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Proton Beam Therapy

Proton Beam Therapy is a relatively new radiation treatment used for treating cancers, especially those that are soft tissue cancers such as cancer of the eye, lungs, breasts, prostate, and spinal cord. However, as for all things, there are both good and bad aspects to it. First, it is important to understand what cancer is as well as the current treatments so that it is easy to see why Proton Beam therapy is so revolutionary.

Cancer is defined as a disease where damaged cells experience uncontrolled, growth, invasion of surrounding cells, and metastasis (spreading through the blood stream or lymph system). Cancer accounts for about 13% of all deaths in the world per year, with about 7.6 million people dying of cancer in 2007. This fact makes cancer a top priority among researchers because cancer is a disease that, given good treatment, is beatable and new and better treatments will save many lives.

One of the most common cancer treatments in the medical world today is known as chemotherapy. Chemotherapy is defined as any treatment involving the use of chemical agents to stop cancer cells from growing. These drugs can be administered directly into the blood stream, orally in the form of a pill, or through an injection right into the tumor. However, chemotherapy works by destroying cancer cells but it cannot tell the difference between cancer cells and other healthy cells which grow rapidly such as hair (this is why many chemo patients lose their hair). This also causes some unpleasant side effects such as a decrease in red and white blood cells as well as platelets.

Radiation is also a very common treatment for cancer patients. The technician sends concentrated doses of x-ray radiation at the cancer cells and the radiation is enough to kill the cancer. However, this also has some unpleasant side effects mostly due to the accuracy of radiation. The radiation also hits the neighboring healthy cells and either kills them too or in rare cases can cause cancer by destroying the DNA of the neighboring cells.

Proton Beam Therapy is a relatively new advancement in radiation treatment and uses concentrated doses of protons instead of x-ray radiation to kill the cancer cells. This machinery consists of a particle accelerator (to shoot the protons at the tumor at 2/3 the speed of light) and large, powerful magnets to direct the protons. This revolutionary treatment, however, does have its pros and cons. This treatment is very effective at killing soft tissue cancers such as prostate, lung, breast, skin, and eye cancers which also happen to be the most common types of cancers and therefore the most deadly. It is also extremely accurate (half a millimeter) and in turn decreases surrounding tissue damage. It also takes fewer treatments, is painless, and has almost no side effects. However, it costs about twice the amount of traditional treatments and there are only 5 facilities worldwide which offer it raising ethical issues about who deserves to be treated the most.

The fact of the matter is that Proton Beam Therapy proved to be extremely effective in testing and worked 97% of the time in treating prostate cancer over a 5 year period (raised survival rate from 90% to 97%). The effectiveness of it is undeniable but the cost may be too great.

Sources

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