

# A Guide to Proton Therapy for Patients with Childhood Cancers



Proton therapy is a particularly important treatment option for children. Children’s bodies are more vulnerable to the effects of excess radiation, making them more prone to secondary tumors than adults, and to more serious short- and long-term side effects. These include developmental delays and growth problems. The risk of side effects is related to the amount of tissue irradiated. Proton therapy may reduce this risk.

Proton therapy is generally preferred for treating solid tumors in children because it delivers less radiation to healthy tissue. The following diagram compares the radiation dose from protons to the most sophisticated form of X-ray radiation. In this case, the treatments targeted medulloblastoma, a common childhood cancer. Proton therapy delivers less radiation to the heart, lungs, abdomen and esophagus. Protecting these critical

organs lowers the chances of adverse effects years after treatment. It also lessens the chance that cancers will occur at other sites in the body.

## Partnership with Seattle Children’s

At Fred Hutch Cancer Center, we work closely with experts at nearby Seattle Children’s, which has been consistently ranked one of the best children’s hospitals in the United States by U.S. News & World Report. Specialists such as medical oncologists, surgeons and anesthesiologists work closely with our proton radiotherapy experts.

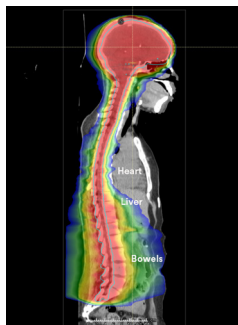
Together, they create the best treatment plan for each child. The collaboration extends to every aspect of your child’s care. They will also work closely with your referring doctor through all phases of care.

## Access to a Child Life Specialist

Your child’s cancer diagnosis can be very challenging for your entire family to deal with, but you’re not alone. Child life specialists are pediatric health care professionals. They work with children and families in hospitals and other settings. Their skill and caring expertise can help you and your child understand what is happening. We have a child life specialist on staff, and Seattle Children’s also offers counseling.

## Proton Therapy vs. Standard Therapy with X-rays

Standard radiation



Proton therapy



Radiation levels



The illustration shows the difference between proton therapy on the right, where less healthy tissue is subjected to radiation, and standard X-ray radiation on the left, where more radiation affects surrounding, healthy tissue.

## A child life specialist can:

- Explain a diagnosis or treatment in words your child or teen can understand
- Create a coping plan your child can use during the treatments
- Offer support during and after treatments
- Use play to help your child understand medical procedures and express feelings
- Work with medical staff to assess your child's unique needs
- Give you information about child development and the effects of health care
- Teach techniques to help your child cope and relax
- Offer support to help families cope with death or loss in partnership with the Journey Program

## Anesthesia

Depending on your child's age, he or she may have to undergo anesthesia to receive treatments. This is advised for anyone who would not be able to hold still during treatments. Anesthesiologists from Seattle Children's have special training in giving anesthesia to children. Treatments with proton therapy are extremely precise. For this reason, the patient must be positioned in exactly the same place each time. Immobilization devices like bean bags and masks help with this. Young children have a hard time lying still even with the devices. Anesthesia helps children remain still during treatment.

### Find out more.

To learn more about proton therapy for childhood cancers or to schedule a consultation, please call us at **(888) 645-6934** or visit **[FredHutch.org/protontherapy](https://FredHutch.org/protontherapy)**

## About Proton Therapy

### The Bragg Peak

During proton therapy, a beam of subatomic particles called protons is sped up in an accelerator and then aimed at the tumor. The nature of protons is such that the radiation dose increases suddenly, in what is called a Bragg Peak. Then the radiation falls effectively to zero. This allows radiation oncologists to precisely target tumors, minimize radiation to healthy tissue in front of the tumor, and avoid healthy tissue behind the tumor. Radiation oncologists can spread the Bragg Peak to cover the entire tumor.

### The Advantages of Pencil Beam Scanning (PBS)

PBS is the latest proton technology that allows for even greater accuracy when treating cancer with proton radiation. PBS uses a narrow proton beam to paint the tumor with radiation. Because the pencil beam can be targeted even more precisely, higher, more effective doses can be used. The pencil beam deposits radiation starting at the deepest layer, and works slice by slice through the tumor.

## About our Specialists

All our radiation oncologists are faculty at the University of Washington School of Medicine and all are board certified. All our physicians are experts in proton therapy and other forms of radiation. They will provide you with an expert recommendation for you to consider.

### Fred Hutch Cancer Center - Proton Therapy

Located on UW Medicine's Northwest Campus  
1570 N. 115th Street