

## Secondary Cancers

Having a secondary cancer means you have a second type of cancer after you've been treated for a first cancer – usually many years after. It is more common if you had your first cancer during your childhood or adolescence. For example, if someone was treated for Hodgkin lymphoma when they were 17 years old and then developed leukemia at age 40, the leukemia would be a secondary cancer. If the Hodgkin lymphoma had returned, it would be called a *recurrence*, not a secondary cancer.

Cancer treatments such as chemotherapy and radiation therapy kill cancer cells by damaging the genetic material (DNA) that controls the cell. It stops them from reproducing and the cancer cells die. However, the DNA of healthy cells may also be affected by treatment. In time, this damage may result in those cells becoming cancer cells. In the past, secondary cancers were primarily seen in those who had survived childhood cancer. Today, with more effective treatments, survivors of all cancers are living longer. As a result, more adults may face the possibility of a secondary cancer caused by treatment of a first cancer.

Some secondary cancers may develop for the same reasons as the first cancer. These reasons are called shared risk factors. We will focus on secondary cancers caused by previous cancer treatments.

### Chemotherapy

Past treatment with certain chemotherapy drugs\* has been associated with some second cancers. The cancers most often linked to chemo are myelodysplastic syndrome (MDS), acute myelogenous leukemia (AML), or acute lymphocytic leukemia (ALL). In addition to the type of drug given, risk also rises with higher doses, being treated for longer lengths of time, and receiving high doses in a short amount of time. Chemo is known to be a greater risk factor than radiation therapy in causing leukemia.

\*Chemotherapy associated with a higher risk of a second cancer include alkylating agents (ex: cyclophosphamide, carmustine, busulfan), platinum drugs (ex: cisplatin, oxaliplatin, carboplatin), and anthracycline topoisomerase II inhibitors (ex: etoposide, mitoxantrone).

### Radiation Therapy

Past radiation exposure can increase your risk for leukemia and myelodysplastic syndrome (MDS), a bone marrow cancer that can turn into acute leukemia. Risk of developing cancer depends on how much of the bone marrow was exposed to radiotherapy; how much radiation reached the bone marrow, the dose of radiation given, how quickly (or slowly) each dose was given, and how often the dose was given.

As an example: Hodgkin lymphoma was treated with stronger chemotherapy and higher radiation doses than used today. After this successful, but aggressive, treatment, second cancers included:

- leukemia (after chemo with alkylating agents)
- lung cancer (after radiation to the chest); breast cancer in women who have had radiation to the chest)
- thyroid cancer (after radiation to the neck), and colon cancer (after radiation to the colon)

It is difficult to predict if or when a second cancer may occur because we don't yet know exactly what causes second cancers. There are steps you can take to stay healthy as possible and lower your risk of a second cancer.

- ✓ Follow your [survivorship care plan](#) so your health can be monitored and any problems caught early. Care plans include when you need routine screenings and vaccinations. It is recommended you continue to be monitored in a survivorship program throughout your lifetime. If a survivorship program is not available in your area, choose a provider who is knowledgeable and experienced in the health needs of cancer survivors.
- ✓ **NO** tobacco products because they increase your risks for many types of cancer.
- ✓ Get to a healthy weight and stay there.
- ✓ Limit your time in the sun. Cover up and always wear sunscreen with SPF of 30 or higher. Do not use tanning beds.
- ✓ Sleep is very important to recovery and health. If you are having trouble falling asleep or you wake frequently, talk to your doctor. For more information, see [Sleeping Well for Cancer Survivors](#) from the CDC (Centers for Disease Control and Prevention).
- ✓ Good nutrition is also key during recovery. Focus your diet on lots of fruits and vegetables, healthy fats, lean proteins, and whole grains. Avoid highly processed foods and foods high in added sugar, and limit red meat.
- ✓ Stay active. Keep moving and limit the time you spend sitting or lying down.
- ✓ Avoid or limit alcohol. Women should not have more than 1 drink per day, men no more than 2 drinks per day.
- ✓ Find support when needed: Undergoing cancer treatments can be a very stressful time, both physically and emotionally and you may think survivorship would bring relief of fear and anxiety and bring routine and stability back into your life. However, it's also a period of adjustment and some people feel unsettled or a bit isolated when they see their Roswell providers less often. In addition, some find the monitoring tests and scans increases their anxiety and others find it difficult to change the way they view themselves. Life after treatment may include adjusting your daily schedule or coping with loved ones who want or expect you to move on and put it all behind you. You may find other cancer survivors a great resource for tips on handling readjustment issues. Roswell Park has an [online CancerConnect community](#) with a national survivorship group and also offers a [survivorship support group](#).

For more information about survivorship: The National Comprehensive Cancer Network (NCCN) offers [Guidelines for Patients: Survivorship Care for Healthy Living](#) and [Survivorship Care for Cancer-Related Late and Long-Term Effects](#)