

## Long-Term Side Effects of Cancer Treatment

This section has been reviewed and approved by the [Cancer.Net Editorial Board \[1\]](#), March / 2014

### Key Messages:

- Cancer treatments may cause long-lasting side effects, called late effects.
- The types of late effects a person experiences vary based on the cancer treatments he or she received.
- All cancer survivors should receive follow-up care after treatment to monitor and manage any late effects.

A late effect is a side effect that occurs months or years after cancer treatment. Many people who have received treatment for cancer have a risk of developing long-term side effects, and the evaluation for and treatment of these is an important part of survivorship care.

### Types of late effects

Nearly any type of treatment can cause late effects, and these are specific to the treatment you received. Some of the more common late effects are described below. If you are concerned about a particular late effect, please talk with your doctor.

#### Problems from surgery.

- Survivors of Hodgkin lymphoma, especially those diagnosed before 1988, often had their spleens removed, and they have a higher risk of serious infections because of the spleen's role in the body's immune system.
- Survivors of cancers of the bone and soft tissue may experience physical and psychological effects from losing all or part of a limb, such as phantom limb pain (feeling pain in the limb that was removed). Learn more about [rehabilitation \[2\]](#), which can help people cope with physical changes from surgery.
- Cancer survivors who had surgery to remove the tiny, bean-shaped organs that help fight infection (lymph nodes) or radiation therapy to lymph nodes may develop [lymphedema \[3\]](#), an abnormal buildup of lymph fluid that causes swelling and pain.
- Men who had lymph nodes near the kidney, bladder, testicles, or rectum removed may not be able to have children, called infertility.

**Heart problems.** These are most often caused by radiation therapy to the chest and chemotherapy, especially if the drugs doxorubicin (Adriamycin) and cyclophosphamide (Cytoxan, Neosar) were used. People 65 or older and those who received higher doses of chemotherapy have a higher risk of heart problems, which may include swelling of the heart muscle, problems with the heart's ability to pump blood (congestive heart failure), or heart disease.

Talk with your doctor about having regular evaluations for heart damage if you have had these types of treatment because you may not experience any signs or symptoms. Screening tests to find heart damage include physical examinations and an [electrocardiogram \(EKG or ECG\) and echocardiography \(also known as an echo\) \[4\]](#). All cancer survivors, especially those who received treatment for Hodgkin lymphoma as children, should tell their doctor if they have chest pain, because this may be a sign of a heart problem.

**Lung problems.** Chemotherapy and radiation therapy to the chest may damage the lungs. Cancer survivors who received both chemotherapy and radiation therapy may have a higher risk of lung damage. Some of the drugs that are more likely to cause lung damage include bleomycin (Blenoxane), carmustine (BiCNU), prednisone (multiple brand names), dexamethasone (multiple brand names), and methotrexate (multiple brand names). The late effects may include the following:

- A change in how well the lungs work
- Thickening of the lining of the lungs
- Inflammation of the lungs
- Difficulty breathing

People with a history of lung disease and older adults may have additional lung problems.

**Endocrine (hormone) system problems.** Some types of cancer treatments may affect the endocrine system, which includes the glands and other organs that are responsible for making hormones and producing eggs or sperm.

For example, surgical removal of a woman's ovaries (oophorectomy), chemotherapy, hormone therapy, and radiation therapy to the pelvic area may cause a woman to stop menstruating (menopause) or menopausal symptoms. The symptoms of menopause caused by cancer treatment may be worse than the symptoms of natural menopause because the decrease in hormones happens quickly. Learn about [managing menopausal symptoms \[5\]](#)

Women undergoing hormone therapy who have not been through menopause may have lighter and fewer regular menstrual periods, or their menstrual periods may stop completely. Menstrual periods may return for some younger women after treatment, but women older than 40 are less likely to have their menstrual periods return. And, in some cases, although cancer treatment does not immediately cause menopause, it may still cause menopause to start sooner than normal.

In addition, men with prostate cancer who receive hormone therapy or who have their testicles removed may experience symptoms similar to menopause. Learn more about [managing hormone deprivation symptoms in men](#) [6].

Men and women who receive radiation therapy to the head and neck area may have lower levels of hormones or changes to the thyroid gland, and both men and women who undergo treatment that affects the endocrine system are at risk of temporary or permanent infertility from cancer treatment. Learn more about fertility concerns and ways to preserve fertility for treatment [men](#) [7] and [women](#) [8].

Cancer survivors who have a risk of hormone changes from treatment should have regular blood tests to measure hormone levels.

**Bone, joint, and soft tissue problems.** Cancer survivors who received chemotherapy, steroid medications, or hormonal therapy, particularly those who are not physically active, may develop thinning of the bones (osteoporosis) or joint pain.

Cancer survivors can lower their risk of osteoporosis by avoiding [tobacco products](#) [9], eating foods rich in calcium and vitamin D, participating in regular [physical activity](#) [10], and limiting the amount of [alcohol](#) [11] they drink. Learn more about [managing osteoporosis](#) [12].

**Brain, spinal cord, and nerve problems.** Chemotherapy and radiation therapy can cause long-term side effects to the brain, spinal cord, and nerves. These late effects include:

- Hearing loss from high doses of chemotherapy, especially drugs like cisplatin (Platinol)
- Increased risk of stroke for those who had high doses of radiation treatment to the head, usually to treat a brain tumor
- [Nervous system side effects](#) [13], such as damage to the nerves outside the brain and spinal cord ([peripheral neuropathy](#) [14])

Cancer survivors should undergo regular physical examinations, hearing tests, and x-rays after chemotherapy or radiation therapy ends to check for these late effects.

