Reducing the Risk of Second Cancers

Learning about the risk of developing a second cancer can be frustrating and anxiety provoking. After your battle with childhood cancer, the last thing you want to be reminded about is the risk of developing a second cancer during adulthood. For a variety of reasons, 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 second) 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 second cancer?

- **People who received certain chemotherapy drugs.** Some treatments for childhood cancer increase the risk of second cancers. Rarely, people can develop acute myeloid leukemia after treatment. Secondary leukemia usually occurs, if at all, within the first 10 years following treatment of the original cancer. The risk of developing a secondary leukemia is increased for people who were treated with high doses of alkylating agents (such as cyclophosphamide or nitrogen mustard), epipodophyllotoxins (such as etoposide or teniposide), and anthracycline chemotherapy drugs (such as doxorubicin or daunorubicin), and for those who received a hematopoietic cell transplant (HCT).

- **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, and bones. In contrast to secondary leukemias, secondary solid tumors most commonly appear 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 if you are in a high-risk group?

You can find out if you are at high risk for developing a second cancer by going over your cancer treatment and family history with your healthcare provider or a cancer specialist. In some cases, early or more frequent screening may be recommended to increase the likelihood that second cancers are detected early, when they are most effectively treated. 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.

Types of symptoms that you should report include:

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

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.

Written by Melissa M. Hudson MD and Allison Hester, RN, MSN, CPNP, After Completion of Therapy (ACT) Clinic, St. Jude Children’s Research Hospital, Memphis, TN. Portions adapted from CCSS Newsletter, Fall 1999 and Winter 2001, used with permission.

Reviewed by Smita Bhatia MD, MPH, Debra Friedman MD, Fran Wiley RN, MN, and Jill Meredith RN, BSN, OCN®.
Health Link
Healthy living after treatment for childhood cancer

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.

Disclaimer and Notice of Proprietary Rights
Introduction to Late Effects Guidelines and Health Links: The "Long-Term Follow-Up Guidelines for Survivors of Childhood, Adolescent, and Young Adult Cancers" and accompanying "Health Links" were developed by the Children's Oncology Group as a collaborative effort of the Late Effects Committee and Nursing Discipline and are maintained and updated by the Children's Oncology Group's Long-Term Follow-Up Guidelines Core Committee and its associated Task Forces.

For Informational Purposes Only: The information and contents of each document or series of documents made available from by the Children's Oncology Group relating to late effects of cancer treatment and care or containing the title "Long-Term Follow-Up Guidelines for Survivors of Childhood, Adolescent, and Young Adult Cancers" or the title "Health Link", whether available in print or electronic format (including any digital format, e-mail transmission, or download from the website), shall be known hereinafter as "Informational Content". All Informational Content is for informational purposes only. The Informational Content is not intended to substitute for medical advice, medical care, diagnosis or treatment obtained from a physician or health care provider.

To cancer patients (if children, their parents or legal guardians): Please seek the advice of a physician or other qualified health provider with any questions you may have regarding a medical condition and do not rely on the Informational Content. The Children's Oncology Group is a research organization and does not provide individualized medical care or treatment.

To physicians and other healthcare providers: The Informational Content is not intended to replace your independent clinical judgment, medical advice, or to exclude other legitimate criteria for screening, health counseling, or intervention for specific complications of childhood cancer treatment. Neither is the Informational Content intended to exclude other reasonable alternative follow-up procedures. The Informational Content is provided as a courtesy, but not intended as a sole source of guidance in the evaluation of childhood cancer survivors. The Children's Oncology Group recognizes that specific patient care decisions are the prerogative of the patient, family, and healthcare provider.

No endorsement of any specific tests, products, or procedures is made by Informational Content, the Children's Oncology Group, or affiliated party or member of the Children's Oncology Group.

No Claim to Accuracy or Completeness: While the Children's Oncology Group has made every attempt to assure that the Informational Content is accurate and complete as of the date of publication, no warranty or representation, express or implied, is made as to the accuracy, reliability, completeness, relevance, or timeliness of such Informational Content.

No Liability on Part of Children's Oncology Group and Related Parties: Agreement to Indemnify and Hold Harmless the Children's Oncology Group and Related Parties:

No liability is assumed by the Children's Oncology Group or any affiliated party or member thereof for damage resulting from the use, review, or access of the Informational Content. You agree to the following terms of indemnification: (i) "Indemnified Parties" include authors and contributors to the Informational Content, all officers, directors, representatives, employees, agents, and members of the Children's Oncology Group and affiliated organizations; (ii) by using, reviewing, or accessing the Informational Content, you agree, at your own expense, to indemnify, defend and hold harmless Indemnified Parties from any and all losses, liabilities, or damages (including attorneys' fees and costs) resulting from any and all claims, causes of action, suits, proceedings, or demands related to or arising out of use, review or access of the Informational Content.

Proprietary Rights: The Informational Content is subject to protection under the copyright law and other intellectual property law in the United States and worldwide. The Children's Oncology Group retains exclusive copyright and other right, title, and interest to the Informational Content and claims all intellectual property rights available under law. You hereby agree to help the Children's Oncology Group secure all copyright and intellectual property rights for the benefit of the Children's Oncology Group by taking additional action at a later time, action which could include signing consents and legal documents and limiting dissemination or reproduction of Informational Content.