Chemoprevention Basics

Key Points

- Chemoprevention is the use of drugs to prevent the onset or recurrence of cancer.
- Biomarkers will help determine who will most benefit from chemoprevention agents – this is an example of personalized medicine.
- Chemoprevention is still in an early stage of development, but with the new discoveries being made everyday in human genetics and biology, they will be an increasingly important tool in the fight against cancer.

1. What is prevention, specifically chemoprevention?

If you have a higher risk for a certain type of cancer than most people, you may want to learn about ways to prevent cancer. There are two types of preventive measures that may help reduce the risk of getting cancer:

- **Action** (*doing* something) such as exercising or quitting smoking.
- **Agents** (*taking* something) such as a chemopreventive agent. **Chemoprevention** is the use of drugs, vitamins, or other agents to reduce the risk of developing, or to delay the development or recurrence of cancer.

2. Is chemoprevention different from chemotherapy?

Yes. **Chemotherapy drugs** (also called chemo) are chemicals used to treat cancer. Chemotherapy drugs are often given in high doses to aggressively kill cancer cells and have unpleasant side effects. **Chemoprevention drugs** are used to prevent cancer from developing at all, prevent existing premalignant conditions from developing into life-threatening cancer, or prevent cancer recurrence. In some cases, chemopreventive drugs will be taken for years or even for life.

3. What is personalized medicine?

Each person's body is different and may respond differently to the same treatment. In some cases, laboratory tests can accurately predict if a treatment will be effective in a particular person.

Personalized medicine looks at the ways in which a person's body processes and responds to different medications.

- First, patients receive blood tests to look at his/her body's genetic variations.
- Then, doctors and patients make decisions about personalized treatment option and medication and dosing choices.

As scientists learn more about peoples' genetic variations, the better personalized medicine will become. Scientists are trying to identify biomarkers (see below) that will tell them which people

are at greater risk for developing cancer, or who will respond better to certain drugs, so that individualized treatment plans can be created.

5. What is a biomarker?

A **biomarker** is a substance found in the body that indicates the presence of a risk factor or early indicator for cancer or other disease. It can be found in the blood, other body fluids, or in tissues. The presence of a certain level of biomarker may mean that a certain type of cancer is in the body or a person is at greater risk of developing a certain type of cancer. Doctors can use biomarkers to see who is at risk for developing cancer and take measures to prevent cancer from developing.

Currently, biomarkers are only used to treat cancer. Researchers are studying biomarkers in clinical trials for detecting cancer risk.

6. Why aren't chemopreventive agents being developed more quickly?

Since cancer is a collection of hundreds of individual diseases that occur in different sites of the body and develop through many different processes, a great deal of research is needed to understand all of the different way to prevent each type of cancer. When scientists learn why different cancers develop in the first place, they will be better able to target the processes that lead to cancer before cancer cells begin to form. Once scientists discover how to detect cancer before it forms (using biomarkers), they will be better able to create drugs to prevent cancer cells from ever developing.

Current research stretches the boundaries of science and challenges the systems in place for drug development. Barriers in developing chemopreventive agents more quickly include scientific and regulatory barriers, limitations in patent law, the uncertainty of reimbursement, lack of public and patient participation in clinical trials and the uncharted drug approval process for new chemopreventive agents.

7. Why are chemopreventive agents important?

The American Cancer Society estimates that more than 50% of all cancers deaths could be prevented through lifestyle changes like not smoking, maintaining a healthy weight, and staying out of the sun. Chemoprevention research may lead to more strategies to effectively prevent, slow, or avoid fatal outcomes for all cancers. Currently, the best way to reduce your risk for getting cancer is to make healthy lifestyle choices and obtain regular cancer screenings. Scientists are eager to discover how to prevent cancer to reduce needless pain and suffering and one of the most promising ways they will do that is through chemoprevention.

Related Resources:

National Cancer Institute
Telephone: 1-800-4-CANCER
Web site: www.dcp.cancer.gov

American Cancer Society
Telephone: 1-800-ACS-2345
Web site: www.cancer.org