



THE HORMONE
FOUNDATION®



SaveMyFertility.org



CHILDREN AND CANCER Protecting Your Child's Fertility and Healthy Puberty

Why is it important to think about your child's future fertility now?

When your child has cancer, life-saving treatment is, of course, your first priority. Today most children survive childhood cancer. But future fertility—the ability to conceive a child or maintain a pregnancy—can become impaired from some cancers or cancer treatments. Many parents want to improve their children's chances of having children of their own one day. Often the best time to do so is before cancer treatment begins. Ask your child's doctor about **fertility-saving options** as soon as possible after your child's cancer diagnosis.

How does cancer treatment affect future fertility?

Chemotherapy can damage eggs and sperm, as well as cells in the ovaries and testicles that produce sex hormones.

Radiation can harm fertility when treatment is directed at the ovaries or testicles, the nearby pelvis or belly, or the whole body. Future infertility also can result from radiation to the brain and pituitary gland (a hormone-producing gland at the base of the brain). The brain works with the pituitary gland to start the process of puberty.

In girls, high-dose radiation treatment to the pelvis may harm the uterus, making it harder to get pregnant and to carry a baby.

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What is the chance of infertility?

Not all children become infertile after cancer treatment. The impact that cancer treatment may have on **fertility depends on many factors**. These include:

- Type and dose (amount) of chemotherapy
- Dose and location of radiation therapy
- Site of surgery
- In girls, puberty status (infertility may be less likely when treatment is before puberty)

Some cancer drugs are more likely to cause infertility than others. So are multi-drug treatments, which are common in treating childhood cancers. Having radiation treatment plus chemotherapy also raises the risk. Because the chance of infertility varies so much, **talk to your child's doctors** about his or her risks.

What are the options for fertility preservation?

Your child's doctor may refer you to a fertility specialist to discuss fertility-saving treatments. Treatment options depend on whether your child has gone through puberty. Children who have reached puberty have more **options to save their fertility**. Most girls start puberty between ages 8 and 13 years. Most boys start producing sperm by age 13.

Options for boys after puberty include:

- **Sperm banking.** Freezing (cryopreservation) of sperm is the most successful way to preserve fertility before cancer treatment. The most common way to collect the semen (the fluid carrying sperm) is through masturbation. Boys who cannot ejaculate (eject semen from the penis) may have vibrational or electrical stimulation to help them do so. The sperm stay frozen, or "banked," until needed. Freezing—even for many years—does not damage sperm.
- **Testicular sperm extraction.** Even if a boy's semen has no sperm, he may still have sperm in the testicles. In testicular sperm extraction, a surgeon removes small pieces of testicular tissue while the boy is sedated or under local or general anesthesia. If the tissue contains sperm, the sperm are removed and frozen. This technique may be an option before or after cancer treatment.
- **Shielding of testicles during radiation therapy.** It is sometimes possible to shield the testicles to protect them from radiation during treatment.
- **Testicular tissue freezing.** Some clinics are testing this experimental method. It involves removing and freezing small pieces of testicular tissue before cancer treatment. This tissue may be re-implanted in the future, but so far, no children have been born using this method.

Your child's doctor may refer you to a fertility specialist.

Options for girls after puberty include:

- **Pelvic shielding during radiation therapy.** It may be possible to shield one or both ovaries to protect them from radiation during treatment.
- **Ovarian transposition.** Before radiation treatment to the pelvic or spinal region, a surgeon moves one healthy ovary, or both, to another spot in the girl's body outside the treatment field.
- **Egg banking.** This experimental method involves freezing and storing unfertilized eggs. It usually requires fertility drugs and monitoring with ultrasounds and blood work for about 2 weeks. This could delay the start of cancer treatment and may not be an option for some girls. Banking embryos (fertilized eggs) is an option if a girl is willing to use sperm from a partner or a sperm donor to fertilize the eggs. However, this is not a common treatment for adolescent girls. It also requires about 2 weeks of fertility drugs.
- **Ovarian tissue banking.** This experimental method involves removing small pieces of an ovary and storing the tissue frozen. A surgeon may be able to re-implant the tissue after cancer treatment. This may not be a safe option for girls with leukemia because there could be cancer cells in the tissue. The tissue might also be used to mature the follicles and enclosed eggs and fertilize the eggs outside of the body, but no children have been born using this technique yet.

Before puberty, children have fewer options because they do not yet make sperm or mature eggs. Their only options to preserve fertility are shielding during radiation therapy, freezing tissue from the reproductive organs (ovaries or testicles), or ovarian transposition for girls.



How does cancer treatment in young children affect puberty?

Because of cancer treatment, children may be at risk for early or delayed puberty.

Early, or “precocious,” puberty is any physical sign of **sexual maturity** before the age of 9 in boys and age 8 in girls. This may occur after radiation to the brain. Radiation can cause early release of hormones from the brain that signal the body to start puberty.

Puberty is delayed when it has not started by age 14 in boys or 13 in girls. This may also occur from radiation to the brain, or if treatment harms the testicles or ovaries so they cannot produce sex hormones.

Being ahead of or behind their peers in sexual maturity may cause some children to have emotional or social adjustment problems.

What are the treatments for early or late puberty?

To treat early puberty, medicines can stop the release of sex hormones. Treatment most often is stopped when the child reaches the normal age of puberty.

Children with delayed puberty may receive treatment with estrogen (girls) or testosterone (boys) to help bring about normal signs of puberty.

What should you do with this information?

Your child’s doctors may not raise the topic of fertility preservation or how cancer treatment can affect puberty. You should raise the issue if you have concerns. Here are some questions to ask the doctor:

- How quickly does my child need to start cancer treatment?
- Will cancer or its treatment affect my child’s future fertility?
- What are my child’s options to preserve fertility?
- What are the success rates for each option?
- Will my medical insurance cover the cost of these procedures?
- Is my child at risk for early or delayed puberty?

Resources

Save My Fertility
SaveMyFertility.org

Fertile Hope
www.fertilehope.org

Find-an-Endocrinologist
www.hormone.org/FindAnEndo/index.cfm

American Society for Reproductive Medicine
www.asrm.org/patient_resources

The Hormone Foundation
www.hormone.org

KidsHealth
kidshealth.org

Oncofertility Consortium
myoncofertility.org
oncofertility.northwestern.edu or call
1-866-708-FERT (1-866-3378)

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