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Fertility Concerns and Preservation for Women [1]

This section has been reviewed and approved by the Cancer.Net Editorial Board [2], 03/2014

Key Messages:

- Many types of cancer treatment can reduce a woman?s fertility, which is the ability to have children.
- Temporary or permanent infertility occurs when treatment affects the function of the reproductive endocrine system, which includes the glands and other organs that make hormones and produce eggs.
- Before treatment begins, talk with your doctor about the possible fertility-related side effects and options you may have for preserving your fertility.

The inability to have children (infertility), permanent or temporary, is a common side effect of many cancer treatments. Before your recommended treatment plan begins, it is important to talk with your doctor or another member of your health care team about how your fertility (ability to have children) may be affected and your options for preserving it.

How cancer treatments affect fertility

Fertility problems occur when cancer or cancer treatments damage glands or organs involved in reproduction (such as the ovaries, fallopian tubes, uterus, and cervix) or hormone production (such as the ovaries, thyroid, and adrenal glands).

The ovaries are especially important, as these organs store a woman?s eggs. Any damage to the ovaries can cause a decrease in ovarian reserve, which is the total number of immature eggs in both ovaries. The loss of healthy eggs results in infertility and early menopause [3]. Because these eggs cannot be regenerated, this damage is permanent.

The following cancer treatments have known or potential fertility-related side effects:

- Chemotherapy, especially drugs called alkylating agents. These include cyclophosphamide (Neosar), chlorambucil (Leukeran), busulfan (Busulfex, Myleran), procarbazine (Matulane), carmustine (BiCNU), lomustine (CeeNU), mechlorethamine (Mustargen), and melphalan (Alkeran). In addition, drugs such as doxorubicin, (Adriamycin) may also have damaging effects. However, the effects of other cancer medications on a woman?s fertility are not yet

known.
- Radiation therapy to the entire body; this approach is used for bone marrow/stem cell 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, including the uterus (hysterectomy), cervix (trachelectomy, although a hysterectomy might include removal of the cervix), and one or both ovaries (oophorectomy)
- Surgery to remove pelvic lymph nodes

Women with concerns should be evaluated by a fertility preservation expert (reproductive endocrinologist) who is familiar with the effects of cancer and cancer treatment on fertility.

Assessing fertility after cancer treatment

A woman?s ability to have menstrual periods after cancer treatment often relates to her ability to become pregnant, but continuing to menstruate is not proof that a woman is fertile. In some women, cancer treatments cause a stop in menstrual periods (early menopause) and permanent infertility. In others, menstrual periods stop during treatment but return over time. Because many cancer drugs reduce ovarian reserve, even women who continue to have periods after chemotherapy may have significantly diminished fertility.

In general, the higher the dose of radiation therapy or chemotherapy, and the older the woman is when she starts treatment, the longer the amount of time needed for her menstrual periods to return and the greater the chance that they will not. Even if a woman continues to menstruate during treatment and remains fertile afterward, she might still experience decreased fertility or menopause earlier than expected. Continued menstruation should not be an assurance of fertility. Women who have received chemotherapy or radiation therapy in the past and are concerned about their future fertility should have their ovarian reserve evaluated by more sensitive hormonal tests (such as the anti-Müllerian hormone, AMH) as soon as possible.

Children and younger women are less likely to experience immediate menopause and infertility after chemotherapy because they have larger ovarian reserve compared with older women. However this does not mean that younger women will not lose their fertility after cancer treatment. With radiation to the pelvic and lower abdominal area 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 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, and an ideal level of specific hormones.

It is important to note that women may be advised to wait a number of years after cancer treatment before trying to become pregnant. The amount of time depends on the type and stage of cancer, the type of treatment, and age. Because cancer treatment may have already reduced the ovarian reserve and because women lose eggs as they get older, this delay may result in

further reduction in fertility. Women who wish to become pregnant and may be facing a significant delay in pregnancy due to cancer type or hormonal cancer treatments (such as women who are prescribed tamoxifen for five to 10 years) should have a fertility preservation evaluation.

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. Your age, relationship status (whether you have a partner who could provide sperm), physical and sexual maturation, and feelings about specific procedures all affect the available fertility preservation options. 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. It requires that a woman take fertility drugs for about two weeks. Then, her eggs are collected and fertilized by sperm in a laboratory (in vitro fertilization). The resulting embryos are then frozen until the woman is ready to become pregnant. Although fertility drug treatment increases estrogen levels, 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, but 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. Women with early-stage cervical cancer who have surgery to remove the cervix while keeping the uterus intact may become pregnant and can deliver by cesarean section. Some women with early-stage ovarian cancer in only one ovary can have surgery to remove that ovary, leaving the healthy ovary and uterus in place.

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, which involves surgically moving one or both ovaries out of the reach of the radiation treatment and returning them after treatment. However, this method isn?t always successful because the radiation isn?t precise and may reach the ovaries or the ovarian blood supply, even if the ovaries are moved.

Ovarian suppression. This experimental procedure involves taking hormones that suppress ovarian function to protect eggs from treatment. The procedure?s effectiveness has not yet been demonstrated 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 before it is transplanted back into the woman after cancer treatment. This procedure 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 stressful in an already stressful time, and their effectiveness varies. 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 associated with the treatments recommended for my type, stage, and grade of cancer? Are there any 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

Fertile Hope [12]

Fertile Hope: Risk Calculator [13]

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

Links:
[1] http://www.cancer.net/coping-and-emotions/sexual-and-reproductive-health/fertility-concerns-and-preservation-women
[2] http://www.cancer.net/about-us
[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://fertilehope.org/
[13] http://www.fertilehope.org/tool-bar/risk-calculator.cfm