



Long-term side effects of radiation therapy

are less common than short-term,
but it helps to be aware
of their possibility.

All of the various forms of cancer share a common characteristic: cells that have begun to divide quickly and grow out of control. Radiation therapy is a form of treatment where technicians direct high-energy rays or particles to the specific areas of the body containing these fast-growing cancer cells. The goal is to cause enough damage to these cells to slow or stop the process of division, thereby significantly shrinking, or even eliminating the tumor.

Of course, radiation can also damage any healthy cells in the vicinity, although the targeted nature of radiation therapy helps limit the amount of healthy tissue affected. Side effects from radiation therapy are common during and right after treatment, but long-term effects can also arise, even years down the road.

The type of longer-term side effects the therapy may cause depends on:

- The area of the body receiving radiation
- The size of area being treated
- The total dose of radiation
- The number of treatments

Radiation to the chest area, for example, may affect the lungs or heart. In some people this may cause scarring, which can affect their capacity for physical activity in the future. Radiation to the abdomen or pelvis can lead to bladder, bowel, or sexual problems in some people. Radiation in certain areas can also lead to lymphedema – a condition resulting in fluid buildup and swelling in an arm or leg.

Radiation and Risk of Future Cancers

Many people are concerned that radiation might increase their risk of getting a second cancer at some time in the future. This increase is small, but real.

The link between radiation and cancer was noted many years ago in studies of atomic bomb survivors, workers exposed to radiation on the job, and patients treated with radiation therapy. One study, for example, found that young women given whole body radiation as treatment for Hodgkin disease were more likely to develop breast and other cancers later in life. (Whole body radiation treatment is no longer common.)

Some cases of leukemia are related to radiation exposure. They usually develop within a few years of exposure, peaking at five to nine years, and then slowly declining. The development of other types of cancer after radiation exposure has been shown to take much longer to occur. Most do not occur until at least 10 years after radiation exposure, and some are diagnosed 15 or more years later.

Improved Radiation Techniques

Radiation therapy techniques have steadily improved over the past few decades. Treatments now target the cancer more

precisely and more is known about selecting radiation doses. These advances are expected to reduce the number of second cancers resulting from radiation therapy.

Some Side Effects Have a Late Onset

People with cancer often receive radiation treatments five days a week for two to nine weeks.

Side effects typically start around the second or third week of treatment and peak about two-thirds of the way through treatment. After treatment ends, most side effects last only two or three more weeks. Some, however, may last longer and some others may not begin for several months.

Below are some side effects that might occur more than 90 days after treatment:

Treated Area	Side Effects
Brain, spinal column	Headache, tiredness
Tongue, voice box, tonsils, salivary glands, nasal cavity, pharynx	Dry mouth, damage to jaw bone, lockjaw, changes in taste and smell
Lung, esophagus, breast	Narrowing of esophagus, chest pain on exertion, heart enlargement, inflammation of pericardium, lung scarring or inflammation
Large or small intestine, prostate, cervix, uterus, rectum, pancreas	Diarrhea, blood in urine, bladder irritation

Weighing Risk Against Reward

Because long-term side effects from radiation treatment are relatively uncommon and because the risk of second cancers is generally low, risk must be weighed against the important benefits gained with radiation treatments.

Discuss both risks and benefits with your doctor and cancer care team. This can help you make an informed treatment decision and help you be aware of symptoms to watch out for after treatment.

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