

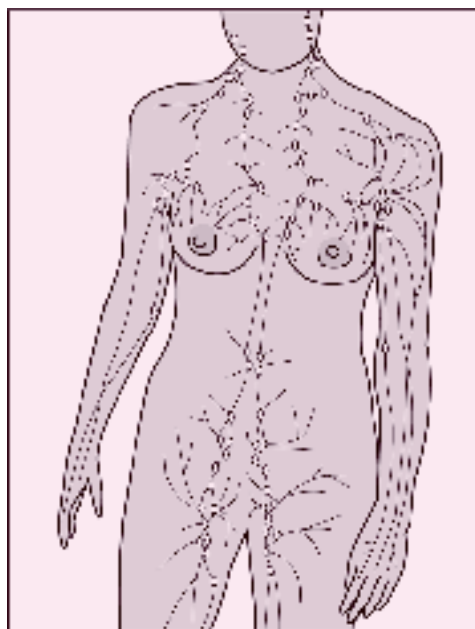
Lymphatic system and axillary nodes

Lymph nodes are part of the lymphatic system, which carries waste products and other materials away from the cells in your body. These materials are carried to the lymph nodes in a colorless fluid called lymph. Lymph nodes filter this fluid before it returns to the blood stream. Lymph nodes also store white blood cells (called *lymphocytes*) that help fight infection. Lymph nodes in the underarm are called the *axillary* [AK-sil-air-e] *nodes*, and are important in determining breast cancer stage and the likelihood that breast cancer has spread to other parts of the body. During surgery, some axillary nodes are removed to see if cancer cells are present.

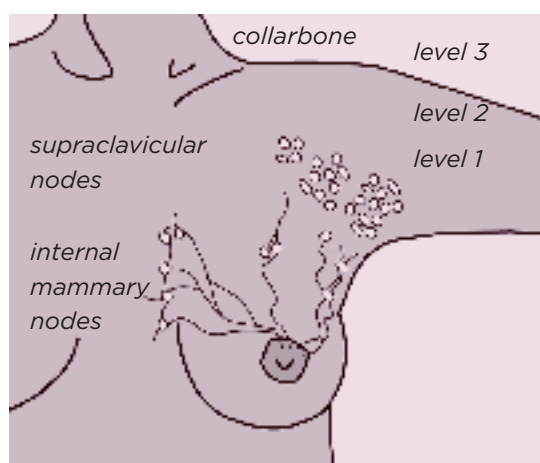
Axillary nodes and breast cancer

The axillary nodes form a chain from the underarm to the collarbone. Level 1 nodes are located in the underarm and receive most of the lymph fluid from the breast. Level 2 nodes are farther up and receive the fluid from Level 1 and some fluid from the breast and chest wall. Level 3 nodes are below the collarbone and receive fluid from Levels 1 and 2 and from the upper part of the breast and chest wall. Supraclavicular lymph nodes are located above the collarbone. When breast cancer develops, Level 1 nodes are usually affected first.

To determine whether or not lymph nodes are involved in the breast cancer, axillary nodes are often removed from Levels 1 and 2 during surgery. These nodes are examined under a microscope to see if cancer cells are present. If cancer cells are present, there is a higher chance the cancer *may* have spread to other parts of the body. Finding out whether or not the cancer has spread to the axillary nodes helps determine the stage of the breast cancer and the type of treatment needed.



The lymphatic system runs throughout the body.



Lymph node levels and the internal mammary nodes

Sentinel node biopsy

Sentinel [SEN-tih-nel] *node biopsy* is a procedure used to determine if axillary lymph nodes contain cancer. During surgery, a radioactive substance and/or a blue dye is injected into the cancer site to locate the first axillary node (sentinel node) that receives drainage from the breast. These injected substances are not harmful. An instrument called a Geiger counter is used to measure the activity of the radioactive substance in the first draining lymph node. If the dye is used, the sentinel node will look blue. After locating the first few axillary nodes, using the dye or Geiger counter, they are removed and examined to see if cancer cells are present. If cancer is present, then more lymph nodes are removed. If cancer is not present, no more lymph nodes are taken. This procedure can reduce the number of lymph nodes that are removed, thus reducing the risk of infection and lymphedema (swelling of the arm).

Lymphedema

Lymphedema [lim-fa-DEE-ma] is a build-up of lymphatic fluid, which causes swelling in the arm and hand, and sometimes in the chest/breast/back on the side of surgery. When the lymphatic system is damaged, fluid collects in the tissue of the affected area causing swelling. The surgical removal of the lymph nodes in the underarm area and/or radiation therapy to the affected area can interfere with normal lymph drainage. Lymphedema can develop weeks, months or years after treatment and can vary in its severity. For more information about how you can prevent lymphedema and treatment options, please read the *lymphedema* fact sheet.

Axillary lymph node status

Whether the axillary lymph nodes are found to contain cancer is one of three factors used to determine breast cancer stage. Tumor size and spread of cancer to other areas of the body are the other two factors. There are five possibilities regarding lymph node involvement:

NX: nodes cannot be evaluated

N0: axillary nodes do not have cancer

N1: axillary nodes have cancer but are not attached to one another or the chest wall

N2: axillary nodes have cancer and have attached to one another or the chest wall, or nodes within the breast have cancer

N3: internal mammary or supraclavicular or infraclavicular (above or below the collarbone) nodes have cancer (see picture on the front side)

Resources

American Cancer Society
1-800-ACS-2345
www.cancer.org

National Cancer Institute
1-800-4 CANCER
www.cancer.gov

National Lymphedema Network
1-800-541-3259
www.lymphnet.org

Related fact sheets in this series:

- Lymphedema
- Prognostic Factors
- Breast Surgery