

Combined Sperm Abnormalities

Oligo-Asthenzo-Teratozoospermia (OAT): Understanding Low Sperm Count, Poor Motility and Abnormal Morphology Together

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When a man receives a semen-analysis report, he may expect to see only one number telling him whether his fertility is normal.

In reality, semen analysis evaluates several different aspects of sperm health.

A patient may come to me and say:

“Doctor, my sperm count is low.”

But when I examine the complete report, I may find that the sperm count is low, the sperm are also moving poorly, and only a small proportion have normal morphology.

Another patient may have a fairly acceptable sperm concentration but severely reduced motility and abnormal morphology.

These are examples of **combined sperm abnormalities**.

The most widely recognized combined pattern is called:

Oligo-Asthenzo-Teratozoospermia, usually abbreviated as **OAT**.

The term describes the simultaneous presence of:

Oligozoospermia — reduced sperm concentration,

Asthenozoospermia — reduced sperm motility, and

Teratozoospermia — reduced proportion of normally shaped sperm.

The European Association of Urology specifically recognizes that these three abnormalities frequently occur together and describes this pattern as **oligo-asthenzo-terato-zoospermia syndrome**. Importantly, major fertility guidelines also emphasize that semen abnormalities become more clinically significant when **multiple parameters are abnormal simultaneously**.

My first message to patients with an OAT report is:

Do not judge your fertility from one word or one laboratory number. We need to understand how severe each abnormality is, confirm that it is persistent, find the underlying cause, and evaluate fertility as a couple.



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Combined sperm abnormalities can reduce the probability of natural conception considerably, particularly when the abnormalities are severe.

But OAT does **not automatically mean permanent sterility**.

Some causes are correctable.

Some men improve significantly with appropriate treatment.

Others can successfully achieve biological fatherhood through assisted reproductive techniques such as IVF with ICSI.

The correct approach begins with diagnosis rather than fear.

What Are Combined Sperm Abnormalities?

A semen analysis examines several different properties of sperm.

The three parameters most commonly discussed are:

1. **Sperm concentration** — how many sperm are present.
2. **Sperm motility** — how effectively sperm move.
3. **Sperm morphology** — what proportion have a normal shape under strict laboratory criteria.

When one parameter is abnormal, the fertility effect may be relatively limited or significant depending upon severity and other reproductive factors.

When two or three parameters are significantly abnormal simultaneously, the probability of impaired male fertility generally becomes greater.

AUA/ASRM guidance specifically states that while no single sperm parameter such as concentration, motility or morphology is usually diagnostic of infertility by itself, **the odds of infertility increase as the number of abnormal semen parameters increases**.

This is the central concept behind combined sperm abnormalities.

Different Types of Combined Sperm Abnormalities

Not every combined abnormality involves all three parameters.

A man may have:

Oligo-asthenozoospermia — low sperm concentration plus poor motility.



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Oligo-teratozoospermia — low sperm concentration plus abnormal morphology.

Astheno-teratozoospermia — poor sperm motility plus abnormal morphology despite a relatively acceptable concentration.

When all three occur together, the condition is described as:

Oligo-Astheno-Teratozoospermia — OAT

OAT is one of the most clinically important semen patterns encountered in male infertility.

However, it is still a **description of the semen analysis**, not the underlying disease.

The real medical question is:

Why are sperm number, movement and morphology abnormal together?

Current WHO Semen Reference Values

The sixth edition of the **WHO Laboratory Manual for the Examination and Processing of Human Semen** remains the international laboratory standard for semen analysis.

WHO emphasizes standardized collection and laboratory techniques because poor laboratory methodology can produce misleading results.

Current reference data incorporated into EAU guidance give approximate lower fifth-centile values of:

- Semen volume: **1.4 mL**
- Total sperm number: **39 million per ejaculate**
- Sperm concentration: **16 million/mL**
- Total motility: **42%**
- Progressive motility: **30%**
- Vitality: **54% live sperm**
- Normal morphology: **4%**

These values need careful interpretation.

They are **not absolute borders separating fertile from infertile men**.

They represent the lower fifth percentile among men whose partners achieved natural pregnancy within twelve months.

The EAU explicitly warns that the lower reference limits do not represent a dividing line between fertility and infertility. Reproductive potential needs a multiparametric interpretation involving both partners.

That is why I never tell a patient:

“Your motility is 29%, therefore you are infertile.”

The clinical picture is more complex.

A Note About Asthenozoospermia Terminology

Patients may notice different numbers on different websites.

This occurs because classification terminology has evolved.

The current WHO reference dataset gives approximately **30% progressive motility** as the lower fifth-centile reference.

However, EAU's conventional clinical subdivision still lists asthenozoospermia using the older threshold of less than **32% progressive motility**, while acknowledging that the sixth WHO edition does not formally define these subdivisions in the same manner.

Therefore, the exact percentage should not be treated as a magical biological cutoff.

The whole semen analysis matters.

What Does Sperm Concentration Tell Us?

Sperm concentration represents the number of sperm in each millilitre of semen.

A reduced concentration is called **oligozoospermia**.

When the concentration becomes very low—particularly below approximately **5 million/mL**—the probability of important underlying testicular, genetic or obstructive disease becomes higher.

But concentration alone does not tell us how many useful sperm are available.

A man may have 20 million sperm/mL but extremely poor progressive motility.

Another may have only 8 million/mL but relatively good movement.

Their fertility situations are not identical.

Total Sperm Number Is Also Important



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Sperm concentration is influenced by the amount of seminal fluid.

For this reason, WHO emphasizes that **total sperm number in the entire ejaculate** can sometimes provide a better reflection of sperm output than concentration alone.

For example:

A man with 10 million sperm/mL in 4 mL of semen has approximately 40 million total sperm.

A man with 10 million sperm/mL in 0.8 mL has approximately 8 million total sperm.

Their concentration is identical, but their total sperm output is very different.

What Is Sperm Motility?

