The lymphatic system is a network of tiny vessels extending throughout the body. Scattered along these vessels are lymph nodes, which are often adjacent to arteries and veins. The lymphatic vessels carry a clear fluid called lymph from the extremities and organs back to the heart for circulation. The primary job of the lymphatic system is to fight infection and disease. A tumor of the lymphatic system is called lymphoma. There are two main types: Hodgkin Lymphoma and non-Hodgkin Lymphoma.
HODGKIN LYMPHOMA

- Hodgkin Lymphoma accounts for 10% of all lymphomas diagnosed in the United States, with the majority of presentations occurring in two age groups: 15-30 years of age and then another in adults 55 years or older.
- An estimated 8,500 people will be diagnosed with Hodgkin Lymphoma in the United States this year.
- Hodgkin Lymphoma is now curable in at least 80% of patients.
- Depending on the stage, the primary treatment approach for this lymphoma is typically a combination of chemotherapy and radiation therapy.

NON-HODGKIN LYMPHOMA (NHL)

- Non-Hodgkin Lymphoma is a broad term that encompasses a diverse group of lymphomas that differ from Hodgkin Lymphoma. The most common subtypes diagnosed in the United States include: diffuse large B-cell lymphoma (DLBCL), chronic lymphocytic leukemia/small lymphocytic lymphoma (CLL/SLL), follicular lymphoma, marginal zone lymphoma, and mantle cell lymphoma.
- NHL is nine times more common than Hodgkin Lymphoma, with an estimated 77,240 people diagnosed this year.
- All types of NHL are treatable, and many are curable. NHL is typically treated with chemotherapy, biologic therapy and/or radiation therapy. In some types of NHL, a stem cell transplant may be part of treatment. Depending on your subtype and overall health, you might receive only one of these treatments or you might receive several in combination.

STAGING OF LYMPHOMA

The stage of your lymphoma helps doctors describe the extent of the disease and optimize your treatment approach.

- **Stage I:** Single lymph node or groups of adjacent nodes are affected.
- **Stage II:** Two or more nodal groups on the same side of the diaphragm (the muscle under the lungs that control your breathing).
- **Stage III:** Lymph nodes above and below the diaphragm are affected or nodes above the diaphragm with spleen involvement.
• **Stage IV:** The cancer has spread outside the lymph nodes to organs such as the liver, bones or lungs. Stage IV can also refer to a tumor in another organ and/or tumors in distant lymph nodes.

Talk to your physician to find out exactly which stage you have. Determining the stage and subtype of lymphoma (by microscopic examination of tissue from a biopsy and imaging) are essential steps toward customizing the best treatment to cure your disease.

**TREATMENT OPTIONS FOR LYMPHOMA**

Treatment options depend on the subtype and stage of your lymphoma as well as your overall health. Treatment may include chemotherapy, radiation therapy or biologic therapy, either alone or in combination. It may help to talk to several specialists before deciding on the best course of treatment for you, your disease and your lifestyle.

A **radiation oncologist** is a doctor who specializes in treating cancer with high-energy X-rays or other types of radiation.

A **medical oncologist** is a doctor who specializes in treating cancer with drugs in the form of **chemotherapy or biologic therapy**. Some medical oncologists are also **hematologists**, meaning they have experience treating blood disorders.

**UNDERSTANDING RADIATION THERAPY**

Radiation therapy, also called radiotherapy, is the careful use of radiation to kill diseased cells safely and effectively while avoiding nearby healthy tissue. Radiation oncologists use radiation therapy to cure disease, to control disease growth or to relieve symptoms. Radiation therapy works within diseased cells by damaging their ability to grow. When these cells are destroyed by the radiation, the body naturally eliminates them. Healthy tissues can also be affected by radiation, but they are able to repair themselves in a way that cancer cells cannot.
EXTERNAL BEAM RADIATION THERAPY

External beam radiation therapy is a treatment approach that encompasses a series of outpatient treatments in which radiation is delivered to areas of disease. Radiation therapy has been proven to be very successful at treating and curing the majority of lymphomas.

