



INTEGRATIVE ONCOLOGY  
Professional  
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GUIDES

# Common Side Effects of Chemotherapy & Radiation Treatment

PLUS CONSIDERATIONS FOR CANCER SURVIVORS

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CREATE AN ENVIRONMENT WHERE CANCER CANNOT THRIVE

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# Common Side Effects of Chemotherapy & Radiation Treatment

## **ANEMIA**

A common side effect of chemotherapy, anemia is a condition where the body has too little hemoglobin contained in red blood cells to carry oxygen to the rest of the body. Symptoms include fatigue, dizziness, paleness, a tendency to feel cold, shortness of breath, weakness, and racing heart.

## **APPETITE CHANGES, EATING PROBLEMS, AND WEIGHT LOSS**

Chemotherapy can cause nausea, taste changes, or mouth and throat problems that make it difficult to eat. Radiation to the head and neck or parts of the digestive system may lead to difficulty eating and digesting.

Loss of appetite, as well as weight loss, may result directly from effects of the cancer on the body's metabolism. Appetite loss may also be related to other side effects, such as depression or fatigue.

## **COAGULOPATHIES, BLEEDING OR CLOTTING PROBLEMS**

Chemotherapy can affect the bone marrow's ability to make platelets that help stop bleeding. Patients without enough platelets (thrombocytopenia) may bleed or bruise more easily than usual, even from a minor injury.

Severe thrombocytopenia can lead to a life-threatening hemorrhage, such as in the brain or gastrointestinal tract. Some targeted therapy drugs can increase the risk of bleeding as well as the risk of the formation of serious blood clots, such as strokes and clots that form in the veins of the legs (deep vein thrombosis).

## **COGNITIVE CHANGES, MEMORY AND THINKING PROBLEMS**

Chemotherapy and radiation to the brain can affect the cognitive (thinking) functions of the brain, including concentration, memory, comprehension, and reasoning. These changes are often subtle.

## **CONSTIPATION**

Some chemotherapy drugs and pain medications can cause constipation. Constipation may also result from changes in diet and/or activity level.

## **DERMATOLOGIC CHANGES**

Some chemotherapy and targeted therapy drugs may cause skin problems, including color changes, redness, itching, peeling, dryness, rashes, and acne. Some drugs can cause redness and pain of the palms and soles, which can worsen to blistering, peeling, and open sores, known as handfoot syndrome. Other drugs make skin more sensitive to the sun.

Most chemotherapy-related skin problems go away, but a few require immediate attention. Certain drugs can cause long-term tissue damage if they leak out of an IV. Symptoms of an allergic reaction, including sudden or severe itching, rash, or hives, should be reported right away.

Radiation may cause skin to become red, irritated, and swollen, worsening to become blistered, peeling, or developing open sores. As radiation damage heals, the skin in treatment areas may appear tanned. After a few weeks, skin may become dry, flaky, itchy, or peel. Most skin reactions to radiation slowly go away after treatment; however, skin in the treatment area may remain darker than it was before.

## **DIARRHEA**

Chemotherapy can cause diarrhea by affecting the cells lining the intestine. Radiation to the stomach, abdomen, or pelvis can also cause diarrhea.

## **DYSPNEA AND SHORTNESS OF BREATH**

Radiation to the chest and certain chemotherapy drugs can damage the lungs, causing shortness of breath. It may also occur as a result of chemotherapy-induced anemia.

## **FATIGUE**

Ranging from mild lethargy to feeling completely exhausted, fatigue is one of the most common side effects of cancer treatment. It is different from feeling tired after a long day and often does not get better with rest or sleep. Fatigue tends to be the worst at the end of a treatment cycle.



## **HAIR CHANGES**

Chemotherapy can cause hair loss (alopecia) on all parts of the body, not just the scalp, whereas hair loss resulting from radiation is limited to the specific area of treatment. Not all chemotherapy drugs cause hair loss. For most patients hair grows back after treatment, but it may be thinner, darker, or a different texture than it was before treatment. Some targeted therapies can cause hair to change colors and may also cause facial hair to grow faster than usual, including longer, thicker eyelashes.

## **IMMUNE SUPPRESSION**

Chemotherapy and radiation therapy can suppress or weaken the immune system by lowering the number and/or effectiveness of white blood cells (especially neutrophils) and other immune system cells. A weakened immune system results in an increased risk of infection.