Motility refers to the ability of sperm to move.

This is essential because sperm normally need to travel through the female reproductive tract to reach an egg.

Sperm movement is usually described as:

progressive motility, where sperm move forward effectively;

non-progressive motility, where sperm move but make little forward progress;

and **immotility**, where sperm do not move.

When effective motility is reduced, fertilization becomes more difficult because fewer sperm are capable of reaching the egg naturally.

Poor Motility Does Not Always Mean Dead Sperm

This distinction is important.

A sperm may be alive but unable to move effectively.

When motility is severely reduced, laboratory **vitality testing** may help determine whether immotile sperm remain alive.

This can become particularly relevant in very severe motility disorders and during assisted reproduction.

What Is Sperm Morphology?

Morphology refers to the microscopic shape of sperm.



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A sperm cell has several structures including:

the head, midpiece and tail.

Abnormalities may involve any of these areas.

Modern morphology assessment uses strict criteria, which explains why the reference value for normal forms is relatively low—approximately **4%**.

This number often frightens patients unnecessarily.

A report saying:

4% normal morphology

does **not** mean that 96% of sperm are genetically abnormal.

Morphology is a microscopic classification based on shape.

It should not be interpreted as a direct genetic diagnosis.

Teratozoospermia Does Not Automatically Mean Genetic Disease

Abnormal-looking sperm may occur with:

- oxidative stress,
- varicocele,
- testicular dysfunction,
- toxic exposure,
- idiopathic infertility,
- other reproductive disturbances.

However, morphology alone has limited ability to predict whether natural conception will or will not occur.

This is why I interpret morphology together with concentration, motility and the couple's reproductive history.

Why Combined Abnormalities Matter More

Imagine three men.

The first has slightly low sperm concentration but good motility and morphology.

The second has poor motility but excellent sperm number.



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The third has low count, poor movement and abnormal morphology simultaneously.

The third patient generally has a greater male-factor infertility burden.

This is consistent with AUA/ASRM guidance, which states that semen-analysis findings carry greater clinical significance when multiple abnormalities are present.

This is why OAT deserves a complete male-infertility assessment.

Is OAT a Disease?

No.

OAT is better understood as a **semen-analysis pattern or syndrome**.

It tells us what the sperm currently look like in the laboratory.

It does not tell us why.

Possible causes range from relatively correctable problems to significant testicular or genetic disorders.

Therefore, writing “OAT” on a prescription is not a complete diagnosis.

The next step is finding the cause.

What Causes Combined Sperm Abnormalities?

OAT is often multifactorial.

The same underlying process can reduce sperm production, disturb maturation and increase the proportion of poorly motile or abnormally shaped sperm.

Important causes include:

varicocele, testicular dysfunction, genetic abnormalities, hormonal disorders, undescended testes, testicular trauma, infection, medications, anabolic steroids, cancer treatment, metabolic disease, smoking, heavy alcohol exposure, environmental toxins and unexplained male infertility.

Varicocele

Varicocele is one of the most important potentially correctable findings in male infertility.

It occurs when veins around the testicle become abnormally enlarged.



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This may alter the testicular environment through mechanisms involving:

higher scrotal temperature, oxidative stress, hypoxia and impaired testicular function.

Varicocele can therefore affect multiple semen parameters simultaneously.

A man may show:

low concentration, poor progressive motility and abnormal morphology.

Current EAU evidence shows that varicocele repair in appropriately selected infertile men can improve semen parameters, including sperm concentration, progressive motility and morphology.

Does Every Varicocele Require Surgery?

No.

Treatment is generally considered when there is:

a **clinically palpable varicocele**, infertility and abnormal semen parameters.

AUA/ASRM guidance advises against routine varicocele surgery for a non-palpable varicocele found only on imaging.

This distinction is important because many small ultrasound findings may be incidental.

Oxidative Stress

Sperm cells are particularly vulnerable to oxidative damage.

Reactive oxygen species are produced naturally in the body, but excessive oxidative stress can damage:

sperm membranes, motility and DNA.

Oxidative stress has been investigated extensively in OAT.

Potential contributors include:

smoking, varicocele, inflammation, obesity, metabolic disease and environmental exposure.

Recent clinical trials continue to investigate antioxidant and nutritional approaches in OAT, and some have reported improvements in semen parameters.

However, an improvement in laboratory parameters does not automatically prove an increase in live-birth rates.



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What Do Current Guidelines Say About Antioxidants?

This is particularly important because antioxidant products are heavily marketed for male infertility.

The new **2025 WHO infertility guideline** did **not make a recommendation either for or against antioxidant supplements** for men with one or more semen parameters outside WHO reference ranges because the available evidence does not clearly establish which men benefit or whether clinically meaningful reproductive outcomes improve.

AUA/ASRM similarly advises that the clinical utility of supplements such as antioxidants and vitamins is uncertain and that evidence is inadequate to recommend specific agents routinely.

Therefore, I do not consider an antioxidant capsule a substitute for evaluation of OAT.

Hormonal Disorders

Normal sperm production depends upon communication between the hypothalamus, pituitary gland and testes.

Important hormones include:

FSH, LH and testosterone.

Abnormalities can impair sperm production and produce combined semen abnormalities.

AUA/ASRM recommends hormonal evaluation including FSH and testosterone in infertile men with oligozoospermia, azoospermia, atrophic testes or evidence of hormonal disease.

FSH and Testicular Function

FSH stimulates the sperm-producing environment inside the testes.

A high FSH level together with:

very low sperm concentration and small testes

can indicate significant primary impairment of spermatogenesis.

But normal FSH does not guarantee normal sperm production.

Hormones must be interpreted with examination and semen findings.



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Low Testosterone

Low testosterone may coexist with male infertility.

However, the solution is **not automatically testosterone replacement**.

This is one of the most important fertility warnings.

Testosterone Can Reduce Sperm Production

External testosterone injections, gels and anabolic hormones suppress pituitary FSH and LH.

