

Reducing the Risk of Subsequent Cancers

The risk of cancer increases for everyone as they age. Several studies have shown that as childhood cancer survivors become older, they have a slightly higher risk of developing (a subsequent) cancer compared to people their same age in the general population. Things that can contribute to this risk are the person's age during cancer therapy, their specific treatment, and their genetic and family history.

Who is at risk for a subsequent cancer?

- **People who received certain chemotherapy drugs.** Some treatments for childhood cancer increase the risk of developing subsequent cancer as survivors age. The risk of developing a leukemia from treatment is increased for people who were treated with high doses of alkylating agents (such as cyclophosphamide or nitrogen mustard), heavy metals (such as cisplatin or carboplatin, epipodophyllotoxins (such as etoposide or teniposide), and anthracycline chemotherapy drugs (such as doxorubicin or daunorubicin), and for those who received an autologous hematopoietic cell transplant. While leukemias from treatment are rare, the risk is highest within the first 10 years after completing cancer treatment and then decreases over time.
- **People who received radiation therapy, especially at a young age.** Radiation therapy given for childhood cancer increases the risk of developing a secondary solid tumor as a person ages. The most common sites include the skin, breast, central nervous system (the brain and spine), thyroid gland, lungs and bones. In contrast to secondary leukemias, secondary solid tumors most commonly occur 10 or more years after treatment. The risk of developing a secondary solid tumor is increased when radiation is delivered at high doses and over large fields to children at a young age.
- **People who have a history of cancer in their family.** Some cancer patients have inherited gene changes (mutations) that increase the chances of getting a second cancer. But overall, these inherited changes are relatively uncommon and account for less than 10 percent of patients with cancer. Doctors suspect the presence of a cancer gene when a family history shows multiple cancers among young people in every generation, or when cancer occurs in both sides of paired organs (such as the eyes, breasts, kidneys, etc.) If you have any questions or think that cancer may “run in your family” you should talk to your healthcare provider. A review of your family medical history will tell whether genetic counseling or testing is needed.

What should you do to decrease your risk and detect a subsequent cancer early?

Reviewing your cancer treatment and family history with your healthcare provider or cancer specialist is important to understand your risk for developing a subsequent cancer. Depending on your treatment and what cancer you may at risk of developing, early or more frequent screening for adult cancers such as color and breast may be recommended to promote early detection and treatment of subsequent cancers, when they are most likely to be cured. Be sure to get all screening tests that are recommended for you.

What monitoring is recommended?

By practicing health maintenance behaviors, you can improve your awareness of changes in your body and increase the likelihood that problems will be detected at earlier stages. *All childhood cancer survivors should have a yearly comprehensive health check-up.* You should also have any cancer screening evaluations appropriate for you based on your age, sex, and treatment history. *Knowing the details of your previous medical history, including exposures to chemotherapy, radiation, and surgery, is vital to your future health.* This information should be available to you or your healthcare provider from the hospital or clinic where you received your cancer therapy. Developing a relationship with a primary care provider who knows your cancer treatment history, risks of late complications, and recommended screening evaluations will improve the chances of catching problems at earlier, more treatable stages.

What symptoms should I be alert for?

Be sure to report any new or persistent symptoms to your healthcare provider promptly.

Symptoms that you should report include:

- Easy bruising or bleeding
- Excessive fatigue
- Changes in moles
- Lumps
- Changes in bowel habits
- Blood in the stools
- Persistent cough or hoarseness
- Bloody sputum
- Discolored areas or sores in the mouth that do not heal
- Persistent headaches
- Paleness of the skin
- Bone pain
- Sores that do not heal
- Difficulty swallowing
- Persistent abdominal pain
- Painful urination or defecation
- Shortness of breath
- Vision changes
- Persistent early morning vomiting

What can I do to lower the risk of getting a second cancer?

Avoid cancer-promoting habits. Survivors should not smoke, vape, or chew tobacco and should avoid exposure to secondhand smoke when at all possible. Because skin cancers are one of the most common second cancers after childhood cancer, especially for those treated with radiation therapy, you should take extra care to protect your skin from sun exposure. This includes regularly using sunscreen with sun protection factor (SPF) of 15 or more, wearing protective clothing, avoiding outdoor activities from 10 am to 2 pm when the sun's rays are most intense, and not tanning.

Drink alcohol only in moderation. Heavy drinkers, especially those who use tobacco, have a high risk of cancer of the mouth, throat, and esophagus. The risk of breast cancer may be increased in women who drink alcohol. Limiting the use of alcohol can reduce these cancer risks and decrease the chances of other alcohol-related problems, such as liver disease.

Eat healthy. A high intake of dietary fat has been linked to the risk of several common adult cancers. People who eat high-fat diets have a greater risk of getting colon cancer; this may also be true for breast and prostate cancers. High-fat diets are also associated with obesity, heart disease, and other health problems. To reduce all of these risks, daily fat intake should be limited to 30% or less of your total calories.

Dietary fiber is found in whole grains, several types of vegetables, and certain fruits. Fiber reduces the time it takes for waste to pass through the intestinal tract. High-fiber foods also tend to be low in fat.

Eating cruciferous vegetables also helps reduce cancer risk. Cruciferous vegetables include cabbage, Brussel sprouts, broccoli, and cauliflower. Eating these vegetables is thought to protect against cancer by blocking the effects of cancer-causing chemicals in other foods. Cruciferous vegetables are also high in fiber and low in fat. These foods should be included frequently in the diet.

Some chemicals used to preserve foods are cancer-promoting (carcinogenic) in large quantities. Diets high in salt-cured and pickled foods and lunchmeats that contain preservatives like nitrites can increase the risk of cancer in the stomach and esophagus. Some of these foods, especially lunchmeats, are also high in fat. Foods of this kind should be eaten rarely and in small portions.

Diets rich in vitamins C and A have been shown to reduce cancer risk in animal studies. People whose diets are rich in vitamin C appear less likely to get cancer, especially cancer of the stomach and esophagus. The best way to get these

nutrients is to eat lots of fresh fruits and vegetables. Citrus fruits, melons, cruciferous vegetables, and greens are high in vitamin C. Good sources of vitamin A are dark green and deep yellow vegetables and certain fruits. If your diet is low in vitamins, a vitamin supplement may help, but avoid extra high doses, since these can cause serious side effects.

Get vaccinated. Certain cancers are associated with preventable infections. Two of the most common are hepatitis B and human papillomavirus virus (HPV). Vaccines are now available to protect against these cancer-causing viruses. Check with your health care provider to determine if either of these vaccines is recommended for you.

Start today by taking time to review your health habits, and practice healthy behaviors that will help keep your risk of second cancers to a minimum.

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Additional health information for childhood cancer survivors is available at www.survivorshipguidelines.org

Note: Throughout this *Health Links* series, the term "childhood cancer" is used to designate pediatric cancers that may occur during childhood, adolescence, or young adulthood. Health Links are designed to provide health information for survivors of pediatric cancer, regardless of whether the cancer occurred during childhood, adolescence, or young adulthood.

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