introduction

If you want to become a parent after cancer, we would like to give you the information you need to make those dreams come true.

In this booklet you will find an overview of information about the risks of infertility from cancer treatments and your family-building options. We encourage you to use this booklet:

• To understand how your fertility can be affected by cancer and cancer treatments
• To make it easier for you to talk about cancer and fertility with your medical team
• To help you think about planning your family before, during and after cancer
• To educate your friends, family and caregivers about why planning your family is important to you

Please remember, this booklet provides only an overview. For more detailed information about your risks, options, clinics in your area, and other tools designed to help you customize what you find here, please visit our website at www.LIVESTRONG.org/fertilehope or call 866-965-7205.
men

Infertility means that you cannot get a woman pregnant. For men, infertility happens when your body does not make enough healthy sperm to achieve pregnancy or when sperm is blocked from getting out of the body.

Fertility Risks

The risk of infertility from cancer treatments depends on many things, including:

**Chemotherapy**
- Type
- Duration
- Dose

**Surgery**
- Location
- Scope of surgery

**Radiation**
- Location
- Dose

**Other**
- Age
- Pre-treatment fertility status
- Cancer type

Fertility Preservation Options

There are many ways to preserve fertility before cancer treatments. The following are available options listed by the types of cancer treatments you may be having:

**Chemotherapy**
- Sperm banking
- Testicular tissue freezing* (before puberty)
- Testicular sperm extraction (after puberty)

**Surgery**
- Sperm banking
- Testicular tissue freezing* (before puberty)
- Testicular sperm extraction (after puberty)

**Radiation**
- Sperm banking
- Testicular tissue freezing* (before puberty)
- Testicular sperm extraction (after puberty)
- Radiation shielding

*experimental
Possible Fertility Outcomes

Cancer treatments can affect the reproductive system in many ways. After treatment, your fertility may fall into one of these categories:

<table>
<thead>
<tr>
<th>Normal Fertility</th>
<th>Temporarily Infertility</th>
<th>Compromised Fertility</th>
<th>Permanent Sterility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal sperm function and count. Many men undergo cancer treatment and are able to father children naturally with no change in their fertility.</td>
<td>No sperm in the ejaculate. Sperm production may stop for a temporary amount of time. It may return immediately or many years after cancer treatments end.</td>
<td>Compromised sperm function and/or count. This can occur due to impaired sperm production, interference with hormone production, or damage to the nerves and ducts that carry sperm out of the body. This can make natural conception hard, and may require the assistance of fertility doctors.</td>
<td>No ejaculated sperm. Some men will no longer produce sperm after treatment. There may be low levels of sperm in the testicles that may be used to try to have children with help from a doctor.</td>
</tr>
</tbody>
</table>

I was...devastated when the oncologist told me that I might become sterile as a result of my cancer treatment.

Brian, 19 years old, Hodgkin lymphoma

Parenthood After Cancer Options

There are many ways to become a father after cancer. After your cancer treatments end, a test called a semen analysis can measure your fertility. Based on the results of the test, the following may be options for you:

<table>
<thead>
<tr>
<th>Normal Fertility</th>
<th>Temporarily Infertility</th>
<th>Compromised Fertility</th>
<th>Permanent Sterility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural conception</td>
<td>Natural conception</td>
<td>Conception with the help of a doctor using fresh or banked sperm</td>
<td>Using banked sperm</td>
</tr>
<tr>
<td>Other family-building options are also available.</td>
<td></td>
<td>Testicular sperm extraction</td>
<td>Testicular sperm extraction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Donor sperm</td>
<td>Donor sperm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Adoption</td>
<td>Adoption</td>
</tr>
</tbody>
</table>

...
Important Tips for Men

- Not all cancers and cancer treatments will affect your ability to have a baby. Ask your oncology team about your risks.
- Sperm banking is the most successful, least expensive way to preserve your fertility. It should be done before cancer treatments start.
- Even if you have a very low sperm count, sperm banking is generally recommended.
- Sperm can be frozen for many years and still used to try to have a baby.
- Due to possible genetic damage to sperm from cancer treatments, doctors usually recommend waiting 6 to 12 months after the end of chemotherapy or radiation before trying to conceive naturally.
- Sperm production may return immediately or many years after cancer treatments. If you do not want to become a parent, you should use contraception, even if you think that you are infertile.
- Children born to cancer survivors are not at higher risk for birth defects or cancer than the general population, unless the cancer involved is caused by a known genetic mutation. If this is the case, it may be possible to use certain genetic screening methods to help prevent passing the gene mutation on to your children.

women

Infertility is when you cannot start or maintain a pregnancy. For women, infertility can happen when:

- the ovaries no longer contain a supply of healthy eggs
- damage to the reproductive system prevents a fertilized egg from successfully implanting and growing in the uterus
- damage to the reproductive system prevents you from being able to hold or maintain a pregnancy

