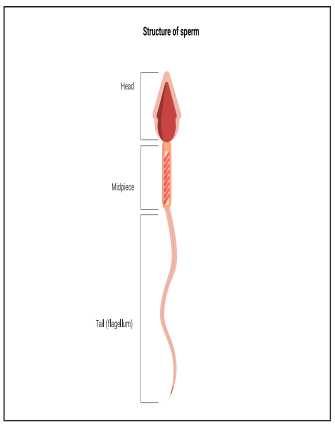
Reproductive Facts

Patient fact sheet developed by the American Society for Reproductive Medicine

Cancer and its impact on sperm, cryopreservation, and fertility

What is the difference between semen and sperm?

This can be confusing since the terms are often used interchangeably in the media and casual conversation. However, they are very different.



Sperm are the male reproductive cells that contain genetic material. A sperm is made up of three main parts: the head, the midpiece, and the tail.

Semen is the liquid that is ejaculated and may or may not contain sperm. This liquid is produced by glands in the reproductive system and also contains enzymes and fructose in addition to sperm.

How can cancer treatment affect my ability to have a child?

Chemotherapy, radiation, surgery and some hormone therapy can affect your ability to make sperm or impact the ability of the sperm to fertilize an egg. The type, location, and duration of the treatment can affect whether those changes are temporary or permanent.

For some types of cancer, the reproductive organs are removed or damaged during surgery that is performed to remove the cancer.

Are there options for preserving fertility before cancer or other medical treatment that may impact sperm?

Yes! Sperm can be collected and frozen for later use before cancer treatment is started. This way, you may be able to have children after your treatment. This process is called cryopreservation or freezing. The kind of cancer you have and the treatments you will receive can determine what your options are.

What is involved in sperm collection?

Collecting sperm to freeze is typically a simple, noninvasive procedure. You will be shown to a private room or asked to collect at home, asked to masturbate to orgasm, and collect your semen in a special container.

A usual semen sample will contain around 5-20 million sperm per milliliter and is able to be divided into several vials for storage. Often, since sperm production is affected by many factors, you may be asked to collect more than one sample. This helps to improve your chances of being able to have a child later.

What if I can't give a sample?

Some people are unwilling or unable to collect a sample through masturbation but are otherwise able to have sexual intercourse. For them, a special condom may be used to collect semen during intercourse.

In the case of a blockage in the reproductive tract resulting in no sperm in the semen, sperm can be obtained through various procedures that remove them directly from the testicle or reproductive tubes located beside the testicles.

In some cases, retrograde ejaculation occurs. This is a

condition that causes sperm and some or all of the semen to collect in the bladder instead of being released through the tip of the penis. In that case, sperm can often be collected from the urine after intercourse.

If someone is unable to ejaculate (release semen during orgasm), there are options. Sperm can be surgically removed from the testicles and injected directly into an egg in a process called intracytoplasmic sperm injection (ICSI). For more information about ICSI, see the ASRM fact sheet titled Intracytoplasmic sperm injection (ICSI).

If someone is not able to ejaculate due to spinal cord injury, vibratory stimulation or electroejaculation can be used. For more information about these techniques, please see the ASRM fact sheet titled Surgical sperm recovery in men with spinal cord injury (SCI).

How is sperm cryopreserved?

Once collected, the semen sample is mixed with cryoprotectants. These are liquids that help protect the sperm against damage during freezing and thawing. The sample is then frozen by a slow-cooling method or a flash-freezing method called vitrification.

How long can sperm be stored?

Sperm can be stored indefinitely. Sperm that have been frozen for over 20 years have been used to create pregnancies.

Prepubertal testicular tissue cryopreservation

Because very few sperm are necessary to fertilize an egg in a dish, it is possible to obtain sperm directly from the testicle. In cases where very few sperm are produced, this may be the best option. This may be the only option for very young patients who have not yet reached a point of puberty where they have sperm in their ejaculate.

It is important to note that it will be necessary to have intracytoplasmic sperm injection (ICSI) when using testicular sperm. For more information, see the ASRM fact sheet titled Intracytoplasmic sperm injection (ICSI).

Before puberty, options are limited. In some research centers across the world, samples of testicular tissue are removed and frozen. When it's time to attempt pregnancy, the tissue is examined for stem cells. Stem cells are cells that have the potential to develop into many different kinds of cells. The hope is to isolate these few cells and mature them into functional sperm. So far, animal research is promising and human studies are ongoing. It is important to remember that this is an experimental procedure, and whether it will be successful is not known.

Conclusion

The most important thing to remember about fertility preservation is that it should be done prior to any cancer or other medical treatment that may impact fertility if possible. This will give you the best chance of having usable sperm.