That suppression can cause sperm production to fall dramatically or stop completely.

AUA/ASRM guidance specifically states that **testosterone monotherapy should not be prescribed to a man interested in current or future fertility**.

A man with infertility and low testosterone requires a fertility-preserving endocrine assessment.

Anabolic Steroids and Gym Hormones

Anabolic steroid use can cause:

severe oligozoospermia or azoospermia.

Many patients do not initially mention bodybuilding injections because they do not regard them as medications.

I ask specifically about:

testosterone injections, anabolic steroids and hormonal gym products.

Stopping the suppressive agent is often the first step toward recovery.

Genetic Causes

Genetic disorders become especially important when OAT includes **severe oligozoospermia**.

Current AUA/ASRM guidance recommends **karyotype testing** in primary infertility with azoospermia or sperm concentration below 5 million/mL when accompanied by elevated FSH, testicular atrophy or evidence of impaired sperm production.



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The 2024 guideline amendment also refined Y-chromosome testing.

Y-chromosome microdeletion analysis is recommended particularly for men with azoospermia or sperm concentration ≤ 1 million/mL when the clinical picture suggests impaired sperm production.

These tests should be selected according to the clinical phenotype rather than performed automatically in every mild case of OAT.

Klinefelter Syndrome

Klinefelter syndrome usually involves an extra X chromosome, most commonly:

47,XXY.

It may be associated with:

small testes, high FSH, low testosterone and severe impairment of sperm production.

Some affected men are diagnosed only after presenting for infertility.

Y-Chromosome Microdeletions

Important regions of the Y chromosome contain genes involved in spermatogenesis.

Microdeletions can result in:

severe oligozoospermia or azoospermia.

This is especially relevant when assisted reproduction is being considered because certain Y-chromosome abnormalities can be transmitted to male offspring.

Genetic counselling may therefore be appropriate.

Undescended Testes

A history of one or both testes failing to descend normally during childhood can affect adult sperm production.

Even after corrective surgery, some men remain at increased risk of abnormal semen parameters.

Bilateral cryptorchidism generally carries a greater reproductive risk.

Testicular Trauma and Torsion

Severe testicular injury or previous torsion can damage sperm-producing tissue.

A patient may have forgotten an adolescent event that later proves important during infertility evaluation.

A detailed history matters.

Infection and Inflammation

Certain genital infections can affect fertility by damaging:

testicular tissue, epididymis or sperm transport pathways.

However, an abnormal semen report does not prove infection.

Men should not be given repeated antibiotics simply because their motility is poor.

AUA/ASRM advises investigation for infection when semen findings such as pyospermia indicate a possible inflammatory process.

Cancer Treatment

Chemotherapy and radiation therapy can damage sperm-producing cells.

Men who may receive gonadotoxic cancer treatment should ideally receive fertility counselling and sperm-banking advice beforehand when circumstances allow.

Previous cancer therapy should always be included in the infertility history.

Obesity and Metabolic Health

Obesity may affect male reproduction through:

hormonal changes, reduced testosterone, increased estrogen conversion, metabolic inflammation and increased scrotal temperature.

Diabetes and metabolic syndrome can additionally influence sexual function and reproductive health.

A man with OAT should therefore be assessed as a whole patient rather than only as a semen report.

Smoking

Smoking has been associated with poorer sperm concentration, motility and morphology in many observational studies.

Stopping smoking cannot guarantee that OAT will disappear, but it removes an avoidable reproductive-health risk.

The new WHO infertility guideline specifically emphasizes prevention and management of modifiable infertility risk factors such as tobacco exposure.

Alcohol

Heavy or chronic excessive alcohol use may adversely affect hormones and semen quality.

Men undergoing fertility treatment should avoid heavy alcohol intake.

Again, this is supportive management—not a guarantee that semen parameters will normalize.

Heat Exposure

The testes normally function at a temperature below core body temperature.

Repeated substantial heat exposure may impair spermatogenesis in susceptible men.

Relevant exposure may occur in some occupations or repetitive high-temperature environments.

Normal everyday activities should not become a source of excessive anxiety.

Environmental and Occupational Factors

Potential reproductive toxins include:

some pesticides, heavy metals, industrial chemicals and radiation.

Evidence varies according to individual exposure.

Occupational history can be valuable when there is otherwise unexplained OAT.

Idiopathic OAT

In many men, no single cause is identified despite appropriate assessment.

This is commonly described as **idiopathic male infertility**.



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Current EAU guidance estimates that a substantial proportion of men with abnormal sperm parameters have no clearly identifiable conventional cause. Proposed mechanisms include oxidative stress, environmental endocrine disruption and genetic or epigenetic abnormalities not detected in routine testing.

Idiopathic does not mean imaginary.

It means current testing has not identified the underlying mechanism.

One Abnormal Semen Analysis Should Not Be the Final Diagnosis

Sperm production changes over time.

Results may be influenced by:

recent fever, illness, abstinence interval, incomplete sample collection and laboratory variation.

AUA/ASRM emphasizes that semen parameters can vary substantially between ejaculates and supports obtaining repeat analyses when the first result is abnormal.

The newer **2025 WHO infertility guideline** provides an especially practical recommendation:

for men with one or more semen parameters outside WHO reference ranges, WHO suggests **repeating the semen analysis after a minimum of 11 weeks**.

This interval approximately reflects the biology of sperm production and reduces the chance of making major decisions from a temporary abnormality.

Why a Recent Fever Matters

Sperm production is sensitive to systemic fever.

A significant febrile illness may temporarily reduce:

count, motility and morphology.

Because sperm development takes weeks, the semen report may remain abnormal even after the fever has resolved.

If an unexpected OAT result follows recent illness, timing of repeat testing matters.

Correct Sample Collection Matters

A semen test can also become misleading if the entire ejaculate is not collected.

WHO notes that the early fraction of semen is particularly sperm-rich, so losing this portion can significantly affect the measured result.

Patients should therefore inform the laboratory if part of the sample was lost.