- Radiation oncologists deliver external beam radiation therapy from a machine called a **linear accelerator**.
- Each treatment is painless and is similar to getting an X-ray. Treatments are usually short and delivered every day from Monday through Friday for several weeks. Sometimes only a few treatments of radiation therapy are required.
- **Involved site radiation** is when your doctor delivers radiation only to the parts of your body known to have disease. Treatments are often combined with chemotherapy, which often precedes radiation.
- Your radiation oncologist may also deliver radiation to the entire body. This is called **total body irradiation**. It is often done before chemotherapy and a stem cell or bone marrow transplant to eliminate any remaining diseased cells.

Radiation therapy may be used alone or in combination with chemotherapy or biologic therapy. You will work with your radiation oncologist to determine which approach is best for you.

BIOLOGIC THERAPY

Biologic therapy, also called immunotherapy, works with your immune system to fight disease. Biologic therapy is like chemotherapy, but with a different approach. Chemotherapy attacks the diseased cells directly, whereas biologic therapy helps your immune system fight the disease.

- **Monoclonal antibodies** work by targeting certain molecules found on the surface of cells within the body. These medications work by attaching themselves to those molecules, which causes some cells to die and makes others more likely to be destroyed by radiation and chemotherapy.
• **Radiolabeled antibodies** are monoclonal antibodies with radioactive particles attached. These antibodies are designed to attach themselves directly to the diseased cells and damage them with small amounts of radiation without injuring nearby healthy tissue.

**CARING FOR YOURSELF DURING TREATMENT**
Cancer treatment can be difficult. You have many issues to cope with. Ask your oncology team, family and friends, for help.

• Get plenty of rest during treatment, and don’t be afraid to ask for help.
• Follow your doctor’s orders. Ask your doctor, nurse or other member of your treatment team if you are unsure about anything or if you have questions about your treatments and side effects.
• Tell your doctor about any medications, vitamins or supplements you are taking to make sure they are safe to use during radiation therapy.
• Eat a balanced diet. A dietician may be able to help you if you have issues with taste or eating.
• Treat the skin exposed to radiation with special care. Wear a shirt when in the sun and avoid hot or cold packs. Use lotions and ointments only after checking with your doctor or nurse. Clean the area with warm water and mild soap.
Side effects are highly dependent on the site of lymphoma radiation therapy. Please talk to your doctors about your specific diagnosis.

** Very low likelihood

- Nausea
- Skin irritation
- Sore throat/pain with swallowing (if chest/head and neck)
- Dry mouth (if head and neck)
- Fatigue
- Lymphedema (if under arm or groin area)
- Heart disease**
- Second cancer**
- Diarrhea/bloating (if abdomen/pelvic)
- Scarring of esophagus (if chest/head and neck)
- Darkening of skin
- Dry mouth (if head and neck)

*Larger bubbles show higher likelihood of occurrence. This list does not represent all of the possible side effects.*
**Short term**

- Sore throat/pain with swallowing (if chest/head and neck)
- Dry mouth (if head and neck)
- Diarrhea/bloating (if abdomen/pelvic)
- Sore throat/pain with swallowing (if chest/head and neck)
- Nausea
- Skin irritation
- Sore throat/pain with swallowing (if chest/head and neck)
- Fatigue
- Lymphedema (if under arm or groin area)
- Heart disease**
- Second cancer**
- Diarrhea/bloating (if abdomen/pelvic)
- Scarring of esophagus (if chest/head and neck)
- Dry mouth (if head and neck)
- Lymphedema (if under arm or groin area)
- Heart disease**
- Second cancer**

**Long term**

- Darkening of skin
- Dry mouth (if head and neck)

This list does not represent all of the possible side effects. Side effects are highly dependent on the site of lymphoma radiation therapy. Please talk to your doctors about your specific diagnosis. **Very low likelihood**
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.