



Semen analysis

ANDROLOGY

INFORMATION FOR DOCTORS

LABPOINT

Semen analysis

The semen analysis is the first examination performed to analyse male fertility status. It provides information about the integrity of the spermatogenesis and the chances of natural reproduction. The quality of the sperm also depends on the secretions of the epididymis, prostate and seminal vesicles. For this reason the spermiogram is an important tool for the diagnosis of underlying urogenital diseases and their possible treatment. It also contributes to the assessment of the patient's general health.

However, it is not the only tool for assessing male infertility. It must be accompanied by a medical history, a detailed medical examination and additional semen analyses such as the sperm DNA fragmentation test described below.

The parameters analysed in a spermiogram as well as the normal duration of spermatogenesis of 74 days can be influenced by a variety of factors both intrinsic (age, genetic diseases, hormonal or functional disorders of the urogenital tract) and extrinsic (smoking, alcohol abuse, environmental factors, fever, infections, stress, etc.).

For these various reasons, it is advisable to have a second spermiogram performed after an interval of three months if the results of the first spermiogram are pathological.

APPOINTMENT

The appointment is made with the nearest LabPoint laboratory by the patient himself by telephone or e-mail.

LabPoint patient leaflets explain how the semen analysis is normally performed, and these leaflets are available for you to hand out to the patient.

LabPoint staff can also e-mail them directly to your patient upon request.

INSTRUCTIONS FOR SEMEN COLLECTION

- The last ejaculation or sexual intercourse must have taken place at least 2 days and at most 7 days (ideally 3 or 4 days) before the collection.
- It is mandatory that sperm collection is performed by masturbation in the special rooms in our LabPoint laboratories (highly recommended option) or at home. In the latter case, the sample must be delivered to the LabPoint laboratory according to the exact schedule and procedures detailed in the "Instructions for a proper semen collection".

SUGGESTED TESTS

INITIAL SPERMIOGRAM including:

1. Assessment of the macroscopic parameters, i.e. pH, colour, viscosity and liquefaction, presence of white blood cells, and the microscopic parameters of the semen, i.e. concentration, total sperm count and sperm motility and morphology (price: CHF 146).
2. MAR test is used to detect the presence of anti-sperm antibodies on the surface of the sperm cells. If these antibodies are found in very high concentrations, it can

impair the spontaneous fertilisation capacity of the sperm. These antibodies are produced when the blood-testis barrier is disrupted by an obstruction, infection or trauma, and their presence indicates an immunological aetiology for infertility (price: CHF 32).

3. Standard microbiological (semen culture) testing of mycoplasma and ureaplasma (price: CHF 94; price if positive: CHF 186) and testing for Chlamydia trachomatis and Neisseria gonorrhoeae by PCR (price: CHF 71).

BASIC SEMEN ANALYSIS (price: 146 CHF)

Which includes the basic macroscopic and microscopic tests described in the previous section without the testing of auto-antibodies or bacteria, although this can be requested separately. This analysis is ideal as a follow-up test three months after an initial spermiogram.

ADDITIONAL ANALYSES (not covered by basic Swiss LaMal health insurance)

1. VITALITY TEST (Price: 60 CHF)

This test assesses the percentage of live, membrane-intact sperm cells, the latter being an important parameter for them to perform all their own functions. This test is useful in asthenozoospermia to differentiate live sperm cells from immotile sperm cells. A

high percentage of live but immotile sperm cells is a sign of structural defect in the flagella (Chemes & Rawe, 2003). A high percentage of immotile, non-live sperm cells can be attributed to epididymis diseases (Correa Perez, 2004).

2. SPERM DNA FRAGMENTATION TEST (Price: 200 CHF)

This is an important test to complement the semen analysis, as it helps to identify underlying primary disease interfering with male fertility. Intact sperm DNA is a sign of good fertilising capabilities and supports embryonal development. A high rate of DNA fragmentation leads to reduced conceptive capabilities, and an association between high fragmentation and early abortion has been observed (Chohan et al., Androl., 2006). Even patients with normal semen parameters may have high levels of DNA fragmentation (Bareh et al., 2016). Risk factors causing increased sperm DNA fragmentation include smoking cigarettes, exposure to toxic and radioactive substances, diseases such as varicoceles, as well as older age or being subject to oxidative stress (Casanovas et al., 2019; Cho, Agarwal, Arab & Androl, 2018).

men's HEALTH

FURTHER SEMEN ANALYSIS

1. POST-VASECTOMY SEMEN ANALYSIS (price: 45 CHF)

Basic semen analysis after the centrifugation of the sample to check for the presence of residual immotile sperm cells approx. 3 months and after at least 30 ejaculations after the surgery. Physicians are advised to repeat the investigation twice, and if necessary even three times, if sperm cells are still found in the second test.

