

Ready to start planning your care? Call us at [800-525-2225](tel:800-525-2225) to make an appointment.

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Cancer Center

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Once we know the stage of your child's neuroblastoma, we'll speak with you about the best treatments. At MSK Kids, your child has access to every type of neuroblastoma treatment, including surgery, chemotherapy, radiation therapy, immunotherapies with antibodies, cancer vaccines, T-cells and NK-cells, and genetically-guided therapy. Several investigational therapies are only available through clinical trials at MSK. We have a longstanding commitment to using the most-effective therapies with the fewest side effects. Thanks to our expert doctors and forward-thinking investigators, we have successfully spared many young children with neuroblastoma from unnecessary toxic treatments and enabled many of them to beat their disease.

Personalizing Your Child's Care

In addition to the information we learned during staging, we use a tool developed at MSK called MSK-IMPACT™. This test allows us to analyze every neuroblastoma for genetic mutations so we can target the cancer using novel anticancer drugs. We do this at both the time of diagnosis as well as later,

if the cancer comes back. With MSK-IMPACT, we always know what molecular factors are driving neuroblastoma's growth. This is a precision medicine approach to cancer care. At MSK Kids, we take this approach for every child with cancer, including yours.

## Will my child need surgery for neuroblastoma?

If your child must have surgery, MSK's neuroblastoma surgeons have excellent success in safely removing even the most challenging tumors. Learn more about [neuroblastoma surgery at MSK Kids](#).

## Chemotherapy for Neuroblastoma

Many children with intermediate- to high-risk neuroblastoma receive a combination of [chemotherapy](#) drugs before or after surgery to shrink the tumor and destroy any cancer cells in the body. We identify the combination of drugs that is most-effective with the fewest side effects. Our doctors pioneered the use of high-dose chemotherapy that forms the backbone of many neuroblastoma clinical trials across the United States. We have exceptional experience selecting the treatment that is most appropriate for your child.

## Antibody Therapy for Neuroblastoma

Perhaps the greatest mark MSK Kids has made on neuroblastoma care is the invention of antibodies that target and kill the cancer cells. This form of immunotherapy is typically used in people with neuroblastoma that persists despite surgery, chemotherapy, or radiation therapy. Thanks to these antibody therapies, many children with neuroblastoma who once would have been told they were out of treatment options are now long-term survivors of the disease. Your doctor will let you know if your child is a candidate for antibody therapy. It is given by IV on an outpatient basis so your child doesn't have to spend extra time in the hospital. These antibodies are available through clinical trials at MSK Kids as well as other hospitals across the country and around the world. We have been able to bring the fruits of our research to children everywhere. We have the largest and longest experience in the world creating and evaluating antibody therapies for neuroblastoma.

## Naxitamab (Hu3F8)

Since the 1980s, MSK Kids doctors have treated children with neuroblastoma with an antibody called 3F8. It attaches to neuroblastoma cells and helps focus a patient's own immune system — especially white blood cells — on attacking neuroblastoma cells. Conventional 3F8 is made from mouse cells. Humanized 3F8 (Hu3F8 or naxitamab) was introduced in 2011. It is made to be more like the human immune system, so it may be associated with fewer side effects than standard mouse-derived 3F8. Naxitamab is used in children with neuroblastoma that has persisted after chemotherapy or radiation therapy. The US Food and Drug Administration granted a [Breakthrough Therapy Designation to naxitamab in 2018](#). This indicates it is significantly better than standard therapies and expedites the evaluation and approval process. We are continuing to assess naxitamab with new drug combinations through clinical trials.

## Omburtamab

Omburtamab is an antibody that carries liquid radioactive iodine directly to neuroblastoma cells in the brain while sparing nearby brain and spinal cord tissue. MSK Kids has been evaluating its use since 2004. Omburtamab received the FDA's [Breakthrough Therapy Designation in 2017](#). MSK Kids is the only hospital to earn this designation for neuroblastoma treatments and the only one to receive two of these designations two years in a row. Through a seamless collaboration with experts in nuclear medicine and radiation safety, omburtamab is actually made at MSK and shipped to any hospital evaluating it in clinical trials.

## Bispecific Antibody Treatment

MSK Kids scientists have combined naxitamab with a second antibody, HuOKT3, to create what is known as a bispecific antibody. It is capable of attaching to two sites on neuroblastoma cells. HuOKT3 activates a type of immune cell called a T cell. A clinical trial at MSK is assessing the use of this bispecific antibody in people with recurrent or persistent neuroblastoma, osteosarcoma, and other solid tumors with a protein called GD2 on the surface.

## Vaccines for Neuroblastoma

Cancer vaccines are another form of immunotherapy. They train the immune system to identify and destroy neuroblastoma cells lurking in the body after chemotherapy. We have the most experience in the world with cancer vaccines for children with neuroblastoma. More than 250 children have received a

novel neuroblastoma vaccine invented at MSK Kids. This vaccine is currently being evaluated in clinical trials here and around the world. It is called a bivalent vaccine because it targets two proteins found on neuroblastoma cells: GD2L and GD3L. It is the only pediatric tumor vaccine in existence. It helps train the body to do the work of naxitamab. This treatment is designed to help people who have no evidence of disease remain clear of neuroblastoma without needing ongoing naxitamab therapy.

## Harnessing Natural Kill Cells

Previous studies at MSK Kids have shown that natural killer (NK) cells (white blood cells that recognize and kill abnormal cells) work well along with naxitamab to target neuroblastoma. Other work has shown that introducing NK cells obtained from a donor can boost the activity of NK cells against neuroblastoma. At MSK Kids, we are conducting a clinical trial evaluating a treatment for neuroblastoma that has come back or continues to grow that combines naxitamab, the anticancer drug cyclophosphamide, and NK cells from a donor. Patients also receive a treatment called interleukin-2 (IL-2) to stimulate NK cells and help them grow and survive.

## Pinpoint Radiation Therapy

While effective in killing cancer cells, radiation therapy also harms healthy nearby organs and tissue. At MSK, we are reluctant to use it in children unless absolutely necessary. We offer proton therapy for neuroblastoma instead. This advanced form of radiation therapy involves the use of charged particles called protons rather than the X-rays that are used in conventional radiation therapy. The protons penetrate tissue just to a certain depth and do not affect nearby healthy tissues.

## Liquid Radiation Therapy

Although we can use radiation to treat specific parts of the body affected by neuroblastoma, we use a form of liquid radiation treatment called metaiodobenzylguanidine (MIBG) therapy in people with widespread disease. MIBG targets large sites of neuroblastoma while sparing normal tissue. [Lutetium Lu 177 dotatate](#) (Lutathera®) is another type of liquid radiation we sometimes use for neuroblastoma. It also consists of a radioactive part and a tumor-targeting part. Liquid radiation treatment is given by IV. Your child's doctor will let you know if this is an option for your child.

### New Patient Appointments

Call [833-MSK-KIDS](tel:833-MSK-KIDS) Available Monday through Friday, 9 a.m. to 5:30 p.m. (Eastern time)

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