**Learning, memory, and attention difficulties.** Chemotherapy and high doses of radiation therapy to the head may cause these problems for both adults and children. Cancer survivors who experience any of these problems should talk with their doctor. Learn more about [cognitive problems](#) [15].

**Dental and oral health and vision problems.** Cancer survivors may have the following [dental and oral health](#) [16] and vision problems, depending on the treatments they received:

- Chemotherapy may affect tooth enamel and increase the risk of long-term dental problems.
- High-dose radiation therapy given to the head and neck area may change tooth development, cause gum disease, and lower saliva production, causing a dry mouth.
- Steroid medications may increase the risk of eye problems such as a clouding of the eye that affects vision (cataracts).

Cancer survivors should schedule regular appointments with a dentist and a doctor who specializes in treating eye conditions (ophthalmologist) to monitor these potential late effects.

**Digestion problems.** Chemotherapy, radiation therapy, and surgery may affect how well a person digests food. In addition, surgery or radiation therapy to the abdominal area can lead to tissue scarring, long-term (chronic) pain, and intestinal problems that affect digestion. Moreover, some survivors may have chronic diarrhea that reduces the body's ability to absorb nutrients. A nutritionist or dietitian may help treat people who are not getting enough nutrients or who are underweight because of poor digestion.

**Emotional difficulties.** Cancer survivors often experience a variety of positive and negative emotions, including relief, a sense of gratitude to be alive, [fear of recurrence](#) [17], [anger](#) [18], [guilt](#) [19], [depression](#) [20], [anxiety](#) [21], and isolation. Cancer survivors, caregivers, family, and friends may also experience [post-traumatic stress disorder](#) [22], an anxiety disorder that may develop after experiencing an extremely frightening or life-threatening situation.

Each person's post-treatment experience is different. For example, some survivors struggle with negative emotional effects of the cancer while others say that they have a [renewed, positive outlook on life](#) [23] because of the cancer.

**Secondary Cancers.** A secondary cancer, either a new primary cancer (a different type of cancer) that develops after treatment for the first type of cancer or cancer that has spread to other parts of the body from the place where it started, may develop as a late effect of previous cancer treatments, such as chemotherapy and radiation therapy. Chemotherapy and radiation therapy can also damage bone marrow stem cells and increase the chance of either [myelodysplasia](#) [24], which is a blood cancer where the normal parts of the blood are either not made or are abnormal, or [acute leukemia](#) [25]. Talk with your doctor about ways to lower the risk of a secondary cancer and the signs or symptoms to watch for.

**Fatigue.** Fatigue is a persistent feeling of physical, emotional, or mental tiredness or exhaustion. It is the most common side effect of cancer

treatment, and some cancer survivors experience fatigue for months and sometimes years after finishing treatment. Learn more about [cancer-related fatigue](#) [26].

### Questions to ask the doctor

Learn as much as you can about the potential long-term effects of your cancer treatment from your oncologist. In fact, you may want to schedule a special appointment to review your treatment summary, which should include information about your cancer, cancer treatment, and follow-up care.

ASCO offers [cancer treatment summary forms](#) [27] to store this information.

Consider asking your doctor the following questions:

- Would you or someone in your office write down which treatment(s) I received?
- Am I at risk for specific late effects?
- What other specialists (such as a cardiologist or endocrinologist) should I see to monitor potential late effects?
- Should I watch for any signs or symptoms of late effects?

### More Information

[Survivorship](#) [28]

[Fear of Treatment-Related Side Effects](#) [29]

[Side Effects](#) [30]

### Additional Resource

[LIVESTRONG: Late Effects of Cancer Treatment](#) [31]

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#### Links:

- [1] <http://www.cancer.net/about-us>
- [2] <http://www.cancer.net/node/25397>
- [3] <http://www.cancer.net/node/25250>
- [4] <http://www.cancer.net/node/24509>
- [5] <http://www.cancer.net/node/25257>
- [6] <http://www.cancer.net/node/25254>
- [7] <http://www.cancer.net/node/25268>
- [8] <http://www.cancer.net/node/29096>
- [9] <http://www.cancer.net/node/25002>
- [10] <http://www.cancer.net/node/24967>
- [11] <http://www.cancer.net/node/24981>
- [12] <http://www.cancer.net/node/29711>
- [13] <http://www.cancer.net/node/25258>
- [14] <http://www.cancer.net/node/24588>
- [15] <http://www.cancer.net/node/25044>
- [16] <http://www.cancer.net/node/24499>
- [17] <http://www.cancer.net/node/25241>
- [18] <http://www.cancer.net/node/24489>
- [19] <http://www.cancer.net/node/24491>
- [20] <http://www.cancer.net/node/30346>
- [21] <http://www.cancer.net/node/30336>
- [22] <http://www.cancer.net/node/24650>
- [23] <http://www.cancer.net/node/24649>
- [24] <http://www.cancer.net/node/19381>
- [25] <http://www.cancer.net/node/19065>
- [26] <http://www.cancer.net/node/25048>
- [27] <http://www.cancer.net/node/25394>
- [28] <http://www.cancer.net/node/22>
- [29] <http://www.cancer.net/node/24492>
- [30] <http://www.cancer.net/node/25238>
- [31] <http://www.livestrong.org/we-can-help/healthy-living-after-treatment/late-effects-of-cancer-treatment/>