

Azoospermia (no sperm in semen)

Who is this leaflet intended for?

This leaflet is intended for anyone who has been given results from a semen analysis test where no sperm have been detected (azoospermia). It may be useful for anyone that is interested in the subject or is supporting their partner who has been given this information. This leaflet aims to describe what is meant by azoospermia, what it may be caused by, any additional tests that could be undertaken and what this means for you if you want to have a family. It contains quite a lot of information on the subject although it will not cover everything in great detail. Please contact your doctor or Healthcare Professional (HCP) for further advice if this is required. There is a glossary of terms at the end of this leaflet.

What is Azoospermia?

This is a term used when sperm are not detected in a semen sample analysed in a laboratory. It is often only used when a patient has had at least two semen samples analysed. This term is not always used and instead you may hear other descriptions such as 'zero sperm count' or 'no sperm seen'.

What happens after this?

A HCP will review your results carefully. If it was your first sample, another semen sample should be provided and analysed as soon as possible. You may be asked to have blood tests and possibly be referred to a specialist (Urologist or Andrologist) for review. The specialist will ask you some questions relating to your current and past medical history, as well as undertake a physical examination of you. Once all your results have been received, more tests may be required or a management plan will be given. This management plan will depend on what has caused the azoospermia (if this can be found).

What tests may be undertaken?

This will depend on your clinical history and what you have had done already. The following tests may be part of this:

Azoospermic Factor (AZF) Microdeletion Testing: a specialist test usually undertaken if no other identifiable causes can be found. The test looks for deletions in particular regions of the Y chromosome. It is important as it can differentiate between patients where sperm can be surgically retrieved from the testes and from those where it may not be possible.

Cystic Fibrosis mutation: this is a specific test often undertaken in patients when the cause is likely to be obstructive (see causes section). The test is undertaken to identify any potential mutations in the cystic fibrosis transmembrane conductance regulator (CFTR) protein. Some people may not be aware that they are carriers of mutations, and this can impact fertility.

Follicle Stimulating Hormone (FSH): a hormone produced by the pituitary gland (an area in the brain) that stimulates the Sertoli cells in the testes to support sperm production. It also increases other substances required for sperm production and control of this process (androgen-binding protein, transferrin, inhibin and aromatase).

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Karyotyping: this blood test looks at the number of chromosomes an individual person has. A chromosome contains the genetic information inherited from your parents. There should be 23 pairs of chromosomes, 22 of which are the same for everyone, with the 23rd pair being the sex chromosomes (an X and Y in patients assigned male at birth).

Luteinising Hormone (LH): a hormone produced by the pituitary gland that acts on Leydig cells in the testes to produce testosterone. This leads to intratesticular testosterone levels (inside the testicle) approximately 100 times greater than what is circulating in your blood.

Physical Examination: the specialist will ask you some clinical questions relating to your history including any relevant infections or sexual behaviours. They will also undertake an examination of your abdomen, penis and testes.

Prolactin (PRL): a hormone produced by the pituitary gland. The specific role of prolactin in men is not clear, but an increase in this hormone can result in a reduction of follicle stimulating hormone, luteinising hormone and testosterone.

Sex Hormone Binding Globulin (SHBG): a protein responsible for binding to testosterone and transporting it around the body in the blood.

Testosterone: a hormone, also known as the 'male' hormone. It is needed for puberty and changes in sexual characteristics, sperm production, libido and erection function. Women do have this hormone, just at much smaller concentrations.

Thyroid Stimulating Hormone (TSH): a hormone produced by the thyroid, (a gland located in your neck). Thyroid function can be associated with fertility issues if it is underactive or overactive.

Ultra Sound: this test is often used if confirmation is needed of cysts, varicose veins in the scrotum or determination of testicle size.

What can cause azoospermia?

Azoospermia can be divided into different categories; obstructive azoospermia or non-obstructive azoospermia. The non-obstructive azoospermia category can be further broken down into pre-testicular (hormone abnormalities impacting sperm production) and testicular (issues originating from the testes that affect sperm production). Here are some examples of non-obstructive azoospermia causes:

- Primary hypogonadism (hypogonadotropic hypogonadism) - reduction in testosterone production due to testicular causes; leading to an increase in follicle stimulating hormone/luteinising hormone and a reduction in testosterone. This can be caused by injury, treatment for cancer, cryptorchidism (undescended testicle) or Klinefelter syndrome (a genetic disorder)
- Secondary hypogonadism (hypogonadotropic hypogonadism) – a disorder where the hypothalamus/pituitary may be affected leading to a reduction in follicle stimulating hormone, luteinising hormone and testosterone. This can be caused by Kallmann syndrome (genetic disorder), cancers or haemochromatosis (a disease of iron absorption)
- AZF microdeletions – this is a genetic disorder that means part of the chromosome is deleted in a specific region that affects fertility. There are many studies relating to this and if tested for, may indicate the likelihood of sperm retrieval through surgery

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- Cryptorchidism – generally a physiological issue of new-borns/infants where the testes have not descended. If this is not corrected early (within first 6 months) there may be a significant impact on sperm production
- Recreational drug use – generally speaking, anything that affects the hormone balance of follicle stimulating hormone, luteinising hormone and testosterone may impact fertility. It is more common to see azoospermia in those that are using anabolic steroids or testosterone supplements. This may include patients who have tried to cycle, pyramid or plateau regimes and even those who have stopped using steroids

Obstructive azoospermia is more common and can be indicated at any point along the reproductive tract. It can be caused by infection, injury, surgical intervention or from a defect at birth (congenital). Examples of causes of obstructive azoospermia include:

- Congenital bilateral absence of the vas deferens (CBAVD) – seen in many cystic fibrosis patients
- Epididymis obstruction
- Previous scrotal or inguinal surgery
- Hernia repair
- Vasectomy
- Young syndrome – a genetic disorder

The exact cause will be determined from a combination of blood tests, physical examination and clinical history.

