What is Chemoprevention?

Chemoprevention is the use of a medication, vitamin or supplement to stop cancer from happening. This is most often used for people who have a high risk of developing cancer. They may have a strong family history, carry an abnormal gene, or have a personal health history that makes their risk higher.

Chemoprevention can be used in three ways:

- **Primary prevention**: Using a medication, vitamin, or supplement to prevent cancer in a healthy person.
- **Secondary prevention**: Using a medication, vitamin, or supplement to prevent a pre-cancerous area from becoming cancer.
- **Tertiary prevention**: Using a medication, vitamin, or supplement in a person who has already had cancer, to prevent them from developing another cancer.

What makes a good chemoprevention agent?

The ideal chemoprevention agent:

- Does not cause side effects that affect quality of life.
- Is inexpensive and easy to get.
- Is safe for the person taking it (does not have dangerous side effects).
- Is good at preventing cancer.

Weighing the Risks and Benefits of Chemoprevention

Every medication, vitamin, or supplement can have side effects. In some cases, these can be serious. Discuss the risks of any chemoprevention with your healthcare provider. In some cases, the risks outweigh the benefits, and you may decide that chemoprevention is not right for you. In other people, the benefit of cancer prevention may make the side effects tolerable. It is an individual choice, taking into consideration your personal cancer risk and other health history.

Examples of Chemoprevention

**Chemoprevention in Breast Cancer**

Breast cancer chemoprevention trials have set the standard for other cancer types to follow. Tamoxifen and Raloxifene are selective estrogen receptor modulator medications (also called a SERMs). SERMs work to prevent breast cancer by interfering with estrogen, a female hormone that causes breast cancer growth. Both of these medications have been found to reduce breast cancer risk by as much as 50% in women at high risk.

**Chemoprevention in Prostate Cancer**

Prostate cancer is the most common cancer that occurs in men, making it a good target for chemoprevention. There have been a number of studies looking at medications (finasteride and dutasteride), vitamins and supplements (vitamin E, selenium, beta-carotene) to prevent prostate cancer. The studies of finasteride and dutasteride found that their risks outweighed the benefit that was seen. Neither selenium nor beta-carotene reduced prostate cancer risk. High dose vitamin E actually resulted in higher rates of prostate cancer! Due to these studies, chemoprevention is not used to prevent prostate cancer. However, researchers continue to look for a substance that will be effective in reducing risk.

**Chemoprevention in Colon Cancer**
Studies have found that regular use of aspirin and/or other non-steroidal anti-inflammatory drugs (NSAIDs) results in a 20-40% reduction in the risk of developing colorectal polyps and cancer. This sounds like great news, but there are a few things to consider. These medications need to be taken regularly, for a long period of time (10 or more years). These medications have their own side effects, including bleeding and, in the case of NSAIDs, increased risk of heart disease. These medications may be most useful in people with a particularly high risk of colon cancer, including those with a genetic risk. As always, discuss your own risk with your healthcare provider before starting any medication.

Other Cancer Types
Chemoprevention is also being studied in other cancers such as head and neck, lung, and skin cancer. Only large clinical trials conducted for many years can determine whether a compound will reduce the risk of cancer. And with every chemopreventive agent, patients and their care providers need to have a thorough discussion of the risks and benefits.