



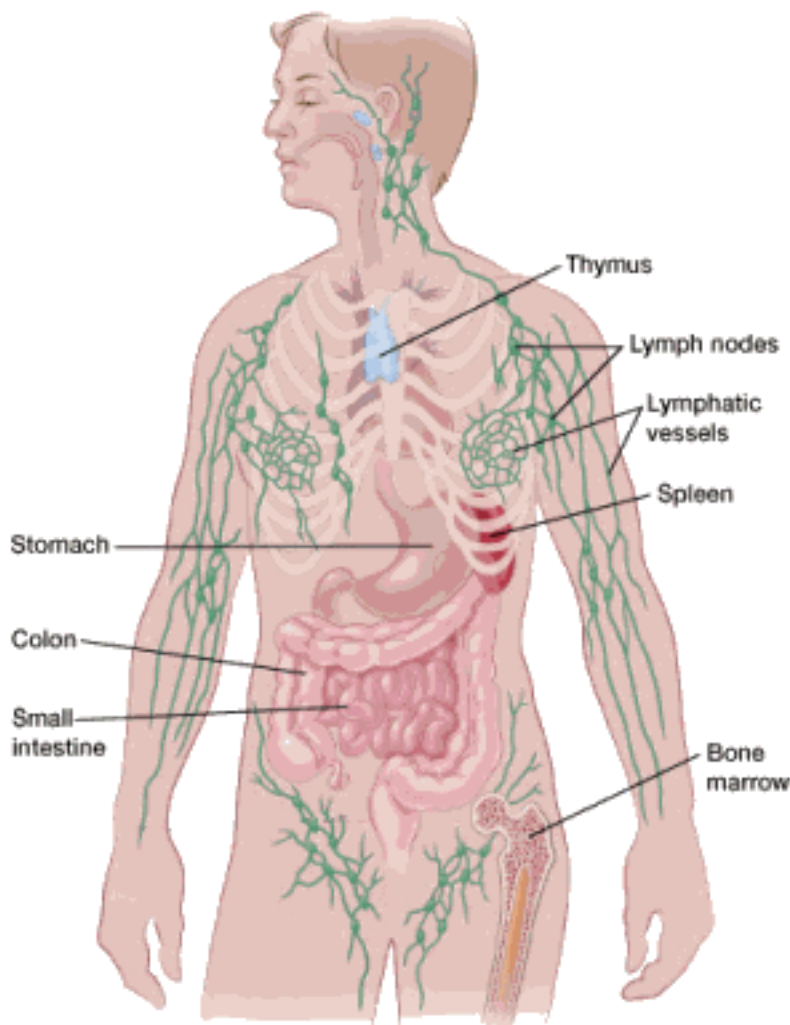
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Lymph Nodes and Cancer

What is the lymph system?

Our bodies have a network of lymph vessels and lymph nodes. (Lymph is pronounced limf.) This network is a part of the body's immune system. It collects fluid, waste material, and other things (like viruses and bacteria) that are in the body tissues, outside the bloodstream.

Lymph vessels are a lot like the veins that collect and carry blood through the body. But instead of carrying blood, these vessels carry the clear watery fluid called lymph.



Lymph fluid flows out from capillary walls to bathe the body's tissue cells. It carries oxygen and other nutrients to the cells, and carries away waste products like carbon dioxide (CO_2) that flow out of the cells. Lymph fluid also contains white blood cells, which help fight infections.

Lymph fluid would build up and cause swelling if it were not drained in some way. That's the role of the lymph vessels. Lymph vessels draw up the lymph fluid from around the cells to send it towards the chest. There, lymph fluid collects into a large vessel that drains into a blood vessel near the heart.

Lymph nodes and what they do

Lymph vessels route lymph fluid through nodes throughout the body. Lymph nodes are

small structures that work as filters for harmful substances. They contain immune cells that can help fight infection by attacking and destroying germs that are carried in through the lymph fluid.

There are hundreds of lymph nodes throughout the body. Each lymph node filters the fluid and substances picked up by the vessels that lead to it. Lymph fluid from the fingers, for instance, works its way toward the chest, joining fluid from the arm. This fluid may filter through lymph nodes at the elbow, or those under the arm. Fluid from the head, scalp, and face flows down through lymph nodes in the neck. Some lymph nodes are deep inside the body, such as between the lungs or around the bowel, to filter fluid in those areas. The lymph fluid slowly flows in from all around the body, making its way back to the chest. At the end of its journey, the filtered fluid, salts, and proteins are dumped back into the bloodstream.

Swollen lymph nodes

When there's a problem, such as infection, injury, or cancer, the node or the group of lymph nodes in that area may swell or enlarge as they work to filter out the "bad" cells. This may be called *lymphadenopathy* (LIMF-ad-uh-**NOP**-uh-thee). Swollen lymph nodes tell you that something is not right, but other symptoms help pinpoint the problem. For instance, ear pain, fever, and enlarged lymph nodes near your ear are clues that you may have an ear infection or cold.

Some areas where lymph nodes commonly swell are in the neck, groin, and underarms. In most cases, only one area of nodes swells at a time. When more than one area of lymph nodes is swollen it's called *generalized lymphadenopathy*. Some infections (such as strep throat and chicken pox), certain medicines, immune system diseases, and cancers like [lymphoma](#)¹ and [leukemia](#)² can cause this kind of swelling. The health care provider will look for more information to figure out the cause of the swelling. Lymph node swelling is often caused by something other than cancer.

Cancer in the lymph nodes

Cancer can appear in the lymph nodes in 2 ways: it can either start there or it can spread there from somewhere else.

Cancer that starts in the lymph nodes is called lymphoma. You can read more about lymphoma in [Hodgkin Disease](#)³ and [Non-Hodgkin Lymphoma](#)⁴.

