ASK THE DOCTOR
Answers to Your Health Questions

Breast Cancer & Nutritional Supplements

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There is probably nothing more frightening for a woman than the discovery of a lump in her breast. Cancer and all its consequences quickly comes to mind. This quick association may materialize, in part, because no woman is immune. Most have a friend, a sister, a mother, or a coworker who has been diagnosed with the disease. And they know how difficult dealing with this disease can be. Fortunately, 80% of all breast lumps are not cancerous. Most are cysts or a benign clump of tissue.[1]

Over her lifetime, a woman's breasts undergo many, many changes. From before puberty and on, breast tissue is continually evolving. Breasts often feel different before the menstrual cycle, returning to normal a few days after. Pregnancy certainly causes changes in a woman's breasts, as does breastfeeding. And as women age, breast tissue becomes less dense.[2]

Because of these continual changes, breast tissue especially requires adequate nutrition. While everyone benefits from a healthy diet, there are additional nutrients from which women can specifically benefit.

In this issue of *Ask the Doctor*, we will discuss breast cancer and the vast amount of research that has explored the role nutrition plays in this serious and still deadly disease. Specifically, we will discuss how two B vitamins, calcium D-glucarate, broccoli extract, green tea, maitake mushrooms, and iodine can all help prevent breast cancer.

Q. How can these nutrients prevent breast cancer?

A. Scientists learn a lot about disease from simply observing what is happening around them. One observation that has been recognized for many years is that certain cultures have very low incidence of breast cancer. Women in China and Japan are good examples of this. Compared to women in America, Canada, and parts of Europe, Asian cultures have much lower breast cancer rates. It seems likely that something in their diet might be protecting these women from the disease because once asian women adopt a western diet, their breast cancer rates climb.[3-5]

Moms (and dads) have also learned a lot about diseases simply by observing what is happening in their families. They have noticed that certain vegetables play a large role in the prevention of all types of disease, including cancer. And, accordingly, they have been urging their offspring to eat their vegetables for several generations.

Building on these observations, scientists have designed and carried out many studies to determine what it is about these nutrients that can prevent breast cancer. What they have discovered, so far, follows. Let's start with the B vitamins.

Vitamin B12

Deficiencies of this vitamin can result in a serious type of anemia. Nerve damage can also occur if B12 levels are too low.[6] Researchers are now investigating whether breast cancer may, in part, be caused by a B12 deficiency as well.

At Johns Hopkins University in Maryland, two large but separate blood sample donations were evaluated against cases of breast cancer. In 1974, 12,450 blood samples were donated by female volunteers. In 1989, another 14,625 women again voluntarily donated samples of their

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blood. Cases of breast cancer that occurred in these groups of women were then recorded and their blood samples examined. Women who had the lowest levels of B12 in their blood, had the highest rates of breast cancer.[7]

Another study, this one taking place in a laboratory setting, discovered that vitamin B12, applied directly against experimental breast cancer cells, actually stopped the cancer cells from growing. The researchers conducting the experiment believe that giving vitamin B12 to women with breast cancer as part of a chemotherapy regime, might help keep the cancer in check.[8]

Folic Acid

Low folic acid intake is linked to the development of all cancers. This is because folic acid is crucial to the making and continual repair of DNA, the molecule that carries our genetic code. A recent study discovered that high intakes of folic acid might actually reduce the risk of breast cancer. The researchers looked at the diets of over 2600 women. During interviews with the researchers, the women reported what they usually ate. Once the data was collected, the results showed that women who ate lots of foods that contained folic acid, had much lower rates of breast cancer.[9]

There is no clear-cut, single cause of breast cancer. Many factors are required for the disease to appear. One such factor is estrogen. A recent study showed that women who developed breast cancer tended to have higher levels of estrogen circulating in their bodies than women without breast cancer. This means that women who got their periods before age eleven or entered menopause after age fifty-five have a higher risk of breast cancer. This also supports the theory that the number of menstrual cycles a woman has affects her risk for breast cancer.[10]

Another factor is drinking alcohol. Because alcohol raises estrogen levels, if a woman consumes even moderate amounts of alcohol her risk of breast cancer also is increased. The link between alcohol and breast cancer may even be stronger than other dietary links.[11,12] However, an important study has discovered that folic acid may uncouple this link.