## **INFERTILITY**

For men, chemotherapy can reduce the number and quality of sperm, which may result in short or long-term infertility. Chemotherapy can also cause infertility in women. Whether this happens and how long it lasts depends on many factors, including the type of drug, the doses given, and the age of the patient. Radiation to the pelvis can also affect fertility.

## **MOUTH, GUM, AND THROAT PROBLEMS**

Chemotherapy and radiation to the head and neck can cause painful sores in the mouth and throat. It can make these areas dry and irritated or cause the sores to bleed. This can interfere with the intake of food and even liquids, leading to malnutrition and dehydration. Mouth sores are not only painful, but there is also concern of infection that may spread to other parts of the body. Some chemotherapy drugs can also cause short-term problems with the nerves in the throat, which can lead to pain with swallowing, especially food or liquids of extreme temperature.

## **MYELOSUPPRESSION**

Sequela of chemotherapy-induced myelosuppression include anemia, which causes fatigue; thrombocytopenia, which causes increased bleeding (especially in the presence of age-related vessel fragility); and neutropenia, which increases the risk of potentially fatal infections, with the degree of that risk related directly to the severity and duration of the neutropenia.

## **NAUSEA AND VOMITING**

These symptoms may start during chemotherapy treatment and last a few hours. Less often, severe nausea and vomiting can last for a few days. Some people getting chemotherapy feel queasy even before treatment begins; this conditioned response is called anticipatory nausea and is linked to poorly controlled nausea in previous treatment cycles. Radiation to certain regions of the body can also cause nausea or vomiting.

## **NEUROPATHY**

Certain chemotherapy drugs can cause peripheral neuropathy, a potentially serious nerve problem that causes tingling, pins and needles, burning sensations, weakness, and/or numbness in the hands and feet.

## **SEXUAL PROBLEMS**

Chemotherapy and radiation to the pelvis can result in loss of libido, erectile dysfunction, vaginal dryness and narrowing (leading to painful intercourse), and vaginal infections. Some sexual side effects can remain after treatment.

## **URINARY BLADDER AND RENAL PROBLEMS**

Some chemotherapy drugs can irritate the bladder or cause kidney damage. They may also cause the urine to change color (orange, red, green, or yellow) or have a strong or medicine-like odor. Radiation to the pelvis can also irritate the bladder and lead to painful or frequent urination, which can become a chronic problem.

## **WEIGHT GAIN AND WEIGHT LOSS**

Chemotherapy can cause some people to gain weight, which may be due to inactivity, electrolyte imbalances, fluid retention, or corticosteroids contained in the drug regimen. Weight loss can result from nausea and vomiting and anorexia as well as disruption of normal digestive and absorptive functions.



# Considerations for Cancer Survivors

## AND CANCER AS A CHRONIC ILLNESS

### IMPAIRMENT-DRIVEN CANCER REHABILITATION

Physical and mental impairments may significantly reduce survivors' ability to function, resulting in disability and poor quality of life.

There are hundreds of different impairments that survivors may develop due to preexisting medical problems, the cancer itself, or cancer treatment.

Examples of these include **muscular weakness or paralysis, swallowing or speech problems, lymphedema, rotator cuff impingement, and physical disability as a result of major surgery.**

Although general exercise and behavioral interventions are important and contribute to the overall health and wellbeing of survivors, they should not be confused with impairment-driven cancer rehabilitation.

This intervention focuses on the diagnosis and treatment of specific cognitive and physical problems that are best addressed by qualified rehabilitation health care professionals such as physiatrists (doctors that specialize in rehabilitation medicine) and physical, occupational, and speech therapists.

It is important to identify preexisting problems shortly after diagnosis and identify worsening or new issues all along the care continuum.

It is very common for survivors to have multiple impairments, and these should be treated with an interdisciplinary rehabilitation approach.

### SEXUAL DYSFUNCTION

Sexual problems after cancer treatment affect survivors of many different cancers, including breast, bladder, colorectal, prostate, and gynecological.

Treatments that have a high rate of sexual side effects include **surgery or radiation to the pelvic area, high-dose chemotherapy, aromatase inhibitors in women, and hormone therapies in men.**

Most sexual problems are caused by physical damage to nerves and blood vessels or hormonal changes that result in the loss of sexual desire, erection problems in men, and vaginal dryness and pain during sex in women.

