THE FERTILITY ALLIANCE

MALE FERTILITY PROBLEMS

Male fertility problems have a variety of causes. The most common cause is that the man's semen has too few normal sperm to fertilise the egg. The first step in identifying the male factor fertility problem is a semen analysis.

A semen analysis should be carried out for any couple seeking treatment for fertility problems regardless of whether there is an identified female problem or a suspected male factor problem. It is a simple procedure which may reveal important information. Even if the male partner has previously fathered children, a semen analysis is necessary since problems may have developed in the intervening time.

A semen analysis includes the following tests:

- Semen volume and appearance
- Sperm concentration
- Number of sperm that are swimming
- Number of sperm that are normally shaped

Sperm concentration is usually considered to be the most critical factor and is expressed as the number of million sperm per millilitre of semen. Sperm motility, or the number of sperm that are swimming, is usually expressed as a percentage of the total number of sperm.

Progressive motility is a more accurate value as it measures the percentage of sperm moving in one direction only (instead of round in circles) as these are the most likely sperm to fertilise the egg. Progressive motility is the most useful test from a semen analysis to predict fertility treatment success.

The number of sperm that are normally shaped, i.e. with normal morphology, is expressed as a percentage of the total number of sperm in the ejaculate.

Understanding semen analysis results

Semen analysis is used to assess different aspects of sperm health. The main measures include:

- **Semen volume** – the amount of semen produced.

- **Sperm concentration** – the number of sperm per ml of semen
- **Total sperm number** – the total number of sperm in the ejaculate.
- **Sperm motility** – the proportion of sperm that are swimming.
- **Progressive sperm motility** – the proportion that are swimming forwards
- **Sperm vitality** – the proportion of sperm that are alive.
- **Sperm morphology** – the proportion of sperm that have a normal shape.

If the result is abnormal

If the first semen analysis is abnormal, most guidelines (such as NICE) recommends offering a repeat confirmatory test. This should ideally be carried out around 3 months later, allowing time for another complete cycle of sperm production.

If there is a major sperm deficiency, such as no sperm present in the semen or a very low sperm concentration, the repeat test should be carried out sooner.

It is important to discuss semen analysis results with a healthcare professional, who can interpret the results alongside the individual's medical history and fertility circumstances.

Causes of male fertility problems
The causes of male fertility problems may be genetic or physical.

Genetic causes
The most common genetic abnormality leading to infertility in the male is Klinefelter Syndrome where the man has an extra X chromosome. Usually, a female has two X chromosomes (XX) and a male has one X and one Y (XY). Men who have Klinefelter Syndrome are born with an extra copy of the X chromosome (XXY). Most men with Klinefelter Syndrome produce no sperm at all. It is untreatable and generally patients can only be offered donor sperm.

In some men, sperm are not ejaculated because of obstruction in a tube called the vas deferens which carries the sperm from the testis to the ejaculate. This tube may be obstructed on one side or on both sides. In the majority of these cases this condition is the result of genetic mutation which may also give rise to Cystic Fibrosis. These men may have sperm retrieved surgically and may achieve pregnancies using ICSI. However, it is very important that these couples receive genetic counselling and genetic screening as their offspring may be at risk from Cystic Fibrosis.

Physical causes
Apart from congenital obstructions of the reproductive tract, obstructions may also result from infection or from surgery or injury. If a man apparently has no sperm in his semen it is important to establish whether this is the result of an obstruction or whether his testes are not making sperm. A simple hormone test will usually give this information. If

the obstruction occurs on one side only, then the sperm concentration may be reduced. If the obstruction is on both sides and no sperm are being ejaculated, sperm can be retrieved surgically directly from the testis, in a tiny biopsy. This is performed as an out-patient procedure under local anaesthetic. However, because the numbers of sperm retrieved are usually low, and these sperm may be immature, successful treatment is only likely with ICSI.

Other causes
There are other sperm problems that cannot be identified by semen analysis. This means that a normal semen analysis does not guarantee fertility. In recent years, many clinics have started to offer a new test which measures sperm DNA damage. However, the use of this test is not currently recommended by guidelines (such as NICE). Therefore, if the test if offered to you, you may have to pay privately for it.

Treatment
There are very few cases of male infertility that can actually be cured. Generally, when we refer to treatment we mean techniques that enable us to circumvent the problem.

Assisted conception treatment such as IVF may enable a man to achieve a pregnancy with his own sperm, however he will still be infertile and will need assistance if he wishes to have more children.

IVF is successful with low numbers of normal motile sperm because the sperm and egg are placed together in a petri dish in the lab. This makes it must easier for the sperm to fertilise the egg. Success rates with IVF vary with the severity of the sperm problems.

If the sperm are of low quality, an advance form of IVF called intracytoplasmic sperm injection (ICSI) can be used instead. This is a process whereby a single sperm is injected directly into the egg and can be carried out even when there are very few sperm present in the semen. ICSI can be used very successfully with sperm that have been surgically retrieved from the testis or from the epididymis. This technique has superseded all other micromanipulation techniques and has become the treatment of choice where fertilisation fails with conventional IVF.

Since this technique has allowed men to father children who previously would have been unable to do so, concerns have been raised about the inheritance of male infertility, as well as the possibility of other genetic defects. To date, research suggests that there is a slightly raised incidence of sex chromosome abnormalities in children born as a result of ICSI. This is not a result of the technique, but rather a result of the presence of genetic defects in the father which caused his infertility in the first place. However, the incidence is still very low, at around 3%. Couples who need treatment by ICSI should make sure they understand the genetic implications by asking their fertility team all the questions they have.

Our understanding of male infertility and of sperm function has increased tremendously over the last decade. The development of ICSI means that there are now very few men for whom there is no possibility of fathering their own genetic children. However, in terms of treatment leading to a cure, very little progress has been made. There are virtually no reliable drug treatments and very little that can be done to increase sperm concentrations.

Many patients ask whether there is anything they can do to improve their sperm. The answer is generally no other than to live a normal healthy lifestyle. General tips might include:

- Stop smoking (if you are a smoker)
- Reduce alcohol consumption
- Wear loose underwear
- Eat healthily (five portions of fruit and vegetables per day)

Future research is directed at improving results with the existing treatments, and also to find ways to improve fertility so that such invasive techniques such as ICSI or even IVF are not necessary.