

## Borderline sperm parameters explained



### What "borderline" means in semen testing

A borderline semen analysis usually means that one or more measured values are close to the lower reference limit used by the laboratory. These reference limits are often based on World Health Organization data and describe values seen in fertile populations; they are not a strict line between fertile and infertile. A result just below a reference limit may carry different meaning from a result that is severely reduced, and a result just above the limit does not guarantee pregnancy.

Commonly reviewed parameters include semen volume, sperm concentration, total sperm number, total motility, progressive motility, vitality, morphology, pH, liquefaction time, and sometimes white blood cells or round cells. Each parameter describes a different part of reproductive function. For example, concentration estimates how many sperm are present per milliliter, while progressive motility describes how many sperm move forward effectively.

The word borderline can also reflect uncertainty. Semen quality fluctuates because sperm production takes roughly several weeks, and the final sample is influenced by recent fever, abstinence interval, ejaculation completeness, alcohol or cannabis use, medications, heat exposure, stress, and laboratory

technique. This is why a single borderline result is usually interpreted cautiously. Many clinicians prefer at least two semen analyses, collected under recommended conditions, before drawing stronger conclusions.

## **Key numbers and how they fit together**

Sperm concentration is the number of sperm per milliliter of semen. Total sperm number combines concentration with semen volume, which can be clinically important: a slightly low concentration in a larger volume may produce a different total sperm output than the same concentration in a very small volume. Low volume can suggest incomplete collection, short abstinence, ejaculatory duct issues, retrograde ejaculation, androgen deficiency, or other factors, depending on the clinical context.

Motility is usually divided into total motility and progressive motility. Total motility includes sperm that move in any way, while progressive motility focuses on sperm moving forward. Progressive movement matters because sperm must travel through cervical mucus and the reproductive tract to reach the egg. Borderline motility may be more meaningful when it occurs together with low concentration or low total sperm number.

Morphology describes the percentage of sperm with a normal size and shape, often assessed using strict criteria. A low or borderline morphology percentage can be unsettling, but morphology is only one part of semen analysis. Many sperm in any sample have abnormal forms, even among fertile men. Clinicians usually interpret sperm morphology alongside concentration, motility, the couple's fertility history, and whether assisted reproductive technology is being considered.

Other values can add useful clues. Abnormal pH may suggest infection or obstruction in some situations. Delayed liquefaction or high viscosity can affect sperm movement through the sample and may complicate interpretation. Vitality testing can help distinguish immotile but living sperm from dead sperm when motility is very low. These details are best reviewed with a clinician familiar with semen testing.

## **Why one borderline result is rarely the whole story**

Semen analysis is a snapshot, not a permanent label. The sample depends on both biology and collection conditions. An abstinence interval that is too short may reduce volume and total sperm number; an interval that is too long may increase count but worsen motility in some samples. Missing the first part of the ejaculate can lower sperm count because that portion is often sperm-rich. Recent fever, influenza-like illness, sauna use, intense heat exposure, anabolic steroids, testosterone therapy, some medications, and acute stress can temporarily change results.

Because spermatogenesis and sperm maturation take time, clinicians may repeat testing after an interval rather than immediately reacting to a borderline value. A repeat sample can clarify whether the finding persists, improves, or worsens. This matters emotionally as well as medically: people often feel blamed or defective after seeing an abnormal number, when the result may be transient, collection-related, or only mildly outside the reference range.

It is also important to avoid interpreting semen parameters as a standalone pregnancy probability calculator. A couple may conceive with borderline values, especially if the other fertility factors are favorable and timing is good. Conversely, normal semen parameters do not rule out all male fertility factors, such as sperm DNA fragmentation testing concerns in selected cases, nor do they exclude female or couple-level factors. Fertility is probabilistic, not binary.

## **Common borderline patterns**

Some reports show one borderline parameter with the rest of the analysis reassuring. For example, isolated low sperm morphology can appear dramatic because the percentage of normal forms may be small. However, if sperm concentration and progressive motility are strong, the practical impact may be limited. This is one reason clinicians are cautious about making decisions from morphology alone.

Another common pattern is borderline concentration with normal motility. In that situation, total sperm number and the duration of trying to conceive become important. A slightly low concentration may matter less if semen volume is robust and progressive motility is good. If concentration is repeatedly low, a clinician may consider history, examination, hormone testing, medications, occupational exposures, and varicocele.