A very large study of over 34,000 women recently studied the effect of folic acid on the risk of breast cancer. This project was part of the Nurses' Health Study, an ongoing, long-term study that looks at nutrition's role in the development of disease. The women in the folic acid and breast cancer study were followed for 12 years. The participants completed detailed food questionnaires that provided the researchers with important data.[13]

The women were divided into four groups:

1 Women with low folic acid levels and drink alcohol	2 Women with high folic acid levels and drink alcohol
3 Women with low folic acid levels and don't drink alcohol	4 Women with high folic acid levels and don't drink alcohol

Within these four groups the women were further divided into subgroups according to the amount of alcohol they consumed each day and their specific folic acid intake.

The researchers found that women who consumed the lowest amounts of folic acid and drank at least one alcoholic beverage a day had the highest rate of breast cancer. In contrast, women who had high intakes of folic acid and also drank at least one alcoholic beverage a day, had the same rate of breast cancer as the women with high folic acid intakes who did not drink. In other words, woman who had high levels of folic acid in their diet, erased their alcohol-related increase in breast cancer risk.[13]

Calcium D-Glucarate

It seems estrogen can be both friend and foe. While women need the hormone to soften skin, thicken hair, and fill out hips and breasts, estrogen can also nourish breast tumors, helping them grow bigger, stronger, and more deadly. Thanks, in part, to good nutrition, American women get their periods early and go through menopause later in life. Women today also have fewer pregnancies; families with one or two children are quite common.[14]

All of these factors increases the time women's bodies are exposed to estrogen. As we discussed before, longer exposure means increased opportunities for estrogen to cause trouble. It is also a troubling fact of modern life that we are continuously exposed to cancer-causing chemicals and toxins. These toxins come in part from contaminants in the food we eat and pollutants in the air we breathe.[14]

The body does have a system that eliminates some of the excess estrogen and toxic chemicals before they can cause harm. In the liver, they are bound or attached to a chemical called glucuronic acid. The bound toxin or estrogen is then excreted in bile and eventually eliminated as a waste product in the stool.[15]

However, an enzyme called beta-glucuronidase can break this bond between estrogen and glucuronic acid. When this happens, the hormone or toxin is released from its bond, capable of causing harm once more. Increased beta-glucuronidase activity is associated with an increased risk for various cancers, particularly hormone-dependent cancers like breast cancer.[15]

Fortunately, scientists have discovered that a natural substance found in foods, calcium D-glucarate (CDG) can stop the activity of beta-glucuronidase. CDG keeps the harmful estrogen bound to glucuronidase.[15-17] While CDG is found in fruits and vegetables, the amounts may not be sufficient to maintain effective levels to stop beta-glucuronidase.[15]

CDG has been shown in experimental studies to significantly stop breast cancer growth.[16,17] And several human trials are currently underway with CDG to determine its capability to decrease the breast cancer risk in women at high risk for the disease.

Iodine

There are some very interesting connections between breast tissue and thyroid tissue. Iodine is an essential trace element present in a hormone of the thyroid gland and is involved in several metabolic functions. One iodine function

is the protection of breast tissue from cancerous cells.[18,19]

In a laboratory study, researchers exposed breast cancer cells and breast tissue without any cancer to a type of seaweed that contains high levels of iodine. The seaweed killed all of the cancerous cells, yet did not harm the normal breast cells. Japanese women frequently eat this type of seaweed and have very low rates of breast cancer. The study's researchers believe one reason for this low incidence of breast cancer may be the iodine in the seaweed.[20]

And, for some as yet unknown reasons, women who had thyroid cancer are at higher risk of developing breast cancer.[21] While they are unsure why this happens, researchers are continuing to study this link, and support of healthy thyroid function remains an important consideration.

Broccoli
For quite some time, scientists have observed that cruciferous vegetables, such as broccoli, cabbage, and cauliflower, significantly reduce the risk of disease, including cancer. It seems a phytochemical in broccoli, sulforaphane, is one of the chemicals responsible for this beneficial activity. Sulforaphane increases certain enzymes in the body called phase 2 enzymes that deactivate cancer-causing chemicals.[22]

Breast cancer cells exposed to sulforaphane in several lab experiments showed that the compound inhibited the growth of the cancer cells up to 80 percent.[23] Researchers are in the process of setting up clinical trials to study sulforaphane's effect in women who have breast cancer.

