

Possible Side Effects

OF RADIATION FOR LUNG CANCER

Side effects are different for everyone. Some patients feel fine during treatment while others may feel uncomfortable.

- **Mild tiredness** may develop. However, tiredness from radiation should improve within a few weeks after radiation treatment ends.
- **Skin irritation** may occur with external beam radiation. Clean the area regularly with mild soap and warm water.
- **Shortness of breath or cough** may be temporary or permanent depending on your cancer and its treatment.
- **Difficulty or pain when swallowing** may develop that will get better a few weeks after treatment is finished.
- **Loss of chest hair** may occur but only in the area being treated.

Very rare long-term potential side effects include rib fracture or a second cancer from the radiation treatment.

Some side effects can be controlled with medications and changes to your diet. Ask your doctor or nurse whether you should make any changes in your diet. Tell them if you experience any discomfort so they can help you feel better.

Visit www.rtanswers.org to download a complete chart of side effects.

Side effects of Lung Cancer Treatment		
Organ System	Acute Complications (Days-Months After Treatment)	Late Complications (Months-Years After Treatment)
General	Fatigue	Fatigue Secondary cancers caused by radiation (Extremely rare)
Skin	Irritation	Darkening/turning over treated area
Lungs	Shortness of breath Cough	Shortness of breath Lung inflammation (often not requiring treatment, but visible on imaging) Chest wall discomfort Rib fracture (Extremely rare)
Throat	Soreness or pain when swallowing	Narrowing of the esophagus causing difficulty swallowing
Digestive	Nausea	

HELPFUL WEBSITES ON LUNG CANCER

American Lung Association
www.lung.org

Lungcancer.org
www.lungcancer.org

Lung Cancer Alliance
www.lungcanceralliance.org

Lung Cancer Online
www.lungcanceronline.org

Radiation Therapy Answers
www.rtanswers.org



ABOUT THE RADIATION ONCOLOGY TEAM

Radiation oncologists are cancer doctors who also oversee the care of each patient undergoing radiation treatment. Other members of the radiation oncology team include radiation therapists, radiation oncology nurses, medical physicists, dosimetrists, social workers and nutritionists. To locate a radiation oncologist in your area, visit www.rtanswers.org.

ABOUT ASTRO

The American Society for Radiation Oncology is the premier radiation oncology society in the world with more than 10,000 members who specialize in treating cancer with radiation therapies. ASTRO's mission is to advance the practice of radiation oncology by promoting excellence in patient care, promoting research and disseminating research results. Visit www.astro.org for more information.

LEARNING ABOUT CLINICAL TRIALS

The medical profession is always looking for new ways to treat and cure cancer through studies called clinical trials. Today's lung cancer radiation therapy treatments are the result of clinical trials completed in the past proving that radiation therapy kills cancer cells and is safe long term. For more information on clinical trials, ask your doctor or visit: www.cancer.gov/clinicaltrials.

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ASTRO
TARGETING CANCER CARE

Radiation Therapy for Lung Cancer



Lung cancer is the second most common cancer in men and women, it is the number one cause of death from cancer each year in both men and women. According to the American Cancer Society, 224,210 Americans will be diagnosed with lung cancer this year. Cigarette smoking is the most common cause of lung cancer. Exposure to asbestos, radon, environmental factors and secondhand smoke can also cause lung cancer.

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TYPES OF LUNG CANCER

There are two main types of lung cancer, **non-small cell lung cancer** and **small cell lung cancer**. These names refer to how a cancer looks under the microscope.

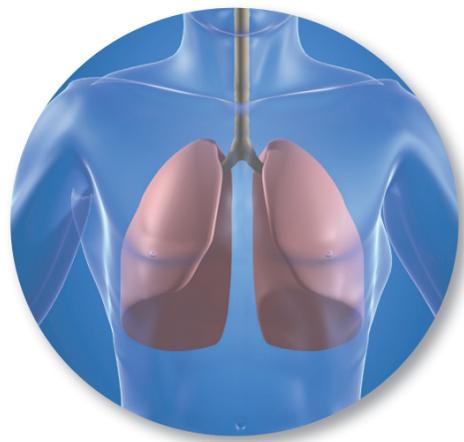
Non-small cell lung cancer is the most common type of lung cancer and accounts for 84 percent of cases. There are different types of non-small cell lung cancer, including:

Adenocarcinoma - a cancer that forms in the outer parts of the lung.

Squamous cell carcinoma - a cancer that forms from a cell lining the airway.

Large cell carcinoma - a kind of non-small cell lung cancer, but the cell it starts from may not be known.