How I Assess a Patient With Combined Sperm Abnormalities

When a patient comes to me with OAT, I do not immediately choose a medicine.

I want to answer several questions.

Is this abnormality genuine and persistent?

How severe is each component?

Is there a correctable cause?

Is there an important hormonal or genetic disorder?

What is the fertility status of the female partner?

Only after answering these questions can treatment be planned properly.

Detailed Reproductive History

I ask:

How long has the couple been trying?

Has the man ever contributed to a pregnancy?

Has his partner ever conceived?

Was there a previous miscarriage?

Was fertility treatment used previously?

This distinguishes primary from secondary infertility and provides important prognostic information.

Sexual History

Sexual function is directly relevant to fertility.

I ask about:

libido, erection, ejaculation, intercourse frequency and timing.

A man may have abnormal sperm parameters and erectile dysfunction simultaneously.

Treating only the sperm report would leave an important fertility barrier unaddressed.

Childhood History

I ask about:

undescended testes, orchidopexy, hernia surgery, testicular torsion and significant childhood genital disease.

A childhood problem may explain today's sperm abnormalities.

Medication History

The complete list should include:

prescription medicines, testosterone, anabolic steroids, supplements and herbal medicines.

Patients should never assume that a “natural” product is irrelevant to fertility assessment.

Physical Examination

Current male-infertility guidance supports examination of:

the testes, epididymides, vas deferens and spermatic cords, as well as assessment for varicocele and signs of endocrine abnormality.

Testicular size is especially important.

Small testes combined with severe OAT and high FSH suggest a different problem from normal testes with a large clinical varicocele.

Hormonal Evaluation

Depending upon the semen result and examination, laboratory assessment commonly includes:

FSH and total testosterone, with LH and prolactin selected according to the hormonal pattern and symptoms.

AUA/ASRM specifically supports hormonal assessment when oligozoospermia is present.



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Genetic Evaluation

Genetic testing is especially relevant when the sperm concentration is extremely low or when examination and FSH suggest impaired spermatogenesis.

The **2024 AUA/ASRM update** currently recommends karyotyping below 5 million/mL in the appropriate primary-infertility phenotype and Y-chromosome microdeletion testing particularly at ≤ 1 million/mL with evidence of impaired sperm production.

This is an important modern refinement compared with older blanket testing thresholds.

Ultrasound

Scrotal Doppler ultrasound may be useful when:

the testicular examination is uncertain, a testicular lesion is suspected, or varicocele assessment requires clarification.

However, routine ultrasound is not necessary simply because every patient has an abnormal semen report.

AUA/ASRM does not recommend routine scrotal ultrasound as the initial investigation for every infertile man.

Sperm DNA Fragmentation

Sperm DNA fragmentation measures damage within sperm DNA.

It has become popular in fertility clinics, but it is not a replacement for standard semen analysis and is not automatically required in every patient with OAT.

AUA/ASRM does **not recommend sperm DNA fragmentation testing as part of the routine initial male-infertility evaluation.**

It becomes more useful in selected situations such as:

recurrent pregnancy loss, unexplained infertility or repeated ART failure.

Can OAT Cause Infertility?

Yes, combined abnormalities can substantially reduce natural fertility.

But the degree varies.



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A mild OAT pattern is very different from:

a sperm concentration of 2 million/mL, progressive motility of 5%, and virtually no normally shaped sperm.

The female partner's reproductive status also changes the probability of pregnancy.

This is why semen parameters should never be interpreted without the couple.

The Female Partner Must Be Evaluated Simultaneously

AUA/ASRM recommends concurrent evaluation of both partners in infertility.

This is particularly important in OAT because treatment can take months.

Consider a 28-year-old woman with normal ovarian reserve and patent tubes.

Her partner has a correctable varicocele and moderate OAT.

Treating the male factor and reassessing may be reasonable.

Now consider the same semen report when the female partner is 40 with low ovarian reserve.

Waiting many months may not be the best fertility strategy.

The treatment plan belongs to the **couple**, not to the semen report alone.

Can Combined Sperm Abnormalities Improve?

Yes, depending upon the cause.

Potentially reversible or improvable conditions include:

clinically significant varicocele, hormonal deficiency, anabolic-steroid suppression, certain infections, selected obstructions and modifiable lifestyle or metabolic factors.

However, some genetic and severe primary testicular disorders may not normalize with medication.

A responsible fertility physician should therefore avoid guaranteeing that every OAT report will become normal.

Treatment of Varicocele

For an infertile man with:



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a palpable varicocele and abnormal semen parameters,
varicocele repair may be considered.

AUA/ASRM recommends considering surgical varicocelectomy in men attempting conception who have a palpable varicocele, infertility and abnormal semen parameters.

Improvement in sperm parameters takes time because new sperm must be produced.

Hormonal Treatment

Hormonal treatment should only be used when the hormonal situation justifies it.

For example, men with **hypogonadotropic hypogonadism** can respond substantially to gonadotropin therapy.

AUA/ASRM notes that sperm production and pregnancies can be achieved in many affected men using hCG followed by FSH where appropriate.

This is very different from giving hormones indiscriminately to men with normal endocrine function.

Clomiphene, hCG and Aromatase Inhibitors

Medicines such as:

clomiphene, hCG, letrozole or anastrozole

may be considered in selected infertile men according to testosterone, LH, FSH and other clinical findings.

They are not universal treatments for OAT.

AUA/ASRM specifically notes that SERM benefits in idiopathic infertility are limited compared with the efficiencies offered by assisted reproduction.

Never Use Testosterone as a Sperm Booster

I emphasize this repeatedly because it can prevent avoidable infertility.

External testosterone can suppress spermatogenesis and may produce azoospermia.

AUA/ASRM therefore states that testosterone monotherapy should not be prescribed to a man who wants current or future fertility.



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Treating Infection

When a genuine genital infection is identified, appropriate treatment may protect reproductive health and relieve associated inflammation.

