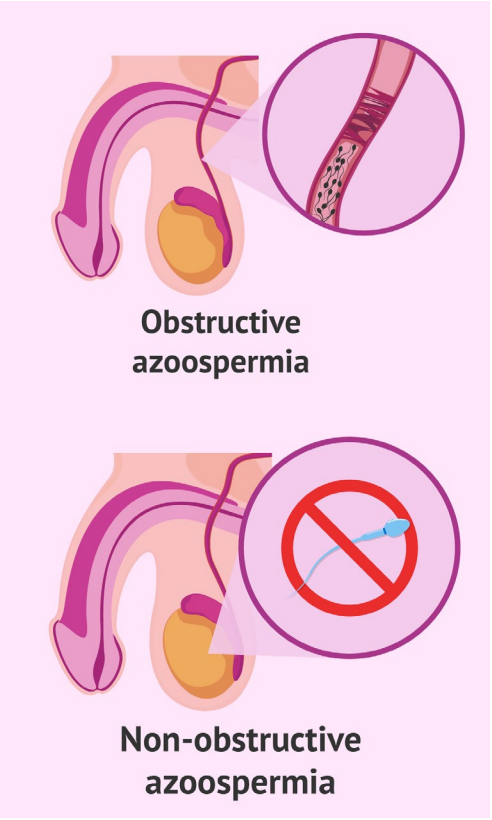
Sperm Retrieval Procedures

This handout explains azoospermia and the various sperm retrieval procedures that are sometimes performed for men undergoing treatment for male fertility issues. **For an electronic copy of this brochure and more information on Male Fertility, we encourage you to visit our website at www.MensHealthIN.com/services/male-infertility.** There we have several educational resources including video content and other handouts. If you ever have any questions or concerns, please feel free to call the Men's Health Center at (317) 564-5104.

Who would ever require a 'sperm retrieval procedure'?

Some men with male fertility issues may not ejaculate sperm. This is a condition known as azoospermia. There are essentially 3 types of azoospermia:



1. Azoospermia that is caused by a blockage or a **plumbing problem** where the sperm that are being made can't get out. This is known as obstructive azoospermia (OA).
    - Examples include men with a history of vasectomy, men with ejaculatory duct obstruction, and men who are carriers for the cystic fibrosis gene.
2. Azoospermia that is caused by a **partial production problem** where the man in question may not ejaculate sperm, but he may be producing it in very small amounts inside testicle itself. This is known as non-obstructive azoospermia (NOA).
    - Men with conditions like Klinefelter's syndrome, an AZFc Y chromosome microdeletion, or unexplained NOA may fall into this category.
3. Azoospermia that is caused by a **complete production problem** where the man in question doesn't and will never make any sperm. This is also known as non-obstructive azoospermia (NOA).
    - This includes men with AZFa and AZFb Y chromosome microdeletions. Men with Klinefelter's syndrome, AZFc Y chromosome microdeletions, and unexplained NOA may also fall into this category.

Most men with azoospermia, if they do have sperm inside the testicle, will require a sperm retrieval procedure in coordination with IVF to achieve pregnancy. Some notable exceptions include men with a history of vasectomy who have the option of a vasectomy reversal and men with ejaculatory duct obstruction who can sometimes have their blockages removed. **It's important to remember that all sperm obtained through sperm retrieval procedures MUST be used with IVF in order to achieve pregnancy and cannot be used at home or for IUI.**

Other men who may require a sperm retrieval procedure include men who ejaculate very few sperm or very poor-quality sperm. The decision to utilize sperm retrieval procedures in these men is very nuanced and made on a case-by-case basis.

