

Can Stem Cells Restore Fertility in Men Who Had Childhood Cancer?

Hoping to restore his fertility after childhood cancer treatment, a man received the first known transplant of sperm-producing stem cells.

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As part of a cutting-edge study aimed at [restoring fertility](#) in young male cancer survivors, a 26-year-old man who had [childhood cancer](#) has received the first known [transplant](#) of sperm-producing [stem cells](#), according to [The Associated Press](#) (AP).

Cancer and its treatments, such as [chemotherapy](#) and [radiation](#), can have detrimental effects on the reproductive system and impair [patients' fertility](#). For example, some types of chemotherapy can decrease [sperm](#) production.

At age 11, Jaiwen Hsu was diagnosed with [bone cancer](#) and underwent chemotherapy. Hoping to improve Hsu's chances of one day becoming a father, his parents connected with University of Pittsburgh Medical Center (UP) researchers who were freezing testicular cells of young boys with cancer as part of a [clinical trial](#).

Led by reproductive scientist Kyle Orwig, PhD, a professor at UP's Department of Obstetrics, Gynecology and Reproductive Sciences, the clinical trial involves cryo-preserving the immature testicular tissues of young boys with the goal of restoring their fertility in young adulthood.

Since 2011, [Orwig's team has frozen samples](#) from about 1,000 prepubertal boys, according to the AP. Although the testicular tissues do not yet produce sperm due to their immaturity, they produce stem cells with the potential to produce sperm, Orwig said in a [video segment for](#) the AP.

Now 26 years old and 10 years into remission, Hsu is the first childhood cancer survivor in the clinical trial to return as an adult to test whether reimplanting those testicular cells might restore his fertility.

“We’re not expecting a miracle result,” Orwig warned. “What we expect is that the transplant of stem cells will produce a small amount of sperm and that in order to achieve a pregnancy with his partner that he would need a follow-up assisted reproductive technology, like IVF [in vitro fertilization].”

Orwig said the injection was safe and easy to perform, according to a [paper published this week](#) that has not yet been peer-reviewed.

While it is too soon to know whether the experiment will work in humans, Orwig successfully preserved and reintroduced testicular tissue from a young male monkey in 2019 that, in an animal version of IVF, resulted in the birth of a healthy baby monkey.

“The science behind it is so incredibly new that right now it’s kind of a waiting game,” Hsu said in the video. “It’s kind of eagerly crossing our fingers and hoping for the best.”

While only time will tell whether the procedure is effective, researchers hope that their ongoing investigation will encourage more families to consider fertility preservation for young people with cancer.

Hsu said that even if the experimental transplant does not work, he is grateful his parents “made a call that gave me the option to make the choice for myself today.”

To learn more, click [#Fertility](#) or read Cancer Health’s Basics on [Fertility Issues When You Have Cancer](#). It reads in part:

Men and Fertility

Cancer and its treatment can have a variety of effects on a man’s fertility. Depending on the type of treatment and individual factors, these changes may be temporary or permanent.

Cancers that affect the reproductive organs, including the penis, testicles and prostate gland, increase the chances of long-term or permanent fertility problems. Removal of one testicle usually does not result in infertility if the other remains healthy. After removal of the prostate gland, a man will no longer be able to produce semen, the fluid that contains sperm. Some surgeries for other types of cancer in the same area (such as bladder or colon cancer) can also affect the reproductive organs. Surgery can sometimes cause nerve damage that leads to

problems getting an erection or releasing semen.

Radiation therapy involving the abdomen, pelvis or spine can harm the reproductive organs. Often, external organs, including the testicles, can be protected from radiation with shielding. Radiation therapy to the brain can damage the pituitary gland, which can lead to altered production of testosterone and other hormones.

Some types of chemotherapy can decrease sperm production. Radiation and chemotherapy can damage the genetic material in sperm, but new replacement sperm cells are continuously being produced. Some chemotherapy drugs can get into the semen, so use condoms during treatment to protect your partner from exposure.

Many men will have options for fathering children after cancer treatment. These may include banking sperm and freezing testicular tissue prior to treatment. Saving testicular tissue can potentially preserve the future fertility of young boys who do not yet produce semen.