Fertility Risks

The risk of infertility from cancer treatments depends on many things including:

**Chemotherapy**
- Type
- Duration
- Dose

**Radiation**
- Location
- Dose

**Surgery**
- Location
- Scope of surgery

**Other**
- Age
- Pre-treatment fertility status
- Cancer type
### Fertility Preservation Options

There are many ways to preserve fertility before cancer treatments. The following are available options listed by the types of cancer treatments you may be having:

#### Chemotherapy
- Embryo freezing
- Egg (oocyte) freezing*
- Ovarian tissue freezing*
- Ovarian suppression

#### Surgery
- Embryo freezing
- Egg (oocyte) freezing*
- Ovarian tissue freezing*
- Fertility sparing surgeries

#### Radiation
- Embryo freezing
- Egg (oocyte) freezing*
- Ovarian tissue freezing*
- Ovarian transposition
- Radiation shielding

*experimental

### Possible Fertility Outcomes

Cancer treatments can affect the reproductive system in many ways. After treatment, your fertility may fall into one of these categories:

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Normal Fertility</strong></td>
<td>Normal reproductive function. Many women who undergo cancer treatment have no change in their fertility and are able to have a baby naturally.</td>
</tr>
<tr>
<td><strong>Fertility Followed by Early Menopause</strong></td>
<td>Temporary fertility. Many cancer treatments damage some, but not all, of the eggs in your ovaries. This means that you may have a period of time when you are fertile after cancer treatments and then go into early menopause.</td>
</tr>
<tr>
<td><strong>Compromised Fertility</strong></td>
<td>Decreased fertility. This can happen from damage to the ovaries, hormone production or reproductive system. This damage can make natural conception hard, but pregnancy may be possible with help from a fertility doctor.</td>
</tr>
<tr>
<td><strong>Immediate Menopause</strong></td>
<td>No ovarian function. This can happen if all of your eggs are damaged by your cancer treatments and/or your reproductive system is removed.</td>
</tr>
</tbody>
</table>

If anything, cancer made my desire to become a parent stronger. Cancer made me stop and think about what was really important in life.

Lindsay, 30, Tongue Cancer
Parenthood after Cancer Options

There are many ways to become a mother after cancer. After your cancer treatments end, a doctor can measure your fertility with hormone tests and ovarian ultrasounds. Based on the results of these tests, and your ability to carry a pregnancy, the following may be options for you:

**Normal Fertility**
- Natural conception
- Other family-building options are also available

**Fertility Followed by Early Menopause**
- Natural conception
- Fertility preservation options in case you enter menopause before you complete building your family
- Conception with the help of a doctor
- Using frozen embryos, eggs or ovarian tissue
- Donor eggs or embryos
- Gestational surrogacy
- Adoption

**Compromised Fertility**
- Natural conception
- Conception with the help of a doctor
- Using frozen embryos, eggs or ovarian tissue
- Donor eggs or embryos
- Gestational surrogacy
- Adoption

**Immediate Menopause**
- Using frozen embryos, eggs or ovarian tissue
- Donor eggs or embryos
- Gestational surrogacy
- Adoption

Important Tips for Women

- Not all cancers and cancer treatments will affect your ability to have a baby. Ask your oncology team about your risks.
- Even if your period returns, damage to your ovaries from your cancer treatments may put you into menopause 5, 10 or even 20 years earlier than is common.
- Eggs, embryos and ovarian tissue can be frozen for many years and still be used to try to have a baby.
- Your medical team may recommend that you wait anywhere from 6 months to 5 years after cancer treatments to try to get pregnant.
- The return of your period does not always mean that you are fertile – and not having a period does not always mean that you are infertile. If you are not ready to become a parent, you should use contraception, even if you think that you are infertile.
- Current research shows that pregnancy after cancer does not cause recurrence, even after breast cancer.
- Some cancer treatments can cause long-term damage your heart and lungs. This damage can sometimes complicate pregnancy. Ask your doctor if pregnancy is safe for you.
- Children born to cancer survivors are not at higher risk for birth defects or cancer than the general population—unless the cancer involved is caused by a known genetic mutation. If this is the case, it may be possible to use certain genetic screening methods to help prevent passing the gene mutation on to your children.
### Breast Cancer

<table>
<thead>
<tr>
<th>Special Consideration</th>
<th>Available Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Some breast cancers are hormonally sensitive. This means that standard fertility treatments and medications may be unsafe.</td>
<td>There are new fertility options and medication choices that may be safer for breast cancer patients.</td>
</tr>
<tr>
<td>Some breast cancer patients carry the BRCA gene and do not want to pass it on to their children.</td>
<td>It may be possible to use certain genetic screening methods to help prevent passing the gene mutation on to your children.</td>
</tr>
<tr>
<td>Some breast cancer patients carry the BRCA gene and are at higher risk of ovarian cancer and may want their ovaries removed.</td>
<td>It may be possible to build your family or preserve your fertility before having your ovaries removed.</td>
</tr>
<tr>
<td>It is not safe to get pregnant while taking Tamoxifen and some other hormone treatments.</td>
<td>Gestational surrogacy may be an option.</td>
</tr>
</tbody>
</table>