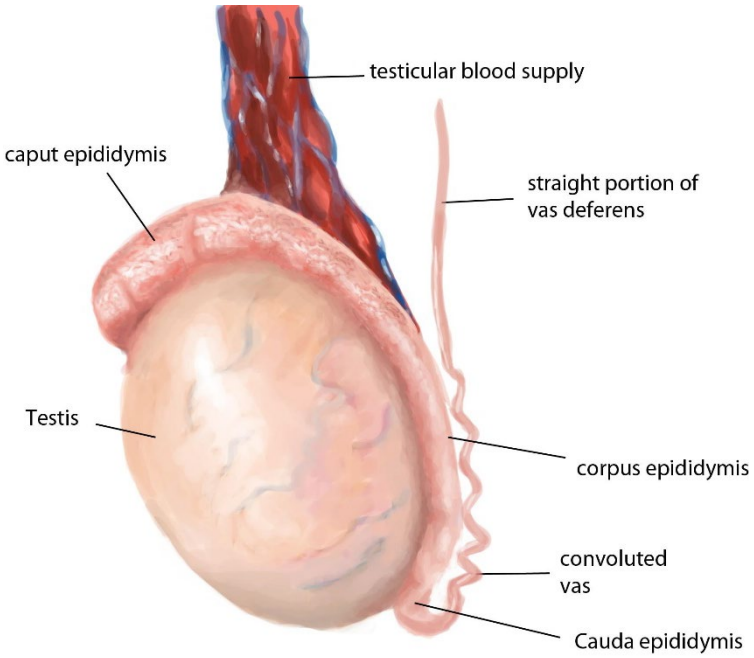
Tip: Men who are taking testosterone or other kinds of anabolic steroids will often have a type of non-obstructive azoospermia that has the potential to be reversed with medical therapy. Although there is no guarantee of success, these men are often able to avoid sperm retrieval procedures if testosterone and anabolic steroid use is their only issue.

What are the different types of sperm retrieval procedures?

When discussing the different types of sperm retrieval procedures, it's helpful to review the anatomy of the scrotum, its contents, and then break down sperm retrieval procedures by anatomic location. The scrotum contains several different structures that are involved in sperm production, growth, and transit from one location to the next.

The testicles are paired male genital organs that produce both sperm and the male hormone testosterone. The epididymis is a small, tubular structure attached to the testicle that serves as a reservoir where the sperm mature and are stored.

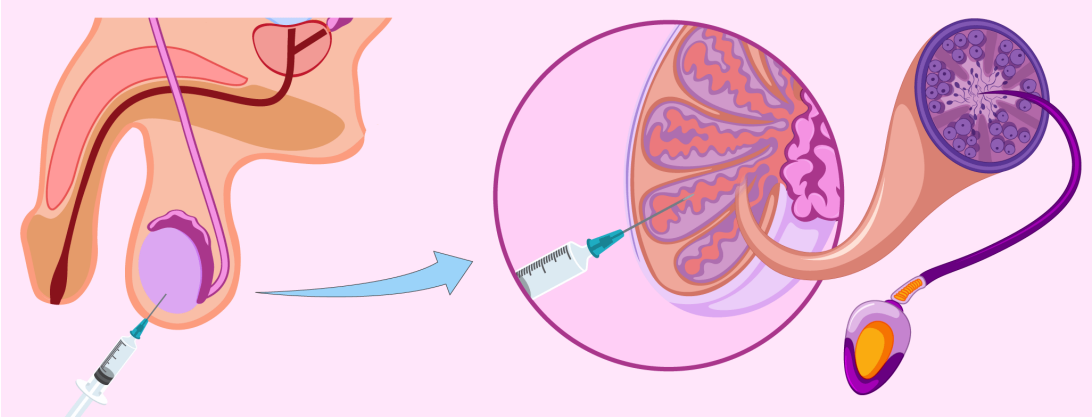
The vas deferens connects to the epididymis and is the tube through which sperm travel during ejaculation. The vas deferens is a part of a larger tissue bundle called the spermatic cord that also contains blood vessels, nerves, and lymphatics coming from the testicle.



When performing sperm retrieval procedures, sperm can be obtained from either the testicle itself or the epididymis. Let's start by discussing sperm retrieval procedures involving the testicle.

What is a testicular sperm aspiration (TESA)?

A testicular sperm aspiration, also known as a TESA, is one of the simplest sperm retrieval procedures that can be performed at the level of the testicle. After the testicle and the overlying skin has been made completely numb, a small needle is introduced into the testicle. This needle is attached to a syringe through which a modest amount of suction is applied to extract sperm.



A TESA can be performed in the office under local anesthesia or in a procedure room with a small amount of sedation. The benefit of a TESA is that it is quick and extremely easy to recover from. Men will often only need an occasional Tylenol dose to address any discomfort afterwards and typically return to work that same day.

