

Investigations of Infertility

Hormone Assessment of the Female

The first step in the investigation of a woman's fertility is to establish whether or not she ovulates (produces an egg) every month. This can normally be confirmed by performing blood tests to measure the level of the progesterone hormones at specific stages of the woman's cycle, ideally day 21 of a regular 28 days cycle.

It is also important to check ovarian reserves in all the ladies by testing the pituitary hormones mainly Follicle Stimulating Hormone (FSH) and Lutinising Hormone (LH), and the ovarian hormone Oestrogen in the first few days of the cycle. In addition to the newly recognised Markers of ovarian reserve such as Anti-Mullarian Hormone (AMH) it is possible to identify the best approach to start the treatment. .

Laparoscopy

If conception is to occur easily and naturally, it is essential for a woman to have patent (open) and undamaged Fallopian tubes in order for the sperm and egg to meet. In order to check the patency of the Fallopian tubes as well as the condition of the uterus and ovaries, a Laparoscopy can be performed. This procedure involves inserting a small telescope known as a laparoscope through the abdominal wall when the pelvic organs can be clearly seen via a fibro-optic camera. A laparoscopy is performed in the operating theatre, usually as a day-case under a general anaesthetic.

Hysterosalpingogram (HSG)

A hysterosalpingogram may also be used to check whether or not the Fallopian tubes are blocked. This is an x-ray procedure involving the injection of a special dye through the cervix and into the uterus. The passage of the dye through the Fallopian tubes can be observed on the x-ray. If the dye fails to spill out through the end of the tubes, this indicates that they are blocked or that a spasm has occurred and needs further investigation. (Laparoscopy and Dye Test).

Hysteroscopy

A small telescope connected to a camera is inserted through the cervical canal. This is done either under general anaesthetic or under sedation as a day case. The uterine cavity will therefore be seen and examined under direct vision. Pathology best seen with this technique includes sub-mucous fibroids, i.e. fibroids developed within the uterine cavity, endometrial polyps or adhesions.

Ultrasound Scan

Based on the principle of sonar, a Transvaginal Scan (TVS) is a non-invasive technique allowing internal organs to be seen on a screen. A small probe is inserted in the vagina so the uterus and both ovaries can be seen.

Transvaginal scan is a major tool to monitor ovarian stimulation during ovulation induction particularly in IVF, to check patients for fibroids or ovarian cysts and also to monitor pregnancy.

Semen analysis

It is the first and most indicative tests for the male partner. Once it is confirmed to be normal it might not need to be repeated until one year later. If it is abnormal we don't take the results as conclusive before another test is done in about three months time.

Production of semen samples

Semen samples can be produced by masturbation at home but brought in to the cytology lab in East Surrey Hospital within one hour of production so that the analysis can take place within 1-2 hours after production. However, there is a possibility of using a special production room in the hospital and you need to enquire in the lab for that.

Please make sure that you do not ejaculate for 3-5 days prior to producing a semen sample for analysis. This is important as it will ensure that the sample you produce on the day is at its optimum in terms of numbers and quality.

No appointments required to deliver the semen sample to the lab but samples are only accepted during weekdays from 9 am to 3 pm.

Results

The results of your semen analysis will be available after 5 to 7 days and will be discussed with you by your consultant. We do not give results out over the telephone, although you may request a written report.

The Analysis

The following will be assessed during the semen analysis according to WHO criteria: the volume of the sample, the number of sperm present within the ejaculate (the sperm count); the percentage of sperm that are moving (the motility) and the rapidity with which most of them are moving (Progression); the number of sperm that are normally formed (the morphology); whether or not there is an evidence of anti-sperm antibodies present; and whether or not there is any infection present within the sample.

What is a 'normal' semen analysis result?

A normal semen analysis will show the following: a semen volume of at least

2 mls; a sperm count of at least 20 million sperm per ml; at least 50% of the sperm will be motile progression 3 or 4; (25 % rapidly motile progression 4), at least 15% of the sperm will be normally formed and less than 10% of the sperm will be affected by anti sperm antibodies.

The degree of variance from these accepted normal values will be assessed and the implications explained by your consultant during a follow-up consultation.

Repeated Centrifugal Analysis (RCA)

Some men with infertility problems are told that it is not possible to find any sperm in the ejaculate following routine semen analysis. This condition is called azoospermia. If these men wish to father a child using their own sperm it is then usually necessary to undergo a surgical procedure to try and extract sperm directly from the epididymis or from the testis. (PESA or TESE)

However, this surgery may not always be necessary. In some cases men who have been told that they have azoospermia do in fact produce some sperm that can be found in the ejaculate. The sperm is produced in very minute quantities and as a result can be missed during a routine semen analysis. Using advanced analysis techniques it may be possible for the embryologist to recover a few sperm from the ejaculate, which can then be cryopreserved (stored). This is carried out on several occasions and it may be possible to store enough sperm to be used in a treatment cycle. If sperm is collected using this method there will not be sufficient sperm to be able to fertilise eggs in the normal way and Intra-cytoplasmic sperm injection (ICSI) will always be required.

This technique is called Rapid Centrifugal Analysis (RCA). Firstly, the man will need to give several ejaculates for analysis over a period of weeks. Each of these ejaculates is then prepared by spinning in a centrifuge at very high speed. This concentrates all the cells in the sample, including any sperm cells, into a very small volume. It may then be possible for the embryologist to identify a few sperm using a very powerful microscope. If any sperm are seen then the ejaculate will be cryopreserved for future use. This procedure is done in the Bridge Centre in London

Not all men who undergo this procedure will be successful. We have only recently started to offer this technique to patients and we are not able to say how successful it will be. However, we expect that about 25% of men will be able to collect enough sperm to be able to use in an ICSI cycle.

If these sperm are used during ICSI then around 65% of the eggs will fertilise following the injection of a single sperm. Pregnancy rates following IVF/ICSI are currently 22% - 35%, in different female age groups, per embryo transfer.

Hormone Assessment of the Male

In cases of azoospermia, blood analysis of hormones (FSH, LH and testosterone) will be taken. This will tell us if there is a blockage or if there is no sperm production within the testis. In the first instance, sperm can be retrieved through PESA or MESA or surgery might correct the problem. In the second instance, 50% of the cases, Testicular Sperm Extraction (TESA) will retrieve enough sperm to fertilize the egg. Exceptionally if the levels of testosterone are too low, in the most severe cases hormone replacement therapy will be advised.

Screen for Cystic Fibrosis

Cystic Fibrosis is the commonest genetic disease amongst Caucasians, 1 in 25 persons being carriers of this defective gene but being otherwise normal. However, the incidence of Cystic Fibrosis is a lot higher in men having congenital bilateral absence of vas deferens which causes Azoospermia thus justifying a systematic screening.

Testicular Biopsy

Testicular Biopsy involves taking one or several small samples of the testes - either for analysis, or for the recovery of sperm in the most severe cases of azoospermia, for immediate test or cryo preservation for use later.