But antibiotics should not be prescribed solely because morphology or motility is abnormal.

The infection should be demonstrated or clinically justified.

Lifestyle and General Health

Lifestyle improvement is an important part of male fertility treatment, particularly when risk factors are present.

I advise patients to address:

smoking, obesity, physical inactivity, heavy alcohol use, anabolic steroid exposure, poor diabetes control and significant occupational exposures.

The **2025 WHO infertility guideline** recommends healthy diet, physical activity and tobacco cessation for people planning or attempting pregnancy.

These measures improve overall reproductive health but should not be advertised as guaranteed cures for severe OAT.

Food and Male Fertility

There is no single food that cures OAT.

A balanced nutritional pattern can support overall health and provide adequate: protein, vitamins, minerals, healthy fats and antioxidants.

But a patient with severe OAT should not spend six months eating one particular seed, nut or herbal food while a genetic, hormonal or varicocele-related cause remains undiagnosed.

Antioxidants: A Balanced View

Oxidative stress is biologically relevant in male infertility.

Recent randomized trials have reported improvements in some semen parameters with antioxidant combinations.



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But improvement in sperm count or motility is not identical to proving improved live-birth rates.

This is why the **2025 WHO guideline made no recommendation for or against routine antioxidant supplements** in male-factor infertility.

I therefore consider antioxidant support a possible adjunct in selected men—not the foundation of treatment for every patient.

Natural Pregnancy With OAT

Natural conception remains possible in some couples with mild or moderate OAT.

Probability depends upon:

severity of each abnormal parameter, total motile sperm number, female partner's age, ovarian reserve, tubal function and duration of infertility.

Patients should therefore avoid both extremes:

“Pregnancy is impossible.”

and

“Everything is fine because some sperm are present.”

Neither statement is scientifically adequate without knowing the whole fertility picture.

What Is Total Motile Sperm Count?

Total motile sperm count combines information about:

semen volume, sperm concentration and motility.

It can sometimes give a more practical estimate of how many motile sperm are available for natural conception or fertility treatment.

This becomes particularly relevant when considering IUI.

IUI and Combined Sperm Abnormalities

Intrauterine insemination, or **IUI**, involves processing semen in the laboratory and placing selected motile sperm into the uterus around ovulation.

IUI may be useful in selected milder male-factor cases.



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However, when the total number of usable motile sperm remains very low after laboratory processing, success falls.

AUA/ASRM guidance notes that men with fewer than approximately **5 million motile sperm after processing** have limited chances of contributing to pregnancy through IUI, and IVF/ICSI may be considered.

This is not an absolute biological cutoff, but it is clinically useful for counselling.

IVF

In vitro fertilization involves bringing sperm and eggs together in the laboratory.

Conventional IVF still depends substantially upon sperm being able to reach and fertilize an egg.

When sperm number, movement and morphology are all severely impaired, fertilization may remain difficult.

ICSI

Intracytoplasmic Sperm Injection — ICSI is particularly important in severe combined sperm abnormalities.

During ICSI, an embryologist selects a viable sperm and injects it directly into a mature egg.

AUA/ASRM notes that ICSI can largely overcome the adverse effects of poor sperm concentration, motility and morphology when sufficient viable sperm are available for injection.

ASRM's 2026 committee opinion continues to recognize ICSI as a technique originally developed and typically effective for clear male-factor semen abnormalities.

This has transformed the outlook for many men with severe OAT.

ICSI Does Not Guarantee Pregnancy

ICSI assists fertilization.

It cannot guarantee:

normal embryo development, implantation, pregnancy or live birth.

Female age and egg quality remain particularly important.



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The male factor is only one part of reproductive success.

Severe OAT and Genetic Counselling

When severe oligozoospermia accompanies poor motility and morphology, genetic investigation may identify an important cause.

If a Y-chromosome microdeletion or chromosomal abnormality is identified, counselling before assisted reproduction becomes particularly important.

Some genetic causes can potentially be transmitted to offspring.

The goal of genetic counselling is to help the couple make informed decisions—not to frighten them.

Does Abnormal Morphology Mean the Baby Will Be Abnormal?

Not automatically.

This is a common and understandable fear.

Morphology describes microscopic sperm shape.

It does not directly tell us that the sperm carries a chromosomal abnormality.

Certain severe or specific morphological syndromes may have genetic significance, but ordinary teratozoospermia is not equivalent to a diagnosis of abnormal offspring.

If clinical findings suggest a genetic disorder, appropriate testing should be used rather than guessing from morphology alone.

Does OAT Cause Miscarriage?

Most miscarriages are not caused simply by an OAT label.

However, sperm DNA damage and some genetic abnormalities can contribute to reproductive failure in selected couples.

This becomes especially relevant in recurrent pregnancy loss.

AUA/ASRM recommends considering male evaluation—including karyotype and sperm DNA fragmentation—in couples experiencing recurrent pregnancy loss.

Combined Sperm Abnormalities and Sexual Function



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OAT itself does not automatically cause:

erectile dysfunction, premature ejaculation or reduced sexual desire.

A man may have completely normal sexual performance despite severely abnormal semen.

However, certain underlying disorders can affect both fertility and sexual function.

For example:

low testosterone can reduce libido and sperm production.

Diabetes can affect erections and reproductive function.

Infertility-related anxiety can produce performance problems.

This is why my assessment includes sexual health as well as semen analysis.

The Psychological Impact of OAT

Men sometimes respond to an abnormal semen report as though it were a judgment about masculinity.

They may say:

“I am not a complete man.”

This is medically and psychologically inaccurate.

A sperm report measures reproductive parameters.

It does not measure:

masculinity, sexual ability, personality or worth.

A man can have severe OAT and excellent erections.

Another can have perfect sperm parameters and severe erectile dysfunction.

Fertility and masculinity should never be confused.

The Unani Perspective on Combined Sperm Abnormalities

As a physician trained in Unani medicine and working in sexual disorders and infertility, I consider male fertility within the broader health of the reproductive system and the individual patient.



