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Fertility Concerns and Preservation for Women [1]

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Many cancer treatments affect fertility. This effect can be temporary or permanent. Fertility is your ability to become pregnant. Infertility is when you are not able to get pregnant or maintain a pregnancy.

Before treatment begins, talk with your health care team about how treatment could affect your fertility. Also, ask about your options for preserving fertility.

How cancer treatments affect fertility

Fertility problems from cancer or cancer treatment occur in 2 main ways:

- Damage to organs involved in reproduction, such as the ovaries, fallopian tubes, uterus, and cervix
- Damage to organs involved in hormone production, such as the ovaries

The ovaries are very important. These are the organs that store a woman's eggs. Damage to the ovaries can cause a decrease in ovarian reserve. Ovarian reserve is the total number of immature eggs in both ovaries. The loss of healthy eggs causes infertility and early [menopause](#) [3]. Because these eggs cannot be regrown, this damage will not go away.

Cancer treatments that affect fertility

The following cancer treatments have known or possible fertility-related side effects. How other cancer medications affect a woman's fertility is not yet known.

- Chemotherapy, especially drugs called alkylating agents. Drugs that can affect fertility include:
 - Busulfan (Busulfex, Myleran)
 - Carmustine (BiCNU)
 - Chlorambucil (Leukeran)
 - Cyclophosphamide (Neosar)
 - Doxorubicin, (Adriamycin)
 - Lomustine (CeeNU)
 - Mechlorethamine (Mustargen)
 - Melphalan (Alkeran)
 - Procarbazine (Matulane)
- Radiation therapy to the entire body for stem cell/bone marrow transplants
- Radiation therapy to the abdomen, pelvis, lower spine, ovaries and near the ovaries, uterus, and pituitary gland in the brain
- Surgical removal of any of the reproductive organs:
 - The uterus, in a procedure called a hysterectomy

- Cervix, through a trachelectomy or a hysterectomy
- One or both ovaries, called an oophorectomy
- Surgery to remove pelvic lymph nodes

If you have concerns about your fertility, meet with a reproductive endocrinologist. A reproductive endocrinologist is a doctor who specializes in conditions affecting fertility. One who is familiar with the effects of cancer and cancer treatment will be most helpful to you.

Assessing fertility after cancer treatment

If you have menstrual periods after cancer treatment, you may still be able to get pregnant. However, continuing to menstruate is not proof that you are fertile. In some women, cancer treatments cause a stop in menstrual periods, called early menopause, and permanent infertility. In others, menstrual periods stop during treatment but return over time. Many cancer drugs reduce ovarian reserve, and women who have periods after chemotherapy may still have lowered fertility.

It generally takes longer for older women and those who had higher doses of radiation therapy or chemotherapy to restart menstruation. Also, these women are less likely to have menstruation restart after treatment.

Even a woman who menstruates during treatment and remains fertile afterward might still have lowered fertility or experience early menopause. Talk with your doctor if you received chemotherapy or radiation therapy in the past and are concerned about fertility. Your doctor can refer you for ovarian reserve testing with sensitive hormonal tests, such as the anti-Müllerian hormone (AMH).

Children and younger women have a larger ovarian reserve compared with older women. So, they are less likely to experience immediate menopause and infertility after chemotherapy. However, this does not mean that younger women will not lose their fertility after treatment. With radiation to the pelvic and lower abdomen and very strong chemotherapy, even children can experience immediate menopause.

Becoming pregnant

For a woman to become pregnant without [reproductive assistance](#) [4] after finishing cancer treatment, she must have the following:

- At least one healthy ovary with enough remaining eggs

- One healthy fallopian tube, which is the structure that the egg travels through
- A healthy uterus where the baby can grow
- An ideal level of specific hormones.

After treatment, your doctors may recommend that you wait a number of years before trying to become pregnant. The amount of time depends on the type and stage of cancer, the type of treatment, and your age. For example, women taking hormonal treatments, such as tamoxifen for 5 to 10 years may need to delay pregnancy.

A delay can further reduce fertility because cancer treatment may have lowered ovarian reserve and women lose eggs as they age. Ask about fertility preservation options, if you would like to become pregnant and are facing a long delay. Read more about [having a baby after cancer](#) [5].

