TECHNOLOGY

emen analysis: how to read the result and w at to do next

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O reference values for semen analysis: volume, concentration, motility, morphology. What oligoz oospermia and azoospermia mean, and how to prepare for the test.

A semen analysis is the most informative and at the same time the cheapest test in a couple's work -up. One test answers a question that otherwise takes years: is there a male factor, and how pronounc ed is it.

he trouble is that the result sheet looks like a table of a dozen numbers and Latin terms, and a man u sually leaves the laboratory feeling he has been handed a verdict. In reality most deviations in a semen analysis are not final — and almost none of them can be read from a single number.

When to have a semen analysis

- there has been no pregnancy after 12 months of regular intercourse without contraception (or 6 mon ths if the partner is over 35)
- before an IVF, ICSI or insemination programme
- at the pregnancy planning stage, especially after 35
- after infections, injuries or operations on the scrotum, or with a varicocele
- when planning sperm cryopreservation — for example, before treatment for cancer
- to monitor the result of treatment or surgical correction.

ow to prepare: 6 rules

Poor preparation is the most common cause of "frightening" results that are not confirmed later.

1. bstinence for 2–7 days. No less and no more. One day gives a reduced volume and concentration; two weeks gives many immotile and aged sperm.
2. No alcohol for 3–5 days before the test.
3. No sauna, steam bath or hot bath for 7–10 days. Overheating the scrotum directly suppresses sperma togenesis.
4. Do not test during an acute illness. A temperature above 38 °C spoils the results for the next 2–3 months — that is how long the sperm maturation cycle takes. After flu or Covid it makes sense t o wait.
5. ell us about your medication. Antibiotics, hormonal preparations, some blood-pressure drugs and, s parately, anabolic steroids have a substantial effect on the result.
6. Provide the sample at the clinic. The material must reach the laboratory within an hour and must not get cold. Collecting at home and travelling by transport is a typical cause of falsely poor motility.

What each value means

Below are the reference values from the 6th edition of the WHO laboratory manual (2021) — the one mod ern laboratory practice follows. It is important to understand their nature: they are not a “norm of health”, but the 5th centile of values in men whose partners conceived within a year. A value slightly below the li mit does not mean infertility, and a value within the range does not guarantee a pregnancy.

Note: if your result was issued under the older 5th WHO edition (2010), the limits there are different — v olume 1.5 ml, concentration 15 million/ml, total motility 40%, progressive 32%, vitality 58%. The figures from the two editions should not be compared directly.

Ejaculate volume — from 1.4 ml

smaller volume may point to an incomplete collection, a short abstinence, an obstruction or retrograde ejac ulation. On its own, volume is the least important value.

oncentration — from 16 million/ml, total count — from 39 million

These are the basic figures. A reduced concentration is called oligozoospermia, a complete absence of sp erm azoospermia, and an extremely small number found only after centrifugation cryptozoospermia.

otility: total — from 42%, progressive — from 30%

he most important value, together with concentration. What matters is progressive motility — sperm that move forward rather than on the spot. Reduced motility is asthenozoospermia.

orphology — from 4% normal forms

he figure "4%" shocks patients most: it seems that 96% of the sperm are defective. That is true — and it is the physiological norm for humans. Assessment by the strict Kruger criteria is deliberately harsh. A r educed share of normal forms is teratozoospermia.

Vitality — from 54%

Shows the share of live sperm. It is especially important when motility is low: it distinguishes "the sperm a re dead" from "alive but immotile" — different causes and different tactics.

H — from 7.2, leukocytes — under 1 million/ml

Unlike the previous ones, these two values are not centile limits but agreed thresholds. Raised leukocytes (l eukocytospermia) point to an inflammatory process that needs separate investigation.

Liquefaction time, aggregation, agglutination

gglutination — sperm sticking to one another — may indicate an immunological factor. In that case a MAR test for antisperm antibodies is ordered.

e semen analysis proves nothing

his is the main thing to remember. The same man's semen values fluctuate widely depending on abst inence, stress, a recent illness, the season and even the quality of sleep.

