

## Lymphoma - Non-Hodgkin - Childhood - Diagnosis [1]

This section has been reviewed and approved by the [Cancer.Net Editorial Board](#) [2], 06/2014

**ON THIS PAGE:** You will find a list of the common tests, procedures, and scans that doctors can use to find out what's wrong and identify the cause of the problem. To see other pages, use the menu on the side of your screen.

Doctors use many tests to diagnose cancer and find out if it has spread to another part of the body, called metastasis. Some tests may also determine which treatments may be the most effective. A biopsy is the only way to make a definitive diagnosis of lymphoma. Imaging tests may be used to find out whether the cancer has spread. This list describes options for diagnosing this type of cancer, and not all tests listed will be used for every person. Your child's doctor may consider these factors when choosing a diagnostic test:

- Age and medical condition
- Type of cancer suspected
- Signs and symptoms
- Previous test results

The doctor will first perform a physical examination and take a complete medical history to help determine if a child has non-Hodgkin lymphoma. In addition, the following tests may be used to diagnose non-Hodgkin lymphoma:

**Biopsy** [3]. A biopsy is the removal of a small amount of tissue for examination under a microscope. Other tests can suggest that cancer is present, but only a biopsy can make a definite diagnosis. The sample removed during the biopsy is studied by a pathologist. A pathologist is a doctor who specializes in interpreting laboratory tests and evaluating cells, tissues, and organs to diagnose disease. If the tumor is near the surface, a local anesthetic is usually given to numb the biopsy area before the procedure. If it is deeper inside the body, a general anesthetic is usually given to block the awareness of pain.

**Bone marrow aspiration and biopsy** [4]. These two procedures are similar and often done at the same time to examine the bone marrow. Bone marrow has both a solid and a liquid part. A bone marrow aspiration removes a sample of the fluid with a needle. A bone marrow biopsy is the removal of a small amount of solid tissue using a needle. The sample(s) are then studied by a pathologist. A common site for a bone marrow aspiration and biopsy is the pelvic bone, which

is located in the lower back by the hip. The skin in that area is usually numbed with medication beforehand, and other types of anesthesia (medication to block the awareness of pain) may be used.

**Lumbar puncture (spinal tap).** A lumbar puncture is a procedure in which a doctor uses a needle to take a sample of cerebral spinal fluid (CSF) to look for cancer cells, blood, or tumor markers. Tumor markers are substances found in higher than normal amounts in the blood, urine, or body tissues of people with certain types of cancer. CSF is the fluid that flows around the brain and the spinal cord. Doctors generally give an anesthetic to numb the lower back before the procedure.

**Cytogenetic analysis.** A pathologist may examine the pairs of chromosomes (strings of DNA that contain genes) from the biopsy under the microscope to check for chromosomal abnormalities. This helps the doctor identify the subtype of lymphoma and plan treatment.

**Flow cytometry and immunocytochemistry.** These tests help the doctor determine the subtype of non-Hodgkin lymphoma. In a flow cytometry test, cells from the lymph nodes, bone marrow, or blood are removed and treated with a fluorescent, dye-equipped antibody that attaches to DNA. The cells are then passed in front of a laser beam, which allows a special computer to measure their DNA level. Higher amounts of DNA than normal may indicate cancer. During an immunocytochemistry test, fluorescent antibodies or immunoperoxidase staining may be used to determine the subtype of non-Hodgkin lymphoma.

## **Imaging tests**

To determine where the cancer is and whether it has spread, the doctor may use the following imaging tests:

**X-ray.** An x-ray is a way to create a picture of the tissues and organs inside of the body using a small amount of radiation. A chest x-ray is the most common type of x-ray taken for diagnosing NHL.

**Computed tomography (CT or CAT) scan** [5]. A CT scan creates a three-dimensional picture of the inside of the body with an x-ray machine. A computer then combines these images into a detailed, cross-sectional view that shows any abnormalities or tumors. A CT scan can also be used to measure the tumor's size. Sometimes, a special dye called a contrast medium is given before the scan to provide better detail on the image. This dye can be injected into a patient's vein or given as a pill to swallow.

**Magnetic resonance imaging (MRI)** [6]. An MRI uses magnetic fields, not x-rays, to produce detailed images of the body. MRI can also be used to measure the tumor's size. A special dye called a contrast medium is given before the scan to create a clearer picture. This dye can be injected into a patient's vein or given as a pill to swallow.

**Bone scan** [7]. A bone scan uses a radioactive tracer to look at the inside of the bones. The tracer is injected into a patient's vein. It collects in areas of the bone and is detected by a special camera. Healthy bone appears gray to the camera, and areas of injury, such as those caused by cancer, appear dark.

**Positron emission tomography (PET) scan** [8]. A PET scan is a way to create pictures of organs and tissues inside the body. A small amount of a radioactive sugar substance is injected into the patient's body. This sugar substance is taken up by cells that use the most energy. Because cancer tends to use energy actively, it absorbs more of the radioactive substance. A scanner then detects this substance to produce images of the inside of the body.

The information from PET scans is often used with the information from a CT scan, MRI, and physical examination to decide if cancer is present in tissues. It can help show the difference between benign (noncancerous) findings from a CT scan or MRI and malignant (cancerous) tumors that may not be clear on a CT scan or MRI. The exact accuracy and role of PET scanning in NHL is not yet clear, although tumors that contain lymphoma cells often show up on a PET scan. In the future, a PET scan may help monitor aggressive types of lymphoma and the disease's response to treatment.

After diagnostic tests are done, your child's doctor will review all of the results with you. If the diagnosis is cancer, these results also help the doctor describe the cancer; this is called staging.

*The next section helps explain the different stages for this type of cancer. Use the menu on the side of your screen to select Stages, or you can select another section, to continue reading this guide.*

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**Links:**

[1] <http://www.cancer.net/cancer-types/lymphoma-non-hodgkin-childhood/diagnosis>

[2] <http://www.cancer.net/about-us>

[3] <http://www.cancer.net/node/24406>

[4] <http://www.cancer.net/node/24409>

[5] <http://www.cancer.net/node/24486>

[6] <http://www.cancer.net/node/24578>

[7] <http://www.cancer.net/node/24410>

[8] <http://www.cancer.net/node/24648>