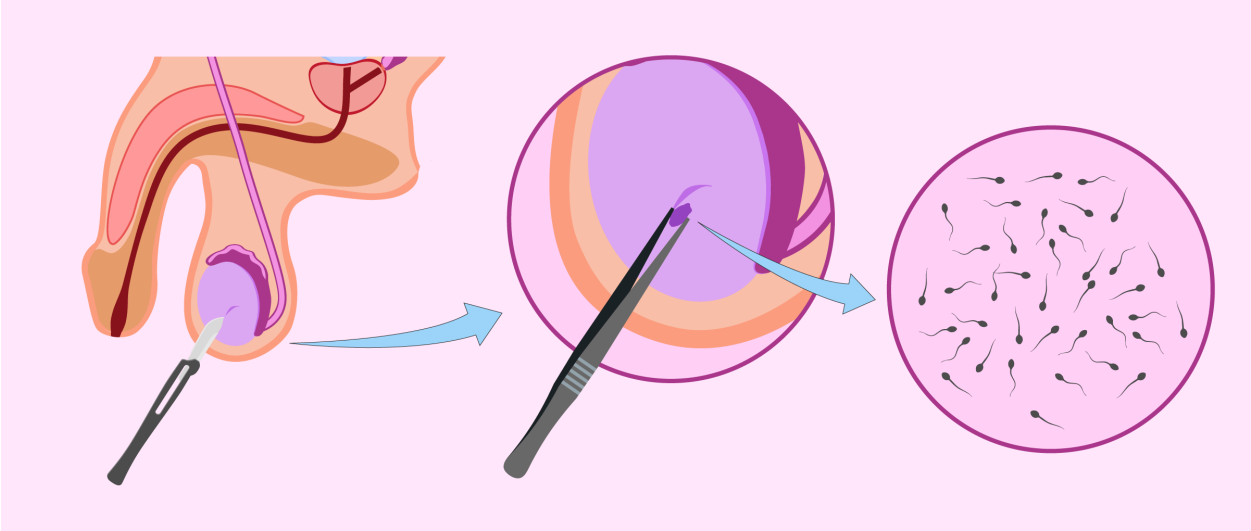
The drawback of the TESA is that, when done for the purposes of IVF, it often must be done the same day as a female partner's egg retrieval and will only yield enough sperm for that one attempt. That need for coordinated timing can introduce logistical challenges and the limited sperm yield means there typically isn't enough left over to freeze afterwards to use for future IVF cycles.

It's worth noting that the TESA can also be used as a diagnostic test for men in the clinic setting. The most common example is for men who have undergone vasectomy and are considering a vasectomy reversal or IVF, but they've also been on testosterone at some point. Because testosterone can interfere with sperm production, a TESA performed in clinic can confirm normal sperm production to help with decision-making.

What is a testicular sperm extraction (TESE)?

When we want to retrieve enough sperm from the testicle for freezing, we'll often perform what's known as a testicular sperm extraction or TESE. Also known as a testis biopsy, the TESE is the most common sperm retrieval procedure that we perform in male fertility.

During a TESE, a small opening is made in the scrotal skin overlying the testicle. Testicular tissue containing sperm is then removed directly from the testicle and the opening is closed with dissolvable sutures that disintegrate as things heal. This approach allows us to retrieve more sperm than with a TESA. As a result, a TESE often provides enough sperm to allow the option of freezing some for future use. This provides an immense amount of flexibility as sperm can be retrieved long before IVF is desired.



Like a TESA, a TESE can be performed in the office with complete comfort under local anesthesia or in a procedure room. It can be used to retrieve sperm in men who have known blockages (obstructive azoospermia) and in select men with suspected production problems (non-obstructive azoospermia). Although it bears mentioning that the decision to utilize a TESE in patients with suspected non-obstructive azoospermia is a topic of professional debate and made only on a case-by-case basis.

A TESE can also be a great option for men where it is unclear if they have obstructive or non-obstructive azoospermia. In these cases, a TESE can be both diagnostic (answering the question of obstructive vs non-obstructive) and therapeutic (potentially identifying sperm that can be frozen for later use in IVF).

What is a Micro-TESE (aka microdissection testicular sperm extraction or M-TESE)?

A micro-TESE is essentially a microscopic and more thorough version of a TESE. Where a TESE is like opening a book to a random page and reading it, a micro-TESE is like reading every single word, cover to cover. It is an exhaustive look through both testicles using a high-powered surgical microscope.

Micro-TESEs are typically reserved for men who have known non-obstructive azoospermia who don't have a confirmed AZFa or AZFb Y-chromosome microdeletion. That means they could either have a partial production problem where they may have a small amount of sperm in the testicles, or a complete production problem where they don't produce any sperm. *We just can't say for certain looking at bloodwork alone.* Since the micro-TESE is a comprehensive physical look through both testicles, it offers the final answer to the question: does this man produce any sperm at all?

