

For young boys with cancer, testicular tissue banking may be option to preserve fertility

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For parents of children with cancer, the hopeful news is that pediatric survival rates have steadily improved for decades. Among the bad news—treatments that enable survival often cause infertility.

Boys diagnosed with cancer who have reached puberty currently have an opportunity to preserve their fertility: before undergoing cancer treatment, they may have their semen frozen and preserved in sperm banks. Younger boys, however, do not produce sperm, although their testicular tissue contains young cells that will eventually become sperm.

Now The Children's Hospital of Philadelphia is offering a unique option to those boys: from infants up to younger adolescents, at-risk boys can have a tiny portion of their testis removed and frozen for their potential future use. Researchers are also using part of the tissue to investigate ways to help the [immature cells](#) in the testes to develop into useable sperm.

The procedure is experimental. No one knows if it will be effective in humans, but scientists are hopeful that successes seen in animal models will also occur with human tissue. Despite the experimental nature of this work, it offers an option that does not otherwise exist for these patients. Early observations from a new study at Children's Hospital indicate that parents of prepubertal boys are willing to agree to the procedure, and are grateful for the opportunity, even though there is no certainty that the preserved tissue will be useful to their sons in the future.

"Even though there are currently no guarantees of clinical success, families are highly receptive to this option," said pediatric oncologist Jill P. Ginsberg, M.D., of The Children's Hospital of Philadelphia, who led a research study published online Oct. 27 in the journal [Human Reproduction](#). One of Ginsberg's collaborators is Ralph L. Brinster, V.M.D., Ph.D., Richard King Mellon professor of Reproductive Physiology at the University of Pennsylvania School of Veterinary Medicine, an internationally renowned expert in genetics and reproduction.

Starting in January 2008, a multidisciplinary team at Children's Hospital approached the families of 21 boys, ranging from three months old to age 14, who had been just diagnosed with various solid tumors. All faced the imminent prospect of treatments with chemotherapy or radiation that carried a significant risk of male infertility.

Of the 21 families approached, 16 consented to the biopsy as part of the research study, an acceptance rate of 76 percent. Fourteen of the 16 underwent the procedure.

In the procedure, performed at the same time the child was already under general anesthesia for standard clinical care, Thomas Kolon, M.D., a urologist at Children's Hospital, removes a small piece, about half the size of the tip of a pencil eraser, from one of the testes. Half of each specimen is frozen for potential future use. The remaining half is saved for research and analysis in Dr. Brinster's lab. In all cases, the biopsy was done safely, without any negative side effects such as excessive bleeding, pain or infection.

All of the families in the study completed a questionnaire regarding their beliefs about fertility and the factors involved in their decision whether to freeze testicular tissue. Five of the 21 families refused the biopsy, with a key factor being that they were too overwhelmed by their child's

cancer diagnosis to make the decision about the testicular biopsy. In addition, a majority of the families presented with the option said having a limited time to decide about the biopsy was stressful, as they often had to decide quickly, before therapy started. Other factors, such as religion, ethics, financial considerations, and the fact that cryopreservation is currently experimental did not appear to play a major role in the parents' decision-making.

"As stressful as a child's cancer diagnosis is, many parents said they wanted to be presented with options that might lead to future success in saving their sons' fertility," said Ginsberg, the director of the [Cancer Survivorship Program](#) at Children's Hospital.

Much work remains, including advancing the laboratory science, until it will be possible to use the frozen tissue to restore fertility for these boys. The ultimate hope is that, in the future, once the patient is ready to begin a family, health care providers would thaw the preserved tissue, then reimplant it in the patient's testes or use it for other assisted reproduction technologies. Ginsberg and her co-authors are cautiously optimistic that the fruits of this current research will make using this tissue to restore fertility a reality for her patients. In the meantime, she says, the positive response to the fertility preservation program encourages Children's Hospital staff to continue their efforts within the context of this research.

Source: Children's Hospital of Philadelphia ([news](#) : [web](#))

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