These sexual problems can be severe and tend not to be resolved unless specific treatments, including medical therapies and counseling, are provided. For people in a relationship, including the partner in treatment is crucial.

After the completion of treatment, 20% to 30% of breast cancer survivors and nearly 80% of prostate cancer survivors report sexual difficulties.

### PALLIATIVE CARE

Palliative or supportive care can provide better quality of life for cancer patients and their families by focusing on relieving the pain, stress, and other symptoms associated with cancer and its treatment.

Oncologists may provide palliative care as part of cancer treatment or request assistance from a specialized palliative care team. This team may include specially trained doctors, nurses, chaplains/ spiritual counselors, and social workers. Pharmacists, nutritionists, massage therapists, and others may also be part of the team.

Palliative care is appropriate at any stage of cancer diagnosis and can be provided continuously alongside curative treatment.

Palliative care is provided in a variety of settings, including hospitals and community cancer centers where patients and survivors frequently receive care, and may also be available in long-term care facilities, through hospice, and even in the home.



**Palliative care has been consistently shown to improve quality of life** by addressing the harmful effects of pain, other physical symptoms, and emotional distress. It has also been shown to improve survival in some cancer patients and reduce caregiver burden.

**For more information:**

[acscan.org/qualityoflife](http://acscan.org/qualityoflife)  
[patientqualityoflife.org](http://patientqualityoflife.org)  
[cancer.org/ treatment/treatmentsandsideeffects/palliativecare](http://cancer.org/treatment/treatmentsandsideeffects/palliativecare)  
[getpalliativecare.org](http://getpalliativecare.org)

## THE RECOVERY PHASE

After primary, curative treatment ends, most cancer patients transition to the recovery phase of survivorship.

Challenges during this time may include difficulty returning to former roles such as parent or employee, anxiety about paying medical bills for cancer treatment, or decisions about which provider to see for the various health care needs that arise.

Family and friends who went out of their way to provide support during treatment typically return to more normal levels of engagement and support, and the frequency of meetings with the cancer care team generally declines.

**These issues can make it difficult to smoothly negotiate the transition from treatment to recovery.**

Regular medical care following primary treatment is particularly important for cancer survivors because of the potential lingering effects of treatment, as well as the risk of recurrence and additional cancer diagnoses.

This is why IOM recommended that patients and their primary care providers be given a summary of their treatment and a comprehensive survivorship care plan developed by one or more members of the oncology team.

## THE SURVIVORSHIP CARE PLAN

**The Comprehensive Treatment Summary**, which provides a foundation for the plan, contains the following personalized, detailed information:

- Type of cancer, stage, and date of diagnosis
- Specific treatment and dates (e.g., names of surgical procedures, chemotherapy drug names and dosages, radiation dosages, etc.)
- Complications (side effects of treatment, hospitalizations, etc.)
- Supplemental therapy (e.g., physical therapy, adjuvant therapy, such as tamoxifen, etc.)

**The Survivorship Care Plan** should be tailored to address each individual's specific needs.

In addition to the treatment summary, the plan may include:

- A schedule of follow-up medical visits, tests, and cancer screenings, including who will perform them and where
- Symptoms that may be a sign of cancer recurrence
- Potential long-term treatment effects and their symptoms
- Behavior recommendations to promote a healthy recovery
- Community resources

Palliative care is a rapidly growing medical specialty, but unfortunately these services are not yet available to all who need them.

In 2006, the Institute of Medicine's Committee on Cancer Survivorship published a report highlighting the need to improve coordination of ongoing care for survivors.

A recent study found that only 20% of oncologists consistently provide survivorship care plans to their patients.



**Early studies have found that survivorship care plans help survivors feel more informed, make healthier diet and exercise choices, and increase the likelihood that patients will share this information with their health care team members.**

Studies are also evaluating the short and long-term benefits of survivorship care plans on health outcomes, health behaviors, and health care coordination.

However, there are numerous obstacles to the implementation of survivorship care plans in the current health care system, such as lack of compensation for the time and effort to create the plan, shortage of time to develop and discuss the plan with the patient, and lack of clarity about who is responsible for their production.

As a result, many survivors do not receive this information.

Source: Cancer Treatment & Survivorship Facts & Figures 2014-2015

<http://www.cancer.org/acs/groups/content/@research/documents/document/acspc-042801.pdf>

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