helping hand to the children who may need extra iron to meet growth needs, or to help out those who need to replace iron due to iron loss during menstruation, we supplement and we fortify. But this is not without risk.

> *Iron supplements are ingested by a sizable portion of the population in the Unites States along with their daily vitamin pills or as a medication for real or suspected iron deficiency states. In addition, many foods are enriched with iron, including bread, cereal, other flour products and baby formulas. This iron supplementation is ingested in addition to the high consumption of red meat in the United States and other Western societies, which already provides a high basal level of dietary iron. In this way, the average American diet provides a positive daily iron balance.* **(Liehr and Jones, 2003)**

So, in a well-thought-out strategy to lower your breast cancer risk, it may be wise to limit dietary intake of foods high in iron, avoid taking supplements that contain iron (unless specifically directed by your physician), and donate blood on a regular basis. Donate blood?!! Yes. This is the best method available to reduce tissue iron stores, particularly suitable to address the problem of iron accumulation that normally occurs postmenopausal. (Before then, you donated

blood on a monthly basis, if you will recall . . . all the misery.) There is not a lot in the literature that supports blood donation as a strategy for breast cancer prevention, but it can only help. And even if it doesn't make that big of a difference in reducing your risk of breast cancer, look at all the people you will be helping. With regular blood donation, you might even lower your risk of cardiovascular disease, neurodegenerative disease, and other forms of cancer. One more thing to mention along these lines . . .

Antioxidant supplementation have been shown to help reduce the risk of breast cancer associated with elevated iron intake. According to one study, *"a direct association between processed meat intake (rich in heme iron) and breast cancer risk, and this association was no longer significant in the group supplemented with antioxidants."* (Diallo et al., 2016)

Conclusion

Before you read this article, you may have thought that little if anything could be done to lower your breast cancer risk. Perhaps now you know differently, and realize that by taking a few simple steps you can substantially reduce your risk of one of the greatest evils of our time. Don't be found among the one in eight.

Related Post

What Is This? (It Might Have Something to Do with Vitamin D)

Highly recommended

Everything You Need to Know About Your Breasts Before and After Pregnancy

References

Aceves C, Anguiano B, Delgado G 2005 Is Iodine a Gatekeeper of the Integrity of the Mammary Gland? Journal of Mammary Gland Biology and Neoplasia. Apr 1; 10(2):189–196

Anguiano B, Aceves C 2011 Iodine in Mammary and Prostate Pathologies. Current Chemical Biology. Sep 1; 5(3):177–182

Crew KD, Gammon MD, Steck SE, Hershman DL, Cremers S, Dworakowski E, Shane E, Terry MB, Desai M, Teitelbaum SL, Neugut AI 2009 Association Between Plasma 25-Hydroxyvitamin D and Breast Cancer Risk. Cancer Prevention Research. Jun 1; 2(6):598–604

Cui Y, Rohan TE 2006 Vitamin D, Calcium, and Breast Cancer Risk: A Review. Cancer Epidemiol Biomarkers Prev 15(18):1427–1437

Diallo A, Deschasaux M, Partula V, Latino-Martel P, Srour B, Hercberg S, Galan P, Fassier P, Guéraud F, Pierre FH, Touvier M 2016 Dietary iron intake and breast cancer risk: modulation by an antioxidant supplementation. Oncotarget. Oct 12; 7(48):79008–79016

Gaudet MM, Gapstur SM, Sun J, Diver WR, Hannan LM, Thun MJ 2013 Active Smoking and Breast Cancer Risk: Original Cohort Data and Meta-Analysis. Journal of the National Cancer Institute. Feb 28: djt023

Gerber B, Müller H, Reimer T, Krause A, Friese K 2003 Nutrition and Lifestyle Factors on the Risk of Developing Breast Cancer. Breast Cancer Research and Treatment. May 1; 79(2):265–276

Holick MF, Chen TC 2008 Vitamin D Deficiency: A Worldwide Problem with Health Consequences. The American Journal of Clinical Nutrition. Apr 1; 87(4):1080S–1086S

Jian J, Yang Q, Dai J, Eckard J, Axelrod D, Smith J, Huang X 2011 Effects of Iron Deficiency and Iron Overload on Angiogenesis and Oxidative Stress—A Potential Dual Role for Iron in Breast Cancer. Free Radical Biology and Medicine. Apr 1; 50(7):841–847

