

Texas Children's Cancer Center and Hematology Service

Neuroblastoma

What is neuroblastoma?

Neuroblastoma is a type of cancer that arises from the autonomic nervous system in the body. The autonomic nervous system controls things like blood pressure in the arteries, movement within the intestines, sweating, and many other activities. Parts of the autonomic nervous system lie along the spine and in the adrenal glands above the kidneys. Neuroblastoma may start in any of these areas. Most often, it starts in the abdomen—either in the adrenal glands or around the spinal cord. Neuroblastoma can also start around the spinal cord in the chest, neck, or pelvis. It can spread to lymph nodes, liver, skin, bone marrow, bone, lungs and brain.

Neuroblastoma is one of the most common kinds of cancer in children. It occurs most often in babies and very young children. It does not occur very often in children older than 10. Neuroblastoma can have many different symptoms. The most common ones are fever, pain, or a mass. Rarely a syndrome called “opsoclonus-myoclonus” is the first sign of neuroblastoma. This syndrome causes fast, jerky movements of the eyes, arms, and legs.

Like most cancers, neuroblastoma is most easily treated when it is present in limited areas of the body.

Treatment option overview

There are treatments for all patients with neuroblastoma. Your child's chance of recovery (prognosis) and choice of treatment depend on his or her age, the stage of the neuroblastoma, and the characteristics of the tumor caused by the neuroblastoma.

- **Surgery** can be used to remove the cancer.
- **Radiation therapy** uses high-dose x-rays or other high energy rays to kill cancer cells and shrink tumors.
- **Chemotherapy** uses drugs to kill cancer cells and shrink tumors.

Stages and treatment

Once neuroblastoma has been found, more tests will be done to find out how much of the cancer there is and if it has spread from the place where it started to other parts of the body. This is called staging. Neuroblastoma may occur in stages 1, 2A, 2B, 3, 4, and 4S. Your child's doctor needs to know the stage of the disease to plan treatment.

Stage I: Localized Resectable

The cancer is found only in the place where it started and can be removed by surgery. It has not spread to other tissues or lymph nodes.

Treatment

Your child will be treated with surgery to remove the tumor.

Stage 2A: Localized Unresectable

The cancer is found only in the place where it started and is only on one side of the spine but cannot be totally removed by surgery.

Treatment

Your child's treatment may be surgery to remove as much of the cancer as can be removed safely. Chemotherapy may or may not follow. Surgery may be done again to remove cancer that remains after treatment with chemotherapy. This second surgery may be followed by radiation therapy.

Stages 2B and 3: Regional

The cancer has spread from the place where it started to the tissues or lymph nodes around this place. It may or may not be completely removable by surgery.

Treatment

Treatment depends on your child's age.

If your child is less than one year old, treatment may be one of the following:

1. surgery to remove the cancer
2. chemotherapy with or without another operation to remove any remaining cancer

If your child is more than one year old, treatment may be one of the following:

1. surgery to remove the cancer
2. chemotherapy with or without another operation to remove any remaining cancer
3. chemotherapy with or without radiation therapy followed by surgery
4. a clinical trial of high doses of chemotherapy and radiation therapy followed by bone marrow transplantation
5. a clinical trial of chemotherapy and radiation therapy given at the same time

Stage 4: Disseminated

The cancer has spread to lymph nodes far from the place where it started or to the bone, liver, skin, bone marrow, or other organs.

Treatment

Treatment will be one of the following:

1. chemotherapy
2. chemotherapy followed by surgery and radiation therapy
3. a clinical trial of high doses of chemotherapy with or without radiation therapy, possibly followed by bone marrow or stem cell transplant
4. a clinical trial of new methods of treatment

Stage 4S

Stage 4S neuroblastoma is also called "special" neuroblastoma because it behaves differently from neuroblastoma in other stages. The main tumor is usually smaller in size but has spread to the liver, skin, and/or bone marrow. It has not spread to the bones. Stage 4S neuroblastoma is also treated differently than neuroblastoma in other stages.

Treatment

Your child will probably undergo surgery to diagnose the tumor and determine its characteristics. Depending on what the doctors find, your child may not need additional therapy. However, chemotherapy may be needed.

Recurrent

Recurrent neuroblastoma means that the cancer has come back after it has been treated. The cancer may come back in the same place it started or in another part of the body.

Treatment

Your child's treatment depends on where the cancer came back, how far it has spread, and the treatment given before. You may wish to have your child take part in a clinical trial of new methods of treatment.