2. IN THE URINE (price: 76 CHF, or 206 CHF with a semen analysis)

A useful test for retrograde ejaculation. In such a case, semen is released into the bladder instead of outside the body via the urethra or if the vas deferens is obstructed. Retrograde ejaculation can also be fractional, with signs of abnormal macroscopic and microscopic parameters in the semen analysis, such as an acidic pH (< 7.2), reduced volume (< 1 mL) or asthenozoospermia.

MICROBIOLOGICAL EXAMINATION

1. BASIC SEMEN CULTURE (price: 94 CHF; if positive, 186 CHF)

Cultures to identify the presence of pathogenic or potentially pathogenic bacteria, e.g. Escherichia coli, enterococci, streptococci, mycoplasma and ureaplasma are important in providing information about abnormal semen parameters which may impair the fertilising capabilities of the sperm cells. This test may also be useful in acute or chronic prostatitis and infections of the seminal vesicles.

2. STANDARD SEMEN CULTURE (total price: 165 CHF; if positive, 257 CHF).

In addition to the basic culture described above, this culture tests for Chlamydia trachomatis and Neisseria gonorrhoeae via PCR. These sexually transmitted bacteria can cause significant inflammation and dysfunction both in men (e.g. retrograde ejaculation) and in women, contributing to cases of serious internal urogenital complications in 10% of cases.

Positive Chlamydia trachomatis results are reported to the Swiss Federal Office of Public Health (BAG).

This test may also be done in the case of acute or chronic prostatitis and infections of the seminal vesicles.

3. EXTENDED SEMEN CULTURE

In addition to the basic culture, this culture covers a whole panel of bacteria via multiplex PCR including Chlamydia trachomatis, Neisseria gonorrhoeae, mycoplasma, ureaplasma and trichomonas (price: CHF 254 for the PCR panel). It can also be used as an STI (sexually transmitted infection) panel in the event of acute or chronic prostatitis and persistent urogenital infections.

SPERM PREPARATION

1. CAPACITATION via DENSITY GRADIENT or SWIM-UP (price: 60,30 CHF).

Sperm capacitation refers to the physiological changes that sperm cells naturally undergo to acquire the ability to fertilise an egg. This means that only some of the ejaculated sperm cells are actually able to fertilise eggs; by using sperm selection techniques their number can be quantified.

2. SEMEN PREPARATION FOR INTRAUTERINE INSEMINATION (IUI) (Price: 208,50 CHF).

Many gynaecologists find it important to support their own patients who wish to become pregnant with basic assisted reproduction techniques such as IUI. The LabPoint andrology laboratories are at your disposal to help with the collection of semen samples from the partner and, after performing the capacitation, to transport them according to the appropriate instructions to the treating gynaecologist's clinic for the IUI.

REFERENCE VALUES AND INTERPRETATION

The list below comprises the international reference values as per the new guidelines from 2021 (WHO laboratory manual for the examination and processing of human semen, 6th edition).

PARAMETER	REFERENCE VALUE	DEFINITION
Semen volume	> 1.4 mL	If <, hypospermia or hypoposia
pH	> 7.2	/
Sperm count / mL	>16 x 106/mL	If <, oligozoospermia
Total sperm number	> 39 x 106	If <, oligozoospermia
Progressive motility	> 30%	If <, asthenozoospermia
Total motility	> 42%	If <, asthenozoospermia
Normal forms	≥ 4%	If <, teratozoospermia
Vitality	> 54%	/
White blood cell count	< 1 x 106/mL	If >, pyospermia or leukospermia
Anti-sperm antibodies	< 50%	/

The reference values are general indicators of fertility. Despite having results below the reference values, 5% of men in the study group procreated successfully.

There are two further important factors to properly interpret results:

- sperm quality demonstrates significant intraindividual variation, and in the event of a pathological semen analysis, the test must be repeated before a definitive assessment can be made.
- the semen is analysed comprehensively on the basis of the most recent information on the couple, such as the partner's age, the frequency of sexual intercourse and lifestyle.