

## NON-SURGICAL SPERM ASPIRATION (NSA) & TESTICULAR BIOPSY FACT SHEET

### Background

Non-surgical sperm aspiration (NSA), performed in our clinic under sedation, allows us to easily and quickly obtain adequate numbers of sperm for ICSI in many men who have no sperm in their semen because of vasectomy or other causes of blocked ducts, in men who cannot ejaculate (including men with spinal cord injury), and in some men who do not have any duct obstruction (non-obstructive azoospermia).

Men who lack sperm in their ejaculate frequently have at least some sperm in their testicles, where sperm are made. Testicular sperm can fertilize eggs if they are injected directly into eggs obtained for in vitro fertilization (IVF) through a process developed in Belgium called intracytoplasmic sperm injection (ICSI). While the ejaculate normally contains 100 to 300 million sperm, aspiration of as few as 100 to 200 sperm by NSA has been enough to achieve pregnancy when it is combined with ICSI.

Before the development of NSA, men with no sperm in their ejaculate had to undergo surgery to remove sperm either from their testes or from the tubes connected to the testes (vas deferens or epididymis). The operation required a hospital stay and lengthy recuperation. Non-surgical sperm aspiration is rapid, performed right at our Center, does not require hospitalization, is pain-free when done under sedation, and recovery is virtually immediate.

The technique has been immensely helpful to men who have had vasectomies and later decide that they want to have children - perhaps because they have remarried. Reversing a vasectomy by having bypass surgery is possible, but the operation is frequently not successful, especially for men with longstanding vasectomies. Additionally, sperm quality after vasectomy reversal is often reduced and ICSI is required even if sperm appear in the ejaculate. For many men, non-surgical sperm aspiration eliminates the need for vas reversal surgery.

NSA will also help infertile men who lack sperm in their semen because the route out of the testes has been blocked by prior infection or congenital lack of development, as well as men who have had their prostates removed and can no longer ejaculate but do make sperm. Men who cannot ejaculate due to spinal cord injuries or neurological conditions like multiple sclerosis can also become fathers through the new technique. There is also a large group of infertile men who simply produce no sperm and other men who have only dead sperm in their semen although their ducts and ejaculatory process are normal, however, such men may have some living testicular sperm that can be obtained through NSA.

Men with non-obstructive azoospermia, that is, men with no sperm in the ejaculate and no obstruction in the ducts leading from the testicle to the outside often need surgery to find the sperm. We partner with the urologists to have them perform testicular biopsy often with the aid of microsurgery to identify tissue contain a few sperm. Many men in this category will not have any sperm and must resort to using donor sperm or adoption. The biopsy also allows the pathologist to aid in the diagnosis.

### Technique

NSA performed under sedation is painless and rapid. We use a tiny needle to extract sperm directly from the testis or the epididymis (part of the ducts just outside of the testicle).

Testicular biopsy for men with non-obstructive azoospermia should be performed the day before or the day of egg retrieval to allow the use of fresh, non-frozen sperm when possible. Sometimes we must perform surgery in advance of the egg retrieval and we can freeze the specimen with the expectation of success most of the time.

NSA must be done in conjunction with ICSI because testicular sperm cannot enter eggs by themselves. We schedule NSA the same day as the egg retrieval for IVF. After egg retrieval and sperm aspiration, our embryologists inject each egg with a single sperm. We transfer embryos back to the uterus three to five days following fertilization; with cryopreservation (freezing) of additional embryos as requested.

For some men, a single NSA procedure may yield enough sperm to permit freezing for subsequent ICSI attempts. However, survival of small numbers of thawed testicular sperm is unproven and repeating an NSA for another ICSI cycle is quite easily accomplished. You must notify us in advance if you want any extra NSA sperm frozen and stored. You must accept the cost for cryopreservation and storage of the sperm. Because so few sperm are actually frozen and many of those will die during the freeze-thaw process, you may not have any viable sperm when the sample is thawed.