Green Tea
There is a fair amount of research, including findings from the Nurses' Health Study, that suggests green tea beverage consumption is associated with a lower incidence of breast cancer.[24] In fact, researchers have long noted the low rates of breast cancer in Japan, a country where green tea consumption is very high.

The active compound in green tea responsible for breast cancer inhibition is epigallocatechin-3 gallate or EGCG. When breast cancer cells are exposed to EGCG in lab experiments, the cells stop growing, lose their ability to replicate, and die.[25,26]

In a recent study, researchers discovered that drinking green tea prevented the recurrence of breast cancer in women who had previously been diagnosed and treated for the disease. This study involved over 1100 Japanese women. The women who drank green tea every day had very low rates of their breast cancer returning.[27]

Maitake Mushrooms
For thousands of years, maitake mushrooms have been linked to good health in those who eat them. Called "dancing mushrooms" (possibly due to their wavy, rippling appearance or possibly due to the little dance of joy mushroom hunters perform when they find them in the woods), maitakes contain an important compound called D-fraction.[28]

Not only does the D-fraction in maitake mushrooms stop the growth of cancerous tumors, it also alerts and stimulates immune cells (including macrophages and natural killer cells) to fight the disease. Maitake also inhibits some of the mechanisms that promote metastasis, or spread, of cancer cells in the lymph and bloodstream.[29-31]

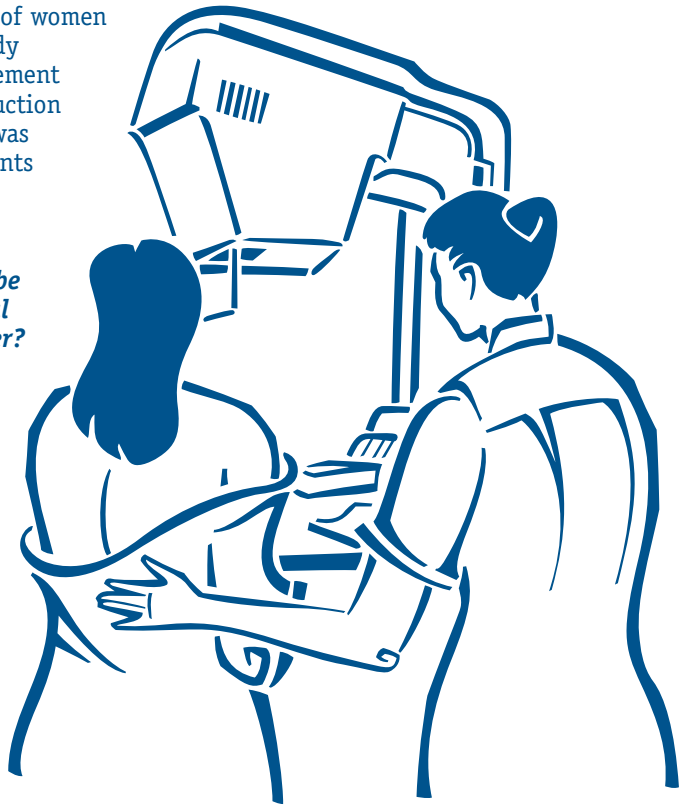
Because of this success, maitake is now being used in clinical trials of women with breast cancer. One study reported significant improvement of symptoms, including reduction of the tumor. The maitake was given to breast cancer patients in addition to standard chemotherapy.[32]

Q. Should these nutrients be used in place of traditional treatment for breast cancer?
A. Absolutely not. None of these nutrients can cure breast cancer. However, they can be a part of a validated plan of treatment. If you have breast cancer, talk to your health care practitioner about these nutrients. Remember, nutritional supplements are just that: supplements to food, medication, and treatment. They are intended to enhance and prevent, not replace.

Conclusion
Despite apprehension in performing self-breast exams, women are very proactive in their health. Yearly mammograms and pap tests have been an important part of their lives for many years, and newer and more accurate diagnoses are emerging. The prevention of health problems in themselves and their families has always been a high priority for women. And for women, nutrition has played an important part of health problem prevention.

Nutritionally speaking, what benefits your breasts benefits your whole body. However, as we have learned, there are specific links between nutrition and developing breast cancer that seem to be fairly strong.

Making a few changes may reduce the risk of developing the disease. The nutrients listed here, vitamin B12, folic acid, calcium d-glucarate, iodine, broccoli, green tea, and maitake mushrooms can be an important part of a woman's preventative health regimen.



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