Does having azoospermia mean I cannot have children?

Some patients may not be able to whilst others may need further investigation and surgical intervention. There are some patients that may need to have pharmacological treatment or make some major lifestyle changes. It depends on the actual reason for the azoospermia, if one can be found.

What treatment options are available?

This will depend on the cause. In some cases, surgery may be undertaken to correct an obstruction. If this cannot be achieved, it may be possible to retrieve sperm directly from the testicle or epididymis (the lumpy structure on your testicle that stores sperm). Other people may require hormone therapy to counteract any imbalances whilst being supervised by a medical team. This may take some time before there is noticeable improvement in sperm production.

Those patients, who have made lifestyle choices i.e. anabolic steroid use, will be advised to stop this. Once stopped, a repeat test is often undertaken in 3-6 months to see if the effects have been reversed.

- Counselling may be offered to some patients where there is a genetic cause for their infertility. This is so that you and your partner are aware of the impact that this may have on any children that may be born. It is also your chance to talk to an expert in the field and understand what this is.

There are, however, cases where the problem cannot be rectified or where sperm are unlikely to be retrieved from the testicle or epididymis. In these cases, you may need to look at alternative options including donor sperm or adoption. Help and support will be offered to you and your

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partner to give you moral support and to discuss options with other groups and/or professionals with experience in this area. We understand that this may be a shock, and always advise anyone struggling to ask or look for support.

Is there any support for me or my partner?

Talk to your doctor, nurse or andrologist if you wish to discuss anything contained within this leaflet or if you have any further questions. They are there to help you and give you information if you need it.

Listed below are some organisations that may be able to help you, although specific organisations may exist for your particular cause of azoospermia, so please ask for more specific direction.

Fertility network

Web address: <https://fertilitynetworkuk.org/>

Information line: **01424 732361**

Fertility Friends:

Web address: <https://www.fertilityfriends.co.uk/>

British Infertility Counselling Association (to locate a counsellor):

Web address: <https://www.bica.net/>

Men's Health Forum:

Web address: <https://www.menshealthforum.org.uk/>

There are many specialist web pages on male health and support, if you access these please ensure you talk to a HCP about the information you receive. It is possible that information on some websites may not reflect current guidance and may give you incorrect information.

Some sites that may be used include:

<https://www.nhs.uk/common-health-questions/mens-health>

<https://the-waitingroom.org>

<https://www.menshealthandsupport.com>

<https://uk.movember.com/mens-health/general>

Further Information

You are encouraged to contact the person looking after you/your partner. This may be a Consultant, Nurse or Allied HCP.

Fertility Clinical Nurse Specialists:

Telephone: **0121 4249758**

Email: FertilityServicesUHB@uhb.nhs.uk

Alternatively you can contact Andrology:

Telephone: **0121 424 9717**

Email: Andrology@uhb.nhs.uk

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Explanation of terms used in this leaflet

Andrology

A term used to describe the area of medicine/healthcare relating to men.

Azoospermia

No sperm detected (seen) in a semen sample.

Chromosome

Any of the rod-like structures found in all living cells, containing the chemical patterns that control what an animal or plant is like.

Congenital

A congenital medical condition is one that a person has had since they were born.

Cryptorchidism

A condition in which a man's scrotum contains only one testicle or no testicles. They are usually absent as they are located in the body in the lower abdomen. Generally, this is likely to occur when a child is born although can be detected through infancy/adulthood.

Epididymis

A tube that carries sperm from the testes. They are attached to the testes and join with other structures in the male.

Genetics

A branch of science, that relates to the study of genes or directly relates to genes. Genes are a pattern of chemicals within a cell that carries information about the qualities passed to a living person from their parents.

Hernia

A hernia is when an internal part of the body pushes through a weakness in the muscle or surrounding tissue wall, sometimes creating a bulge.

Hormone

A hormone is a chemical substance in the body that is produced to regulate or control cells or other parts of the body.

Inguinal Surgery

Relating to surgery of the groin.

Kallmann Syndrome

A condition that causes delayed or absent puberty, loss of smell and fertility issues. It is a form of hypogonadotropic hypogonadism. There may be other issues associated with the syndrome, such as micropenis/cleft lip. There are some genetic causes for the disorder (up to 30%) with other causes unknown.

Klinefelter Syndrome

Klinefelter syndrome (sometimes called Klinefelter, KS or XXY) is where boys and men are born with an extra X chromosome. Normally, the 23rd pair of chromosomes of men contain an XY, whilst women have an XX pair.

Protein

Vasectomy

Young's Syndrome

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There are approximately 20 lines visible. The paper has a slight shadow on its right side, suggesting it's resting on a surface.

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