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Classical Unani literature discusses reduced sperm quantity and abnormalities of reproductive function under concepts such as **Qillat-e-Huwaniya**, together with attention to semen quality, reproductive capacity and the overall constitutional state.

Traditional Unani assessment places importance on:

Mizaj or constitutional temperament, nutrition, digestion, sleep, physical activity, psychological state, general strength and reproductive function.

This whole-person perspective can be particularly useful in a condition like OAT because sperm production may be influenced by metabolic, lifestyle, hormonal, inflammatory and general-health factors.

However, traditional terminology cannot replace contemporary semen analysis.

Unani Medicine and Modern Semen Parameters

Modern laboratory science allows us to measure sperm:

concentration, progressive motility, vitality and morphology.

These objective measurements are extremely useful for evaluating response to treatment.

Therefore, when I use an integrative Unani approach, improvement should not simply be assumed because the patient “feels stronger.”

It should be reassessed objectively through high-quality semen analysis.

What Does Unani Research Show?

Published Unani clinical literature has investigated treatment of oligospermia and male infertility.

A retrospective analysis published through CCRUM and investigators from A.K. Tibbiya College, Aligarh Muslim University reviewed four earlier studies involving **126 patients with idiopathic oligospermia** treated with different Unani formulations. The authors reported improvements in several semen parameters, including sperm count in some groups and sperm motility in another.

A separate National Institute of Unani Medicine publication also reported clinical evaluation of a Unani formulation in oligospermia and concluded that larger long-term trials were needed.

These studies are useful because they demonstrate genuine clinical investigation within Unani medicine.



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However, they have limitations.

Why We Must Not Overstate the Unani Evidence

Many earlier Unani studies:

used older definitions of low sperm count, included relatively small patient groups, did not always use modern randomized methods, and primarily measured semen parameters rather than pregnancy and live-birth outcomes.

The study involving 126 men was specifically focused on **idiopathic oligospermia**, not modern, rigorously defined severe OAT involving all three semen abnormalities.

Therefore, it would be scientifically incorrect to claim:

“One Unani medicine cures all OAT.”

The evidence does not justify that statement.

How Unani Medicine May Be Useful

The most responsible role for Unani medicine is within a **diagnosis-based integrative fertility plan**.

In selected men, individualized Unani management may aim to support:

general reproductive health, nutrition, metabolic wellbeing, lifestyle correction, associated sexual-health concerns and potentially selected semen parameters.

Its role may be particularly reasonable in some men with idiopathic infertility after important genetic, hormonal, anatomical and medical causes have been evaluated.

But the treatment needs to match the patient.

Five OAT Patients May Need Five Different Treatments

Consider five patients whose semen reports all say OAT.

The first has a large clinical varicocele.

The second has an FSH of 25 and very small testes.

The third is taking anabolic testosterone.

The fourth has low FSH, low LH and low testosterone because of pituitary disease.

The fifth has normal hormones, normal examination and no identifiable cause.



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Their semen labels may be similar.

Their diseases are not.

Therefore, giving all five men exactly the same medicine would not be rational.

This is why I believe the strongest approach is:

Unani understanding + modern diagnosis + objective follow-up + appropriate reproductive technology when necessary.

Special Treatment Planning by Dr. Nizamuddin Qasmi

At **Saira Health Care**, my focused work in **Sexual Disorders & Infertility** means that a patient with combined sperm abnormalities is evaluated beyond one semen report.

My clinical approach may include:

reproductive history, sexual history, high-quality repeat semen analysis, assessment of sperm count, total sperm number, motility and morphology, hormonal assessment, testicular examination, varicocele assessment, review of childhood testicular disease, medicine and anabolic-steroid history, metabolic and lifestyle factors, genetic testing where indicated and evaluation of the female partner's reproductive status.

Where appropriate, individualized Unani supportive management can then be integrated with modern male-fertility care.

This is what I mean by **specialized treatment**.

It does not mean one secret medicine for every patient.

It means identifying why each patient's sperm parameters are abnormal and treating that particular clinical situation.

Saira Health Care's Contribution to Sexual Disorders and Infertility

At **Saira Health Care**, male infertility is considered in the wider context of reproductive and sexual health.

Some OAT patients simultaneously experience:

erectile dysfunction, premature ejaculation, low libido, painful ejaculation, varicocele, hormonal symptoms, obesity, diabetes or fertility-related anxiety.

These problems may influence the couple's ability to conceive and deserve attention.

Our objective is not only to say:



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“Your sperm count increased.”

The more meaningful questions are:

Has total reproductive potential improved?

Is natural conception realistically possible?

Should we continue treatment?

Should varicocele be addressed?

Is genetic counselling necessary?

Should IUI be considered?

Would IVF/ICSI provide a better chance?

This is couple-centred fertility care.

The 2025 WHO Approach to Male-Factor Infertility

The **first WHO global guideline for the prevention, diagnosis and treatment of infertility**, published in November 2025, emphasizes evidence-based and person-centred care rather than pushing patients toward unproven therapies.

For men with abnormal semen parameters, an important new recommendation is repeating the semen analysis after a **minimum of 11 weeks** before final interpretation, unless clinical circumstances require a different approach.

WHO also emphasizes progressively selecting fertility treatment—from fertility education and management of identifiable conditions toward IUI or IVF where appropriate—according to clinical findings and patient preferences.

This is very relevant to OAT because treatment should not continue indefinitely when the couple's probability of natural conception remains extremely low.

How Long Does Treatment Need?

Sperm production is slow.

A newly developing sperm cell does not appear in the ejaculate the next day.

This is why genuine changes in spermatogenesis generally require **weeks to months**.

The new WHO recommendation of waiting at least 11 weeks before repeating an abnormal semen analysis reflects this biological reality.



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Advertisements promising major changes in sperm quality within a few days should therefore be viewed cautiously.

What Patients Should Avoid

A patient with OAT should avoid several common mistakes.

