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Chemoprevention [1]

This section has been reviewed and approved by the [Cancer.Net Editorial Board](#) [2], 11/2015



Listen to the [Cancer.Net Podcast: What is Chemoprevention?](#) [3], adapted from this content.

About chemoprevention

Cancer chemoprevention is the use of substances to stop or keep cancer from developing. These substances may be natural, made in a laboratory, or taken from a living source.

Cancer begins when healthy cells change and grow uncontrollably, forming a mass called a tumor. A tumor can be cancerous or benign. A cancerous tumor is malignant, meaning it can spread to other parts of the body. A benign tumor means the tumor will not spread. The transition from a healthy cell to a cancerous one is a process that usually takes many years. Many genetic, dietary, and lifestyle factors, such as smoking, may influence this process.

Chemoprevention is typically used by people who have a higher risk of developing cancer. People with a higher risk of cancer include those with an inherited cancer syndrome or a family history of cancer. Chemoprevention is not used to treat cancer. However, people who have had cancer may use chemoprevention to lower the risk of the cancer returning after treatment or the risk of new cancers.

Examples of chemoprevention

Here are some examples of drugs used for chemoprevention:

- **Tamoxifen (Nolvadex, Soltamox) and raloxifene (Evista).** These medicines have been studied as ways to reduce breast cancer risk. These drugs are most effective in lowering the risk of estrogen receptor-positive breast cancer. Breast cancer that is estrogen receptor-positive means that the cancer depends on the hormone estrogen to grow. Tamoxifen blocks the effects of estrogen on tumor growth. It has been shown to lower the risk of breast cancer recurrence. A recurrence is when the cancer comes back after treatment. It also has been shown to lengthen the lives of women with early-stage breast cancer. Meanwhile, raloxifene has been shown to lower the risk of breast cancer in women who have gone through menopause. Learn more about [drugs to lower breast cancer risk](#) [4].
- **Aspirin and other non-steroidal anti-inflammatory drugs (NSAIDs).** NSAIDs may lower the risk of many types of cancer in people with an average risk of cancer.

Chemoprevention may delay cancer. However, a person using a chemopreventive drug could still develop cancer in the future. In this respect, chemoprevention for cancer may be similar to using drugs—such as statins or antihypertensive drugs, which are not 100% protective—to prevent heart disease or stroke.

Risks and benefits of chemoprevention

Before taking any drug, talk with your doctor about the risks and benefits of chemoprevention. For example, drugs that may lower the risk of cancer may increase the risk of [side effects](#) [5]. People with a higher risk of developing cancer may be willing to accept specific side effects. However, others may not want to use a drug that gives them side effects when they are not already sick. Everyone's preferences are different.

Talk with your doctor about your risk of developing cancer, your current health status, and your preferences for taking medication. It is also important to talk with your doctor about how much a type of chemoprevention may lower your cancer risk. The effect of chemoprevention seen in research studies may be different for you. Learn more about [understanding cancer risk](#) [6].

Chemoprevention in clinical trials

All drugs or other substances that have shown evidence of lowering cancer risk are tested in [clinical trials](#) [7]. Clinical trials are research studies involving volunteers. A chemoprevention-specific study tests a substance to evaluate whether it is safe and effective in delaying or preventing cancer. Other chemoprevention methods have been found unintentionally while studying the method for another purpose. For example, raloxifene was originally being studied as a way to strengthen bones. During the study, researchers found that women taking raloxifene were less likely to get breast cancer.

Often, substances that seem to prevent cancer in a laboratory setting don't prevent cancer

when tested in people. Moreover, some clinical trials have shown that certain types of chemoprevention cause harms—some serious or even life threatening. For example, beta carotene, a substance found in carrots, squash, and similar vegetables was thought to help prevent lung cancer. When tested in clinical trials, though, it raised the risk of lung cancer in people who smoked.

Another clinical trial of selenium and vitamin E for prostate cancer showed that neither selenium nor vitamin E lowered the risk of prostate cancer. And, there was evidence that men who took vitamin E had an increase in prostate cancer. Learn more about [vitamins and minerals](#) [8].

Clinical trials often reveal that chemopreventive substances do not work for every person. This is similar to other drugs used for cancer treatment or for the prevention of other diseases, such as heart disease. When evaluating the results of chemoprevention clinical trials, it is important to look at the group of participants. Often, people participating in these types of clinical trials have known, increased risks for cancer, such as smoking or having a family history of cancer, so the results of the study may not be applicable to everyone.

More Information

[Cancer Screening](#) [9]

Additional Resource

[National Cancer Institute: Prevention](#) [10]

Links

[1] <http://www.cancer.net/navigating-cancer-care/prevention-and-healthy-living/chemoprevention>

[2] <http://www.cancer.net/about-us>

[3] <http://www.cancer.net/node/22998>

[4] <http://www.cancer.net/node/29926>

[5] <http://www.cancer.net/node/25238>

[6] <http://www.cancer.net/node/25007>

[7] <http://www.cancer.net/node/24863>

[8] <http://www.cancer.net/node/24987>

[9] <http://www.cancer.net/node/24972>

[10] <http://www.cancer.gov/cancertopics/pdq/prevention>