2 CLINICAL SERVICES OFFERED

2.3 Andrology

Infertility is a common problem and almost 1 in every 6 couples will have difficulty conceiving naturally and be referred for fertility investigations. In almost 30% of all men referred, 'sperm dysfunction' or 'male factor' infertility is the most common diagnosis.

A comprehensive and high-quality semen analysis is therefore essential to the diagnosis and treatment of male factor infertility, and to the treatment of the infertile couple as a whole.

The laboratory also performs Post Vasectomy Semen Analysis to confirm the presence or absence of sperm in the ejaculate following a vasectomy operation.

2.3.1 Diagnostic Semen Analysis – Fertility /Reversal of Vasectomy

Diagnostic Semen Analysis is performed in accordance with the guidance set out by the World Health Organisation 2021, the British Andrology Society (BAS) and the Association of Reproductive and Clinical Scientists (ARCS). The laboratory subscribes to the National External Quality Assurance Scheme (UKNEQAS) for reproductive medicine, which includes semen analysis.

Diagnostic Semen Analysis involves assessing a number of parameters. It should be noted that the "normal values" we report against are to be considered as guidelines only and should not be viewed as clear cut threshold values against which treatment is solely directed.

The laboratory assesses the following parameters: -

- **Liquefaction / Viscosity**

A qualitative assessment of how liquefied the ejaculate has become and is assessed as soon as is practicable after arrival of the sample. Liquefaction and viscosity are reported in a joint comment as either 'complete' or 'incomplete'. High viscosity and incomplete liquefaction can interfere with the determination of sperm motility and sperm concentration.
(Please note that this parameter is not included in our scope of UKAS accreditation).

- **Sperm Volume**

The sample volume is the amount of semen produced (and is measured in ml but ascertained from weighing the sample). Sample volume should be greater than or equal to 1.4 millilitres.

- **Seminal pH**

The pH of the sample measures the acidity or alkalinity using pH paper strips, is assessed as soon as is practicable after arrival of the sample. and should be greater than or equal to 7.2.

- **Sperm Concentration (sperm count)**

Reported as millions of sperm per millilitre of semen. Normal semen samples are those reported with a concentration of 16 million/ml or more. The Total Number of Sperm contained within the ejaculate is measured in millions of sperm per ejaculate, and a total count in the ejaculate of 39 million or more sperm is considered normal.

- **Sperm Motility**

Sperm are graded on their ability to move in a progressive manner, and the speed at which they do this. The fast forward-swimming sperm are the most fertile. This is reported as a percentage of sperm counted and divided into the following 4 categories: -

- Rapid progressive motility
- Slow progressive motility
- Non-progressive motility
- Immotile

Those sperm which are "Progressively Motile" (rapid and slow together) should account for 30% or more of the total sperm population.

"Non-progressively Motile" sperm (which exhibit tail motion but are not moving forwards) and those which are "Immotile" are also reported as a percentage of the total sperm population.

- **Sperm Morphology and the Teratozoospermia Index (TZI)**

The proportion of sperm in the sample that have a normal or more typical appearance is assessed from a stained Papanicolaou preparation, according to strict criteria. This is reported as a percentage of normal forms detected. A sample with less than 4% normal forms reported should be considered as sub-fertile.

The TZI is one of the indices of multiple sperm defects (number of abnormalities per sperm). This is useful in understanding if there are issues regarding spermatogenesis and can be correlated to fertilisation rates. The higher the TZI number, the higher the number of abnormalities of sperm (maximum of 4). A TZI of ≤1.5 is considered normal.

- **Agglutination**

A visual assessment of the number of motile sperm cells that are 'sticking' to each other and preventing progressive motility. Agglutination can be indicative of anti-sperm antibodies which may impair male fertility potential, however the visual assessment we do is not a diagnosis of this. No specific measurement will be indicated within the report, only the presence of agglutination if detected.

- **Round Cells**

A quantitative assessment of the number of round cells in the ejaculate. (NB: No differentiation is made between non-sperm cells and leucocytes)

Fertility Semen Analysis reports are standardised in order to minimise procedural variation and are sent to the referring practitioner within 7 working days.

Although, there are strict guidelines for the measurement and quality control of semen variables, they are not an absolute guide to a man's fertility and no one parameter should ever be considered in isolation. Procedural errors are minimised by standardised methods for collection, analysis and reporting but errors cannot always be excluded. An appraisal of the overall 'balance' of the sample is much more indicative of fertility potential and should be considered alongside any investigations of the female partner.

If one or more parameters are outside of the "normal range", the patient may be referred for a repeat semen analysis. Semen quality can vary significantly and diagnosis of sperm quality should be formed on the results of more than one sample **See Section 9.7 of the Handbook for further details.**

2.3.2 Semen Analysis – Post Vasectomy

Semen testing to confirm the success (or otherwise) of a vasectomy operation is absolutely essential. Although PVSA is a simplified semen analysis procedure, it is still important that strict guidelines for sample production are adhered to with regard to hygiene, abstinence, the use of the correct container, and production by masturbation.

The laboratory analyses and reports PVSA samples in accordance with the latest updated guidance set out by the 2016 Laboratory Guidelines for PVSA. See Section 9.7 of the Handbook for further details on sample collection.

The laboratory reports the following results: -

- **No spermatozoa seen in a 50 microlitre aliquot of the ejaculate.** This is not confirmation of azoospermia, only that the number of sperm likely to be present in the sample is below the level that the laboratory can confidently detect.
- **X number of non-motile spermatozoa seen in a 50 microlitre aliquot of the ejaculate**.
- If motile sperm are observed, a full sperm concentration and motility assessment will be performed according to standard WHO 2021 procedures.
- Where examination of a sample occurs outside the recommended parameters, then this will be noted in the report and referenced to the 2016 guidelines.

If all recommendations have been met and no sperm are observed in the first PVSA sample, then it is acceptable to confirm vasectomy success. However, it is not unacceptable for clinicians to request a second PVSA for their patient.

If sperm are present in a patient's first PVSA sample, then a full semen analysis investigation must be requested in order to establish whether the sperm are motile. See Section 9.7 of the Handbook for further details on sample collection.

2.3.2.1 Special Clearance

It is the responsibility of the requesting clinician to grant clearance following a vasectomy. Where small numbers of non-motile sperm remain present in the ejaculate, “special clearance” can be given at the discretion of the clinician, and the patient must be appropriately counselled.

Special clearance can only be given by the clinician when 2 consecutive PVSA samples have been examined within 1 hour of production (after a Full Semen Analysis Investigation) and contain less than 100 000 non-motile sperm/ml.