Chemoprevention

This section has been reviewed and approved by the Cancer.Net Editorial Board [1], March / 2012

Listen to the Cancer.Net Podcast: What is Chemoprevention? [2], adapted from this content.

Key Messages

- Chemoprevention can lower the risk of cancer or slow its development. It is not used to treat cancer.
- Substances thought to lower cancer risk are studied in clinical trials to make sure they are safe and actually prevent cancer.
- Talk with your doctor about your risk for cancer and the benefits and risks (including side effects) of taking a drug that may lower your risk of cancer.

About chemoprevention

Cancer chemoprevention is the use of natural, synthetic (made in a laboratory), or biologic (from a living source) substances to reverse, suppress, or prevent the development of cancer.

Cancer is a disease in which cells become abnormal, invade healthy tissue, and grow uncontrollably. The transition from a healthy cell to a cancerous one is a process that usually takes many years and may be influenced by genetic, dietary, and behavioral factors (such as smoking). Chemopreventive agents, alone or in combination with each other, can help prevent that process from occurring or slow it down. Chemoprevention is not used to treat existing cancer, but may be used in people who have had cancer in order to lower the risk of developing new cancers.

Chemoprevention is typically used by people who have a higher risk of developing cancer, including those with a previous cancer, an inherited cancer syndrome, or a family history of cancer.

Examples of chemoprevention

Some examples of chemoprevention are:

- Tamoxifen (Nolvadex), an estrogen blocker that reduces the risk of developing breast cancer, and raloxifene (Evista), which lowers the risk of developing breast cancer in women who have been through menopause. Learn more about drugs to lower breast cancer risk [3].
- Finasteride (Propecia, Proscar) and similar drugs that lower prostate cancer risk by reducing the amount of dihydrotestosterone (a male hormone) produced by the body. Learn more about prostate cancer chemoprevention [4].
- Aspirin and other non-steroidal anti-inflammatory drugs (NSAIDs) to lower the risk of many types of cancer in people with an average risk of cancer.

Although chemoprevention may delay cancer, it is possible that a person could still be diagnosed with cancer in the future. In this respect, chemoprevention for cancer may be similar to drugs used to prevent heart disease or stroke, such as statins or antihypertensive drugs, which are not 100% protective.

Risks and benefits of chemoprevention

As with any drug or medication, talk with your doctor about the risks and benefits of chemoprevention. Lowering the risk of cancer is often a benefit, whereas unwanted side effects [5] are a risk. Also discuss your risk of developing cancer, your preferences for taking a medication, and your current health.

For instance, a person with a higher risk of developing cancer may be willing to accept specific side effects, if the tradeoff is a lower risk of cancer. However, a healthy person may not want to take a medication that gives them side effects when they are not already sick. Everyone's preferences are different.

Chemoprevention in clinical trials

All drugs or other substances that have shown evidence of lowering cancer risk are tested in clinical trials. Clinical trials [6] are research studies in

people. A chemoprevention study tests a new chemopreventive agent to learn whether it is safe, effective, and actually delays or prevents cancer.

Often, substances that seem to prevent cancer in the laboratory setting don't prevent cancer when tested in people. In some situations, chemoprevention was shown to cause harms, some of which were serious or even life-threatening. For example, beta carotene, a substance found in carrots, squash, and similar vegetables, was thought to help prevent 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 even evidence that men who took vitamin E had an increase in prostate cancer. Learn more about vitamins and minerals [7].

Clinical trials often reveal that chemopreventive agents 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 with known, increased risks for cancer, such as those who smoke or have a family history of cancer, are studied, so the results of the study may not be applicable to everyone. For example, in the tamoxifen clinical trials, the participants were at elevated risk for developing breast cancer.

More Information

Understanding Cancer Risk [8]

Cancer Screening [9]

Additional Resources

National Cancer Institute: Prevention [10]

Links:
[1] http://www.cancer.net/about-us
[2] http://www.cancer.net/sites/cancer.net/files/What_is_Chemoprevention.mp3
[3] http://www.cancer.net/node/25650
[4] http://www.cancer.net/node/25596
[5] http://www.cancer.net/node/25238
[6] http://www.cancer.net/node/24863
[7] http://www.cancer.net/node/24987
[8] http://www.cancer.net/node/25007
[9] http://www.cancer.net/node/24972
[10] http://www.cancer.gov/cancertopics/pdq/prevention