Do not treat yourself with testosterone.

Do not assume every abnormal report is caused by infection.

Do not take antibiotics repeatedly without evidence.

Do not rely solely on one semen sample.

Do not spend many months taking supplements while severe oligozoospermia remains genetically or hormonally unexplored.

Do not assume abnormal morphology means abnormal children.

Do not assume OAT means permanent sterility.

And do not delay appropriate assisted reproduction indefinitely when female age or ovarian reserve makes time important.

Frequently Asked Questions

What are combined sperm abnormalities?

The term generally describes two or more abnormal semen parameters occurring together, such as low sperm concentration, reduced motility and abnormal morphology.

When all three occur simultaneously, the pattern is called **oligo-astheno-teratozoospermia (OAT)**.

What does OAT stand for?

O = Oligozoospermia — low sperm concentration.

A = Asthenozoospermia — reduced sperm movement.

T = Teratozoospermia — reduced normal sperm morphology.

Is OAT the same as infertility?

No.

OAT increases the probability of male-factor infertility, especially when abnormalities are severe.

But the diagnosis of infertility belongs to the reproductive situation of the couple, not to one laboratory value alone.

WHO and EAU emphasize that semen reference limits are not absolute fertility boundaries.

Can a man with OAT achieve pregnancy naturally?

Yes, in some cases.

The chance depends upon severity, total motile sperm number, duration of infertility and the female partner's fertility.

Mild OAT and extremely severe OAT have very different prognoses.

What causes OAT?

Common or important causes include varicocele, impaired testicular function, hormonal disorders, genetic abnormalities, anabolic steroids, previous undescended testes, testicular injury, infection, cancer treatment, metabolic disease and idiopathic infertility.

Can varicocele cause all three abnormalities?

Yes.

Varicocele may adversely affect concentration, motility and morphology in some men.

Appropriately selected infertile men with a clinical varicocele and abnormal semen parameters may benefit from repair.

Does morphology below 4% mean natural pregnancy is impossible?

No.

Morphology is one component of fertility assessment.

A value below the reference range may reduce reproductive potential, particularly when other abnormalities coexist, but it does not prove sterility.



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Does 4% normal morphology mean 96% of sperm are genetically defective?

No.

Morphology measures microscopic shape according to strict laboratory criteria.

It is not equivalent to genetic testing.

Can poor motility improve?

Sometimes.

Improvement depends upon the cause.

Varicocele treatment, correction of hormonal or lifestyle problems and removal of gonadotoxic exposures may improve motility in selected patients.

Can OAT be temporary?

Yes.

Recent significant fever or illness can temporarily affect semen parameters.

This is one reason repeat semen analysis is important.

When should semen analysis be repeated?

The 2025 WHO infertility guideline suggests repeating an abnormal semen analysis after a **minimum of 11 weeks**.

Clinical circumstances may justify a different schedule, but one abnormal report should generally not be treated as permanent without confirmation.

Which hormone tests are important?

FSH and testosterone are particularly important in significant male-factor infertility, with LH and prolactin added according to the clinical and hormonal pattern.

Does every OAT patient need genetic testing?

No.



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Genetic testing becomes more important when sperm concentration is extremely low or examination and hormones suggest severe impaired sperm production.

When is karyotype testing considered?

The 2024 AUA/ASRM guideline recommends karyotype testing particularly in men with primary infertility and azoospermia or sperm concentration below **5 million/mL** when elevated FSH, testicular atrophy or other evidence suggests impaired sperm production.

When is Y-chromosome microdeletion testing considered?

Current 2024 AUA/ASRM guidance particularly recommends it in primary infertility with azoospermia or sperm concentration **≤1 million/mL** when clinical evidence indicates impaired sperm production.

Do I need sperm DNA fragmentation testing?

Usually not as the first test.

AUA/ASRM does not recommend routine sperm DNA fragmentation testing during the initial infertility evaluation.

It may become useful in selected situations such as recurrent pregnancy loss or repeated ART failure.

Can antioxidants cure OAT?

Some studies show improvements in semen parameters, but evidence for clinically important fertility outcomes remains uncertain.

The 2025 WHO guideline therefore did not make a recommendation for or against antioxidant supplements for male-factor infertility.

Can testosterone improve OAT?

External testosterone can actually worsen sperm production.

Men interested in current or future fertility should not receive testosterone monotherapy as a sperm treatment.



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Can smoking affect all three sperm parameters?

Smoking has been associated with poorer semen quality and increased oxidative stress.

Stopping smoking is sensible reproductive-health advice, although it cannot guarantee normalization of severe OAT.

Is IUI useful for OAT?

It may be useful in selected mild or moderate cases.

When fewer than approximately **5 million motile sperm remain after laboratory processing**, AUA/ASRM notes that IUI pregnancy chances become limited and IVF/ICSI may be considered.

Is ICSI useful for severe OAT?

Yes.

ICSI is one of the most important technologies for severe male-factor infertility because one viable sperm can be injected directly into an egg.

AUA/ASRM notes that ICSI can overcome much of the adverse effect of poor sperm concentration, motility and morphology when viable sperm are available.

Does ICSI guarantee a baby?

No.

ICSI assists fertilization.

Successful pregnancy and live birth also depend upon egg quality, embryo development, female age, uterine factors and other reproductive variables.

Can Unani medicine help combined sperm abnormalities?

Published Unani research has reported improvement in selected semen parameters in some men with idiopathic oligospermia.

However, direct high-quality evidence specifically proving treatment of modern, rigorously defined OAT remains limited.



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For this reason, I consider Unani medicine most appropriately as part of an **individualized integrative plan after hormonal, genetic, testicular, varicocele-related and other important causes have been assessed.**

A Message From Dr. Nizamuddin Qasmi

When a patient brings me a report showing:

“Count low, motility low, morphology abnormal,”

I do not simply tell him:

“Your sperm are weak.”

That statement is too vague to help him.