More often, cancer starts somewhere else and then spreads to lymph nodes. That is the focus of this section.

How does cancer spread to lymph nodes?

Cancer can spread from where it started (the primary site) to other parts of the body.

When cancer cells break away from a tumor, they can travel to other areas of the body through either the bloodstream or the lymph system. Cancer cells can travel through the bloodstream to reach distant organs. If they travel through the lymph system, the cancer cells may end up in lymph nodes. Either way, most of the escaped cancer cells die or are killed before they can start growing somewhere else. But one or two might settle in a new area, begin to grow, and form new tumors. This spread of cancer to a new part of the body is called *metastasis*.

In order for cancer cells to spread to new parts of the body, they have to go through several changes. They first have to become able to break away from the original tumor and then attach to the outside wall of a lymph vessel or blood vessel. Then they must move through the vessel wall to flow with the blood or lymph to a new organ or lymph node.

When cancer grows inside lymph nodes, it usually affects the lymph nodes near the tumor itself. These are the nodes that have been doing most of the work to filter out or kill the cancer cells.

How is cancer in lymph nodes found?

Normal lymph nodes are tiny and can be hard to find, but when there's infection, inflammation, or cancer, the nodes can get larger. Those near the body's surface often get big enough to feel with your fingers, and some can even be seen. But if there are only a few cancer cells in a lymph node, it may look and feel normal. In that case, the doctor must check for cancer by removing all or part of the lymph node.

When a surgeon operates to remove a primary cancer, one or more of the nearby (regional) lymph nodes may be removed as well. Removal of one lymph node is called a *biopsy*. When many lymph nodes are removed, it's called *lymph node sampling* or *lymph node dissection*. When cancer has spread to lymph nodes, there's a higher risk that the cancer might come back after surgery. This information helps the doctor decide whether more treatment, like [chemo](#)⁵ or [radiation](#)⁶, might be needed after [surgery](#)⁷.

Doctors may also take samples of one or more nodes using needles. Usually, this is done on lymph nodes that are enlarged. This is called a *needle biopsy*. The tissue that's removed is looked at under the microscope by a pathologist (a doctor who diagnoses illness using tissue samples) to find out if there are cancer cells in it

Under the microscope, any cancer cells in the nodes look like the cancer cells from the primary tumor. For instance, when breast cancer spreads to the lymph nodes, the cells in the nodes look like breast cancer cells. The pathologist prepares a report, which details what was found. If a node has cancer in it, the report describes what it looks like and how much was seen.

Doctors may also use scans or other imaging tests to look for enlarged nodes that deep in the body. For more on this, see [Imaging \(Radiology\) Tests⁸](#). Often, enlarged lymph nodes near a cancer are assumed to contain cancer.

What does it mean if there's cancer in my lymph node?

It depends. Sometimes there are so few cancer cells in the node that the pathologist must use special tests to find them. In the case of a very few cancer cells in a lymph node, it may not change the treatment plan at all.

If there's a lot of cancer in a node, the large mass can be seen easily. If the cancer is growing out of the lymph node through the layer of connective tissue on the outside (called the *capsule*), it's called *extracapsular extension*.

More cancer in the nodes may mean that the cancer is fast growing and/or more likely to spread to other places in the body. But if nearby lymph nodes are the only other place cancer is found beyond the main (primary) site, surgery to remove the main tumor and the nearby lymph nodes may be able to get rid of it all.

Cancer that has spread to nodes further away from the primary cancer will more likely need extra treatment with chemo or radiation.

Cancer in nodes affects cancer stage

Treatment of cancer is based on the type of cancer a person has, and the stage of the cancer. Doctors use a system to assign a stage to the cancer. The most common staging system is the TNM system. The T in TNM stands for tumor, the M stands for metastasis, and the N stands for lymph nodes. If there's no cancer found in the lymph nodes near the cancer, the N is assigned a value of 0. If nearby or distant nodes show cancer, the N is assigned a number such as 1, 2 or sometimes 3, depending on how many nodes are affected, how much cancer is in them, how large they are, and where they are.

A cancer with lower TNM numbers is usually easier to treat and has a better outlook for survival. For instance, a cancer with T1, N0, M0, would be a cancer that was found very

early, before it spread. The T1 would mean a small tumor, the N0 means that no nodes are involved, and the M0 means that no metastases were found. For more information on staging, see information about [your cancer type](#)⁹, or read [Staging](#)¹⁰.

Effects of removing lymph nodes

Nodes that have been removed during cancer surgery can leave part of the body without a way to drain off the lymph fluid in the affected area. Many of the lymph vessels now run into a dead end where the node used to be, and fluid can back up. This is called [lymphedema](#)¹¹, and it can become a life-long problem. The more lymph nodes that are removed, the more likely it is to occur.

Removing lymph nodes during cancer surgery is highly unlikely to weaken a person's immune system, since the immune system is large and complex and is located throughout the body.

Hyperlinks

1. www.cancer.org/cancer/lymphoma.html
2. www.cancer.org/cancer/leukemia.html
3. www.cancer.org/cancer/hodgkin-lymphoma.html
4. www.cancer.org/cancer/non-hodgkin-lymphoma.html
5. www.cancer.org/treatment/treatments-and-side-effects/treatment-types/chemotherapy.html
6. www.cancer.org/treatment/treatments-and-side-effects/treatment-types/radiation.html
7. www.cancer.org/treatment/treatments-and-side-effects/treatment-types/surgery.html
8. www.cancer.org/treatment/understanding-your-diagnosis/tests/imaging-radiology-tests-for-cancer.html
9. www.cancer.org/cancer/all-cancer-types.html
10. www.cancer.org/treatment/understanding-your-diagnosis/staging.html
11. www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/lymphedema.html

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