Fertility-preserving options for women

Ideally, most fertility-preserving procedures need to be done before cancer treatment begins. The options available depend on several factors:

- Age
- Relationship status, such as whether a woman has a partner who could provide sperm
- How physically and sexually mature a woman is
- A woman's feelings about specific procedures

Your doctor and/or a doctor who specializes in fertility issues can help you explore those options, which may include:

- **Embryo freezing.** Embryo freezing is the most successful method of fertility preservation for women. For this option, a woman needs to take fertility drugs for about two weeks. Then, her eggs are collected and fertilized by sperm in a laboratory. This is called in vitro fertilization. The resulting embryos are frozen until the woman is ready to become pregnant. Although fertility drugs increase estrogen, drugs called aromatase inhibitors can keep the levels low for women with estrogen-sensitive cancers.

- **Oocyte (unfertilized egg) freezing.** This procedure is similar to embryo freezing, except that the eggs are frozen without being fertilized by sperm. This procedure may pose fewer practical issues than freezing embryos because a male partner is not needed. However, it is slightly less successful. Some women may want to use [this calculator](#) [6] to estimate the success rate of freezing eggs.
- **Fertility-preserving surgery.** Some types of surgery for cervical or ovarian cancer can treat the cancer and help keep a woman's fertility.
 - Women who have surgery to remove the cervix while keeping the uterus may become pregnant. Then, they can deliver the baby by cesarean section (C-section). This may be an option for some women with early-stage cervical cancer.
 - Some women with early-stage ovarian cancer in only one ovary can have surgery to remove that ovary. A woman who can have this surgery will still have her healthy ovary and uterus.
- **Protecting the ovaries from radiation therapy.** As described above, radiation treatment to both ovaries causes infertility. Some women may be able to get radiation to only one ovary to preserve fertility. Another option is a procedure called oophoropexy. In this procedure, one or both ovaries are moved where radiation treatment won't reach them. Then, they are returned after treatment. This method isn't always successful. Radiation isn't precise and may reach the ovaries or the ovarian blood supply, even if they are moved.
- **Ovarian suppression.** This investigational procedure involves taking hormones that suppress ovarian function to protect eggs from treatment. The procedure's effectiveness has not yet been shown and is generally not recommended as a reliable method of fertility preservation.
- **Ovarian tissue preservation.** This investigational procedure requires the surgical removal and freezing of ovarian tissue. Then, this tissue is transplanted back into the woman after cancer treatment. This may be the only option for young girls who cannot undergo oocyte or embryo freezing because of lack of time or sexual immaturity. Even though many pregnancies have occurred with this technique, it is too early to evaluate its success rates.

Not all of these options are appropriate for everyone. Fertility-preserving procedures are often costly and their effectiveness varies. Additionally, they are an added stress in an already

stressful time. You may consider speaking with a [counselor](#) [7] for guidance about these decisions, in addition to your doctor.

Learn more about [ASCO's recommendations for preserving fertility](#) [8].

Questions to ask the doctor

Consider asking your doctor or another member of your health care team the following questions before treatment begins:

- What is the risk of temporary or permanent infertility from the recommended treatments for my type, stage, and grade of cancer? Are there other treatments that do not pose as high a risk but that are equally effective?
- What options do I have to preserve my fertility?
- Will any of these options postpone the start of my treatment? If so, what effect could this delay have on my chance of recovery (prognosis)?
- Will any of these fertility preservation options increase the risk that the cancer may come back?
- Should I talk with a fertility specialist or a reproductive endocrinologist before starting treatment?
- What clinical trials are available to me?
- Where can I find support for coping with fertility issues?
- Whom can I contact if I need help talking with my spouse or partner about fertility issues?
- How will I know if I am fertile after cancer treatment?

More Information

[Moving Forward Video: Fertility for Young Adults with Cancer](#) [9]

[Preserving Fertility in Children With Cancer](#) [10]

[Survivorship](#) [11]

Additional Resources

Livestrong: [Fertility Services](#) [12]

Several books are also available on this topic; check your library or bookseller.

Links

- [1] <http://www.cancer.net/es/navigating-cancer-care/dating-sex-and-reproduction/fertility-concerns-and-preservation-women>
- [2] <http://www.cancer.net/es/node/51>
- [3] <http://www.cancer.net/node/25069>
- [4] <http://www.cancer.net/node/29111>
- [5] <http://www.cancer.net/node/29106>
- [6] <http://fertilitypreservation.org/index.php/probability-calc>
- [7] <http://www.cancer.net/node/24699>
- [8] <http://www.cancer.net/node/29921>
- [9] <http://www.cancer.net/node/28071>
- [10] <http://www.cancer.net/node/29101>
- [11] <http://www.cancer.net/node/22>
- [12] <http://www.livestrong.org/we-can-help/fertility-services/>