Borderline motility can have several explanations. Some are temporary, such as delayed sample delivery, temperature exposure during transport, illness, or prolonged abstinence. Others may relate to oxidative stress, infection or inflammation, varicocele, smoking, obesity, or underlying testicular function. Laboratories also differ in handling and reporting, so the conditions of collection and processing matter.

Low or borderline semen volume should prompt careful questions about whether the entire sample was collected, the abstinence interval, orgasm and ejaculation function, medications, prior pelvic surgery, and symptoms suggesting retrograde ejaculation. A clinician may also look at pH and sperm concentration to decide whether a low volume result is likely technical, functional, or anatomical.

### **What clinicians may consider next**

When semen parameters are borderline, the next step is usually not a single automatic treatment. A healthcare professional may first confirm whether the sample was collected correctly, whether the abstinence period matched laboratory instructions, and whether there were recent illnesses, medications, or exposures that could affect the result. Repeat semen analysis is commonly used to confirm persistence because natural variability is expected.

If borderline findings persist, evaluation may include a medical and reproductive history, physical examination, and sometimes hormone tests such as follicle-stimulating hormone, luteinizing hormone, testosterone, prolactin, or thyroid testing when clinically indicated. The clinician may assess for varicocele, testicular size, prior infections, undescended testis history, chemotherapy or radiation exposure, anabolic steroid or testosterone use, and ejaculatory dysfunction and conception issues.

The most useful approach is often couple-based fertility evaluation. The same semen result may be managed differently depending on the partner's age, ovarian reserve, ovulation pattern, uterine and tubal factors, miscarriage history, and duration of trying. For example, expectant management may be reasonable in some mildly borderline situations, while earlier referral may be appropriate when pregnancy has been delayed for a long time or when the female partner is older.

Specialists may discuss options ranging from timed intercourse and lifestyle optimization to intrauterine insemination or in vitro fertilization with intracytoplasmic sperm injection, depending on the full clinical picture. These are individualized decisions. Borderline numbers alone should not be used to prescribe supplements, procedures, or assisted reproduction without professional interpretation.

## **Lifestyle factors and reversible influences**

Some contributors to borderline semen parameters are modifiable, although improvement is not guaranteed and should not be framed as personal failure. Smoking, heavy alcohol use, cannabis use, anabolic steroids, testosterone therapy, obesity, untreated sleep apnea, high heat exposure to the testes, and certain occupational chemicals may affect sperm production or function. Medication review is also important because some drugs can influence ejaculation, hormones, or sperm quality.

General health measures may support spermatogenesis: balanced nutrition, regular physical activity, adequate sleep, management of chronic conditions, and avoidance of excessive heat around the testes. Specific nutrient deficiencies can matter, but taking high-dose supplements without evidence of deficiency or medical advice is not always helpful and can sometimes be harmful. Discussions about antioxidant supplements for male subfertility should be individualized.

Timing matters when reassessing. Because sperm production takes weeks, changes made today may not be reflected immediately in a semen analysis. Clinicians often consider a repeat interval long enough to capture a new sperm production cycle, especially after stopping heat exposure, recovering from fever, or addressing a reversible medication or lifestyle factor. Any change involving prescribed medication, testosterone, or fertility treatment should be made with medical supervision.

## **How to read the report without spiraling**

A semen report can feel personal, but it is a laboratory measurement, not a verdict on masculinity, partnership, or future parenthood. Start by checking

the basics: abstinence interval, whether the full sample was collected, time from collection to analysis, and whether the laboratory used standard methods. Then look at the pattern rather than the single most alarming number.

Useful questions for a clinician include: Which parameter is borderline, and by how much? Does the total motile sperm count look reassuring or reduced? Should the test be repeated, and under what collection instructions? Are there symptoms or history suggesting infection, varicocele, hormonal imbalance, or ejaculation problems? Does the couple's timeline warrant referral to a reproductive urologist or fertility specialist?

It can help to bring the full report, not just a screenshot of the abnormal flag. Reference ranges, comments, viscosity, liquefaction, pH, volume, concentration, motility categories, and morphology method all matter. If trying to conceive has been emotionally difficult, it is reasonable to ask for a clear follow-up plan rather than being left with ambiguous borderline language.

Most importantly, borderline sperm parameters are best understood as a signal for context and follow-up. They may point toward a reversible factor, a need for repeat testing, or a broader fertility evaluation. They do not, by themselves, define the chances of pregnancy or the only path forward.