Kitagishi Y, Kobayashi M, Matsuda S 2013 Defective DNA Repair Systems and the Development of Breast and Prostate Cancer (Review). International Journal of Oncology. Jan 1; 42(1):29–34

Liehr JG, Jones J 2001 Role of Iron in Estrogen-Induced Cancer. Current Medicinal Chemistry. Jun 1; 8(7):839–49

McDonnell SL, Baggerly C, French CB, Baggerly LL, Garland CF, Gorham ED, Lappe JM, Heaney RP 2016 Serum 25-Hydroxyvitamin D Concentrations ≥ 40 ng/mL Are Associated with > 65% Lower Cancer Risk: Pooled Analysis of Randomized Trial and Prospective Cohort Study. PloS one. Apr 6; 11(4):e0152441

Moore AB, Shannon J, Chen C, Lampe JW, Ray RM, Lewis SK, Lin M, Stalsberg H, Thomas DB 2009 Dietary and Stored Iron as Predictors of Breast Cancer Risk: A Nested Case-Control Study in Shanghai. International Journal of Cancer. Sep 1; 125(5):1110–1117

Pearce EN, Anderson M, Zimmerman MB 2013 Global Iodine Nutrition: Where Do We Stand in 2013? Thyroid. 23(5):523–528

Pierce BL, Ballard-Barbash R, Bernstein L, Baumgartner RN, Neuhouser ML, Wener MH, Baumgartner KB, Gilliland FD, Sorensen BE, McTiernan A, Ulrich CM 2009 Elevated Biomarkers of Inflammation Are Associated with Reduced Survival Among Breast Cancer Patients. Journal of Clinical Oncology. May 26; 27(21):3437–3444

Rappaport J. 2017 Changes in Dietary Iodine Explains Increasing Incidence of Breast Cancer with Distant Involvement in Young Women. Journal of Cancer. 8(2):174–177

Reynolds P, Hurley S, Goldberg DE, Anton-Culver H, Bernstein L, Deapen D, Horn-Ross PL, Peel D, Pinder R, Ross RK, West D 2004 Active Smoking, Household Passive Smoking, and Breast Cancer: Evidence from the California Teachers Study. Journal of the National Cancer Institute. Jan 7; 96(1):29–37

Shao T, Klein P, Grossbard M 2012 Vitamin D and Breast Cancer. The Oncologist. Jan 1; 17(1):36–45

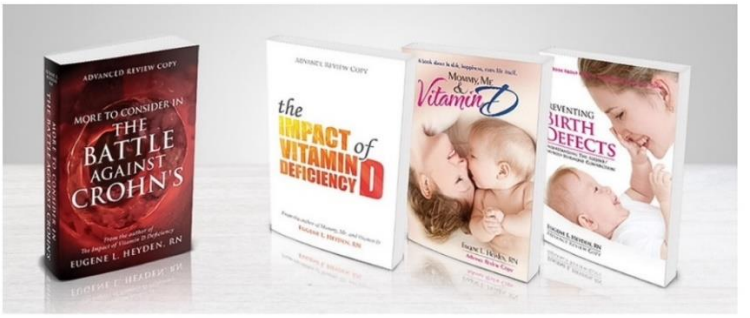
Smyth PP 2003 The Thyroid, Iodine and Breast Cancer. Breast Cancer Research. Jul 29; 5(5):235–238

Teng X, Shan Z, Chen Y, Lai Y, Yu J, Shan L, Bai X, et al 2011 More Than Adequate Iodine Intake May Increase Subclinical Hypothyroidism and Autoimmune Thyroiditis: A Cross-Sectional Study Based on Two Chinese Communities with Different Iodine Intake Levels. European Journal of Endocrinology 164:943–950

therapy. This article is offered to the reader to broaden his or her understanding of the issues discussed and to help identify options that may be suitable for the individual to pursue, on behalf of self or others, under approval and direction of a qualified physician. The author and publisher offer no guarantees of the accuracy or validity of the quotations incorporated into this article or the accuracy or validity of the information presented by the resources that are herein recommended.

www.impactofvitamind.com

Books by Eugene L. Heyden, RN



All books available from . . .

www.impactofvitamind.com

amazon.com

Or worldwide from

Book Depository .com