### Gynecological Cancers

<table>
<thead>
<tr>
<th>Special Consideration</th>
<th>Available Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Some gynecological cancers are hormonally sensitive. This means that standard fertility treatments and medications may be unsafe.</td>
<td>There are new fertility options and medication choices that may be safer for gynecological cancer patients.</td>
</tr>
<tr>
<td>Gynecological cancer surgeries can affect future fertility or the ability to carry a pregnancy.</td>
<td>For patients with early stage cancers, fertility sparing surgery may provide successful preservation of your fertility/ability to carry a pregnancy.</td>
</tr>
<tr>
<td>Radiation to the pelvic area can cause changes to the uterus that may make it more difficult to get pregnant or to carry a pregnancy to term.</td>
<td>Gestational surrogacy may be an option for patients who cannot carry a pregnancy in their womb.</td>
</tr>
</tbody>
</table>

### Pediatrics

<table>
<thead>
<tr>
<th>Special Consideration</th>
<th>Available Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-pubescent boys and girls cannot bank sperm or freeze their eggs or embryos.</td>
<td>Experimental options like testicular tissue and ovarian tissue freezing may be available.</td>
</tr>
<tr>
<td>Children may be at risk for early or delayed puberty from their cancer treatments.</td>
<td>Both early and delayed puberty can be treated with medications.</td>
</tr>
<tr>
<td>Girls may go into premature ovarian failure (early menopause) from their cancer treatments.</td>
<td>Hormone replacement therapy or the birth control pill is often used to treat early menopause in young girls.</td>
</tr>
</tbody>
</table>

### Tyrosine Kinase Inhibitors (Gleevec)

<table>
<thead>
<tr>
<th>Special Consideration</th>
<th>Available Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>For women, it is not safe to get pregnant while taking Tyrosine Kinase Inhibitors (Gleevec).</td>
<td>Gestational surrogacy may be an option.</td>
</tr>
</tbody>
</table>
Fertility Resources

More comprehensive information about all of the options included in this booklet is available online at www.LIVESTRONG.org/fertilehope or call 866-965-7205.

Online Tools

Risk Calculator
This online tool allows you to search by cancer or treatment type to see if your risk of infertility is high, medium or low.

Options Calculator
The options calculator allows you to enter basic information about your individual medical situation and receive customized information about family-building options.

Referral Guide
This Guide is a searchable database of doctors and services, including reproductive endocrinologists, sperm banks, financial assistance, adoption agencies and legal resources.

Financial Assistance

The first of its kind, Fertile Hope’s Sharing Hope program offers donated medications as well as discounted sperm, embryo and egg freezing services through a national network of reproductive clinics and sperm banking partners— including the Live:On sperm banking by mail kit.

One-on-One Support

Receive information and support through LIVESTRONG SurvivorCare, which provides free, confidential, one-on-one support to anyone affected by cancer and to the healthcare professionals who treat them.

The LIVESTRONG SurvivorCare team is specifically trained in the subject of cancer and fertility. In addition to fertility information, you can receive assistance with additional concerns, such as:

- Addressing your financial, insurance and employment concerns
- Providing financial assistance for fertility preservation
- Finding ways to deal with physical, emotional and day-to-day concerns
- Educating and matching you to clinical trials and new treatments in development
- Locating and accessing local resources

Please call LIVESTRONG SurvivorCare toll-free Monday through Friday from 9:00 a.m. to 5:00 p.m. CST at (866) 965-7205 or reach us online at www.LIVESTRONG.org/survivorcare.

One of the greatest challenges of being an oncologist is balancing information about treatment and side effects with hope about life after cancer. We have to remember that we are not just trying to cure cancer, we are trying to help our patients live their dreams.

Jennifer Levine, MD, MSW, MA
Columbia University Medical Center, Herbert Irving Cancer Center
Sample Questions to Ask Your Doctor

We encourage you to detach this list of questions and bring them to your doctor if you are interested in learning more about your fertility and post-cancer parenthood choices.

• Will any of my cancer treatments affect my fertility?

• Are there effective cancer treatment options for me that are less likely to cause infertility?

• What are my fertility preservation options?

• How will I know if I am fertile after treatment?

• What is the difference between premature ovarian failure (early menopause) and infertility?

• If I don’t preserve my fertility before treatments, what are my parenthood options after treatment?

• Do I have a type of cancer that can be inherited by my children?

• How long do I need to wait after cancer treatments end to start a family?

• Can you refer me to local or national resources, such as experts, clinics, and nonprofit organizations, for more information?
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