So when there are deviations, the test is repeated after 2–4 weeks, in the same laboratory and with the sa me preparation. A diagnosis is made on two or three tests, not on one sheet.

There are known cases where a "catastrophic" first analysis turned out perfectly workable after proper p reparation and a repeat — and the reverse, where a problem was missed on the strength of one good re sult.

dditional tests

When a basic semen analysis is not enough:

- MAR test — antisperm antibodies, the immunological factor in infertility
- perm DNA fragmentation test — a separate measure of the quality of the genetic material. A nor mal semen analysis with high DNA fragmentation happens, and that is sometimes what explains re current pregnancy loss or IVF failures with "good" tests
- semen biochemistry (fructose, zinc, ±glucosidase) — helps to localise the problem
- bacterial culture and PCR for infections in leukocytospermia
- hormone profile: FSH, LH, total testosterone, prolactin, oestradiol, sometimes inhibin B
- karyotyping and analysis of the Y-chromosome AZF locus — mandatory in azoospermia and severe oligozoospermia
- scrotal ultrasound with Doppler — to detect a varicocele, cysts or signs of obstruction.

What to do with a poor result

Step 1. Find the cause

The most common causes that can genuinely be corrected:

- varicocele — dilated veins of the scrotum; operated on where indicated, after which the values o ften improve
- infections and inflammatory processes — treated
- hormonal disorders — corrected with medication
- obstruction of the vas deferens — resolved surgically or bypassed by retrieving sperm directly from t esticular tissue
- lifestyle and external factors — nicotine, excess weight, overheating, anabolic steroids, some med ication, occupational hazards.

rimary testicular damage — after orchitis, chemotherapy or injury, or with genetic conditions — is often irreversible, but even then options remain.

Step 2. Give the body 3 months

Since a full cycle of spermatogenesis takes about 72–74 days, any treatment or lifestyle change is asses sed no earlier than 3 months later. A follow-up analysis before then simply will not show the effect.

What works over those three months: giving up nicotine, normalising weight, avoiding saunas and hot b aths, moderate physical activity, proper sleep, treating any infections found, and antioxidant therapy as p rescribed by a doctor.

Step 3. Choose the way to achieve a pregnancy

Even with pronounced deviations there are solutions today:

- CSI — the embryologist injects a single selected sperm cell straight into the egg. Literally a handf ul of live sperm is enough for fertilisation
- PICSI — additional selection of mature sperm
- A, PESA, TESE, MESA — retrieving sperm directly from the testis or epididymis in azoospermia. A real route to becoming a biological father even when there is not a single sperm cell in the ejaculate

- donor sperm — the option when a man's own sperm cannot be obtained.

All these methods are available in the infertility treatment programmes of the Ekstramed clinic in Ivano -Frankivsk.

Frequently asked questions

s the procedure painful? No. A semen analysis is a non-invasive test; the sample is obtained by masturb ation in a private room at the clinic.

How long does the result take? Usually 1–2 working days. Kruger morphology and additional tests may ta ke longer.

What if the analysis says "azoospermia"? Don't panic, and don't draw conclusions from one test. The a nalysis should be repeated with examination of the pellet after centrifugation, hormones checked (FSH first of all), a scrotal ultrasound and a genetic work-up done. Azoospermia can be obstructive — sperm are pro duced but cannot get out — and that is a solvable situation.

Do supplements and vitamins help? Antioxidants can improve the values moderately, but they do not r place treating the cause. A doctor should prescribe them, not an advert.

Does a normal semen analysis mean the man is fine? Not always. There are situations with normal bas ic values and high DNA fragmentation or an immunological factor. So with unexplained infertility the man 's work-up does not end with a semen analysis.

Where to have a semen analysis in Ivano-Frankivsk? At the Ekstramed clinic — the test is done in our own laboratory, and the result can be discussed straight away with an andrologist. To book: the contact s section.

This article is for information only and does not replace a consultation with a doctor. Semen analysis resu

lts should be interpreted, and treatment prescribed, by an andrologist or urologist.