Small cell lung cancer is less common and accounts for 14 percent of cases. Although the cells are small, they multiply quickly and can form large tumors that may spread throughout the body. This type of lung cancer is almost always due to smoking.



TREATING LUNG CANCER

Lung cancer treatment depends on several factors, including the type and stage of the lung cancer and your overall health.

Radiation Therapy

Radiation is a high-energy X-ray that can be used to treat lung cancer noninvasively. It passes through the chest to treat lung cancer and can be combined with surgery, chemotherapy or both depending upon the circumstances. Radiation therapy works within cancer cells by damaging their ability to multiply. When these cells die, the body naturally eliminates them.

In early-stage lung cancer, surgery has been the standard. However, in patients medically not able to tolerate surgery, focused radiation, called stereotactic body radiation therapy (SBRT) is a good treatment option. For large tumors or those involving lymph nodes, radiation (often combined with chemotherapy) may replace surgery as the main treatment. For more advanced cancers, your doctors may recommend radiation to manage symptoms such as cough, shortness of breath or pain

Medical Therapy

Medical oncologists specialize in treating lung cancer using various drugs. Chemotherapy means drug treatment, but there are many different kinds of medications that can be used to treat lung cancer. New research is helping oncologists learn which drugs may be most effective, and the side effects differ for each one. Often, chemotherapy is combined with radiation therapy to make the radiation more effective. However, such combined treatment (chemoradiation) can also increase the side effects of treatment. Ask your medical oncologist about what drugs may be best for you.

Surgery

Surgery is often a key part of lung cancer care. Even before treatment, surgery may be helpful in diagnosis and finding whether the cancer has spread to lymph nodes in the chest. This type of surgery is part of tumor staging, or understanding how advanced the cancer may be.

In early-stage tumors, surgery by itself can be curative. Your surgeon may remove part of the lung around the cancer. The amount of lung removed will vary based upon location, your health and other factors. If there are no signs of spread, additional treatment is often not needed.

In more advanced tumors, surgery is sometimes replaced by radiation and chemotherapy or can be combined with these treatments. Ask your surgeon or other doctors whether your tumor is early or advanced and whether surgery will be helpful for you.

EXTERNAL BEAM RADIATION THERAPY

External beam radiation therapy (also called radiotherapy) is the safe delivery of high-energy X-rays to your cancer. A **linear accelerator** focuses the radiation beam to a precise location in your body for an exact period of time. Radiation is given in a series of daily treatments, Monday through Friday, for several weeks. In small cell lung cancer, two treatments may be given each day. The full course of treatment varies but can span three to seven weeks.

Before beginning treatment, you will be scheduled for a planning session to map out the treatment area. This procedure is called a **simulation**. You will undergo a **CT scan** to design your treatment and small tattoos will be made on the skin to make sure your treatments are accurate.

Different techniques can be used to give radiation for lung cancer.

- **Three-dimensional conformal radiotherapy (3-D CRT)** combines multiple radiation treatment fields to deliver precise doses of radiation to the lung tumor. Radiation oncologists are able to tailor each of the radiation beams to focus on the tumor while protecting nearby healthy tissue.
- **Intensity modulated radiation therapy (IMRT)** is a specialized form of 3-D CRT that modifies the radiation by varying the intensity of each radiation beam. IMRT is still being studied for lung cancer.

- **Stereotactic body radiation therapy (SBRT)** is a specialized form of radiation that delivers high doses of radiation to small and very precisely defined targets over a shortened course of therapy, usually in five treatments or less.
- **Proton beam therapy** is a type of external beam radiation therapy that uses proton beams rather than X-rays, which can give less radiation to normal tissue. The benefits of proton beam therapy over other external beam radiation therapies are still being studied.

CARING FOR YOURSELF DURING TREATMENT

Cancer treatment can be difficult. You have many issues to cope with. Your oncology team along with family and friends are available to help.

- Get plenty of rest during treatment, and don't be afraid to ask for help.
- Follow your doctor's orders. Your doctor may ask you to call if you develop a fever of 101° F or higher.
- Ask if you are unsure about anything. There are no stupid questions.
- Tell your doctor about any medications, vitamins or supplements you are taking to make sure they are safe to use during radiation therapy.
- Nutrition is important. Eat a balanced diet. Let your doctor know if you have trouble swallowing, food tastes funny or you have trouble eating.
- Treat the skin exposed to radiation with special care. Wear a shirt when you're in the sun, avoid hot or cold packs, only use lotions and ointments after checking with your doctor or nurse, and clean the area with warm water and mild soap.