The challenge with the micro-TESE is that the amount of sperm that is found (if any) is typically very small. So small, in fact, that any sperm that are identified typically need to be used for IVF immediately. As we talked about with a TESA earlier, small amounts of sperm usually don't freeze very well. This means that the female partner often must undergo an egg retrieval as part of her IVF cycle at the exact same time that the male partner is undergoing his micro-TESE.

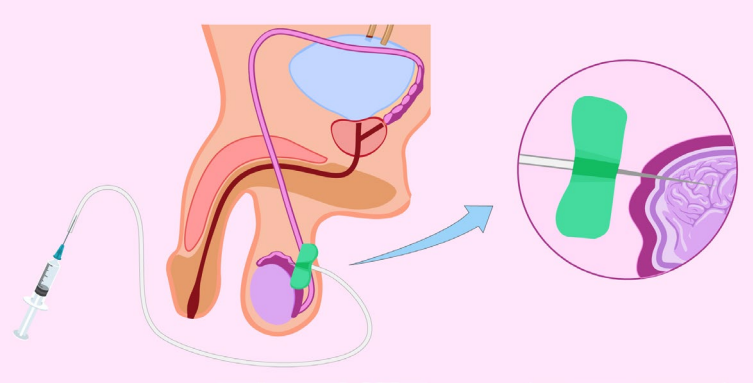
This unfortunate reality presents a challenge because it means that couples with non-obstructive azoospermia who desire a micro-TESE need to commit to a full IVF cycle without knowing whether or not the male partner has sperm. Although there are options to mitigate this risk, like having donor sperm available as a back-up option, for many couples this can feel like a significant gamble.

Ultimately, the decision to pursue a micro-TESE is a complex one that should only be made after a thorough discussion with both the male and female fertility care teams involved.

What is a percutaneous epididymal sperm extraction (PESA) or a microscopic epididymal sperm extraction (MESA)?

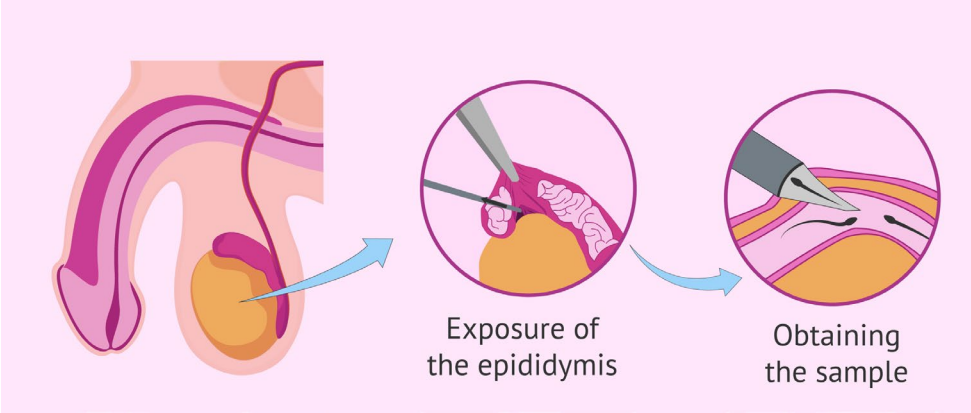
So far we've covered all of the sperm extraction procedures that are performed on the testicle. Now let's move on to the epididymis. As we mentioned earlier, the epididymis is a small, tubular structure attached to the testicle that serves as a reservoir where the sperm mature and are stored.

Because the sperm in the epididymis are more mature than sperm in the testicle, some IVF labs will prefer them in select circumstances. So, for men with confirmed obstructive azoospermia, we'll sometimes obtain sperm from the epididymis rather than the testicle.



This is done via two possible approaches. The first is known as percutaneous epididymal sperm extraction, or a PESA. This is almost identical to a TESA, but instead of using a needle to remove sperm from the testicle, it's used to target the epididymis. Much like a TESA, a PESA usually only yields enough sperm for a single try at IVF and doesn't always yield enough to be frozen for later.

If men desire to obtain enough sperm to be frozen for later, we'll make an opening in the skin to visualize the epididymis directly and either use an operating microscope or surgical magnifying glasses known as loupes. This approach is known as a microscopic epididymal sperm aspiration or MESA.



Who should I call if I have any questions or concerns?

If you ever have any questions or concerns, please don't hesitate to call us at (317) 564-5104. If you want to learn more about male fertility, please visit our website at **www.MensHealthIN.com/services/male-infertility**. There we have several educational resources including video content and other handouts. Thanks to www.Invitra.com for use of their excellent illustrations in this handout. If you still need to schedule your consultation, call our scheduling office at (877) 362-2778 to make your appointment today!