I want to know:

Why is the concentration low?

Why are sperm not moving properly?

Why is morphology abnormal?

Is there a varicocele?

Are the testes normal in size?

What is the FSH?

Is testosterone normal?

Is the patient taking anabolic hormones?

Was there a childhood testicular problem?

Was there recent fever?

Could there be a genetic cause?

And just as importantly:

What is the fertility status of his wife or female partner?

This is how combined sperm abnormalities should be approached.

OAT Does Not Define Masculinity

I also tell patients very clearly:

A semen-analysis report is not a measure of masculinity.



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You may have:

excellent erection, normal libido, normal ejaculation

and still have abnormal sperm.

Another man may have perfectly normal semen parameters and significant erectile dysfunction.

Fertility, sexuality and masculinity are not the same thing.

Men deserve respectful reproductive care without stigma.

Why I Prefer Cause-Based Treatment

Suppose three men all have OAT.

One has a clinical varicocele.

Another has severe hormonal suppression from testosterone injections.

The third has genetically impaired spermatogenesis.

If we give all three exactly the same “sperm medicine,” we are ignoring the actual diseases.

This is why I prefer:

Diagnosis → Cause identification → Individual treatment → Objective semen reassessment → Couple-based fertility planning.

Unani medicine can be incorporated within this framework rather than being used instead of it.

Current Medical Understanding

The latest evidence gives us several important lessons.

First, **multiple semen abnormalities matter more than one isolated mildly abnormal parameter.** AUA/ASRM specifically emphasizes increasing infertility risk as abnormal parameters accumulate.

Second, the **WHO sixth-edition reference values are not strict fertility cutoffs.** They should be interpreted as part of the complete reproductive picture.

Third, the **2025 WHO global infertility guideline recommends repeating an abnormal semen analysis after at least 11 weeks**, reflecting the biological cycle of sperm production.



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Fourth, severe combined abnormalities can justify deeper hormonal and genetic evaluation, with the 2024 AUA/ASRM update refining genetic-testing thresholds.

Fifth, there is currently **insufficient evidence to recommend routine antioxidant supplements universally** for abnormal semen parameters.

And finally, modern reproductive technologies—particularly **ICSI**—have significantly improved the prospects of biological fatherhood for men with severe OAT.

Conclusion

Combined sperm abnormalities occur when more than one major semen parameter is abnormal.

The most important combined pattern is:

Oligo-Asthenoteratozoospermia — OAT

This means simultaneous abnormalities involving:

sperm concentration, sperm motility and sperm morphology.

OAT is not itself the underlying disease.

Possible causes include:

varicocele, primary testicular dysfunction, genetic abnormalities, hormonal disorders, undescended testes, testicular injury, infection, anabolic steroids, testosterone use, cancer treatment, obesity, smoking, environmental exposure and unexplained male infertility.

Current international guidance emphasizes that:

one abnormal semen analysis should not automatically establish a permanent diagnosis;

abnormal results should be confirmed;

semen parameters should be interpreted together rather than separately;

and both members of the couple should be evaluated.

The **2025 WHO infertility guideline** now suggests repeating abnormal semen parameters after at least 11 weeks.

Treatment should then address the cause.

This can include:



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varicocele management, correction of endocrine abnormalities, stopping gonadotoxic hormones such as anabolic steroids, appropriate treatment of infection, lifestyle and metabolic improvement, and genetic counselling where indicated.

When the sperm abnormalities remain severe, fertility options may include:

IUI in selected patients or IVF with ICSI when male-factor impairment is greater.

ICSI is particularly important because it can overcome much of the adverse effect of poor sperm concentration, movement and morphology when viable sperm are available.

From the **Unani perspective**, male infertility can be considered in the context of reproductive function, Mizaj, nutrition, digestion, lifestyle, physical health and sexual wellbeing.

Published Unani clinical research has reported improvements in some semen parameters in idiopathic oligospermia, but evidence specifically for modern OAT remains limited and stronger randomized trials with pregnancy and live-birth outcomes are still needed.

At **Saira Health Care**, my preferred approach is therefore integrative but firmly diagnosis-led:

confirm the abnormality, identify why several sperm parameters are affected, correct reversible causes, assess the couple together, use individualized Unani supportive treatment where clinically appropriate, and move toward assisted reproduction when that provides the most realistic chance of pregnancy.

My most important message to patients is:

Do not treat OAT simply as “weak sperm.”

Low count, poor movement and abnormal morphology together are telling us that the male reproductive system deserves a proper evaluation.

Once we understand the reason, we can develop a much more rational treatment and fertility plan.

About the Author

Dr. Nizamuddin Qasmi

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Dr. Nizamuddin Qasmi's clinical work at **Saira Health Care** focuses on sexual disorders, male reproductive health and infertility.

His approach to combined sperm abnormalities emphasizes careful evaluation of sperm concentration, motility and morphology together with hormonal, genetic, anatomical, lifestyle and sexual-health factors.

Where clinically appropriate, Unani principles are integrated with contemporary semen analysis, hormonal evaluation, genetic assessment, urological investigation and fertility-treatment planning.

Medical Disclaimer

This article is intended for health education and general public awareness. It does not establish an individual diagnosis and does not replace consultation, examination or treatment by an appropriately qualified fertility specialist, reproductive urologist or other healthcare professional.

Combined sperm abnormalities can result from hormonal, genetic, anatomical, testicular, lifestyle and treatment-related conditions.

Men should not begin testosterone, anabolic hormones, prescription fertility medicines, antibiotics, high-dose supplements or herbal/Unani preparations solely on the basis of a semen-analysis report without appropriate professional evaluation.

Men with extremely low sperm concentration, small testes, markedly elevated FSH, suspected genetic infertility, testicular masses or persistent severe semen abnormalities should receive appropriate specialist investigation.

Fertility treatment should be planned for the **couple**, because female age, ovarian reserve, tubal function and other reproductive factors substantially influence the appropriate timing and choice of treatment.