Fertility Test

**Fertility Testing**

If your General practitioner, medical doctor, does not know which test to order please down load the recommended test provided by Dr. Jason Hitkari from Genesis Fertility Centre. [Click here](http://www.acubalance.ca/fertility-test-take-your-vancouver-doctor)

At Acubalance we don't just want to help you become pregnant. We share in your desire to have a healthy baby and family. This means helping you and your partner reach your full fertile potential during the time of conception and throughout your pregnancy. Fertility testing is an important part of our approach.

We don't want to leave any stone unturned when it comes to uncovering the cause of your infertility. So, along with your personalized Chinese medicine diagnosis, we recommend that both partners have a comprehensive fertility testing.

In addition to the basic fertility testing done by your fertility specialist we offer some additional tests that may help reveal any underlying issues that are preventing you from conceiving and/or carrying to term. Many couples prefer to have this comprehensive testing done before pursuing more costly treatments.

**What is infertility?**

In North America most one in six couples have trouble getting pregnant and that number increases to more than 50% after the age of 39. Studies show that trouble conceiving is 40% female factors, 40% male factors, and 20% a combination of both.

Often there is no single cause and both partners may be contributing to your inability get pregnant. However calling this 'infertility is really a misnomer True infertility is relatively rare and it refers to specific conditions including:

* Women with blocked fallopian tubes
* Women that have no uterus
* Women that have no egg follicles (due to menopause or premature ovarian failure)
* Men who have no sperm

In these situations, you can only pregnant with IVF and ins some cases the use of a third party to provide eggs, sperm or a uterus to carry the pregnancy.

**Sub-Fertility**

Any other diagnoses in couples are more accurately called sub-fertility. In these cases, although your chances are less than the average, you still may be able to conceiving naturally. At Acubalance we are trying to maximize your odds of conceiving by addressing any underlying conditions or imbalances that are contributing to your subfertility. In other words we are helping to "cultivate the soil," boosting your overall health and optimizing your fertility potential to conceive naturally or with IVF.

**When should you seek help for fertility?**

You should get a fertility workup if you:

* Are 35 or under and have been trying to conceive for 12 months
* Are 36 or older and have been trying to conceive for 6 months
* Don't have regular menstrual cycles
* Not sure if you are ovulating
* Have a history of Chlamydia (increases risk of blocked and/or damaged fallopian tubes)
* Suspect you have a problem

**Fertility testing for women**

**History**: A full physical and social history is essential. This include doing an complete medical history both past and present including developmental issues ( eg late onset of menstruation), use of medications, sexual history, use of proper lubricants, occupation (exposure to toxins) and emotional health.

**Physical exam:** This includes a BMI, blood pressure, secondary sexual sex characteristics, pap smear.

The basic infertility workup consists of a series of tests that evaluate fertility factors including

* Ovulation
* Egg quality
* Fallopian tubes
* Health of the uterus
* Sperm

The following is a list of typical tests used to assess your fertility and to prepare for pregnancy:
Ovarian reserve testing – there are several different ways to assess your ovarian reserve. Common tests include:

* Day 3 FSH (follicle-stimulating hormone)
* Antral follicle count: If ovarian reserve or egg supply is in question, this simple ultrasound is often used
* Clomiphene citrate challenge

These tests are used to evaluate the health of your fallopian tubes and uterus

* Hysterosalpingogram (HSG)—this is a diagnostic x-ray that allows a study of your uterus and fallopian tubes
* Hysteroscopy—this is a procedure where the doctor passes a hysteroscope—a narrow, telescope-like instrument with a camera on the end—through your vagina and cervix and into the uterus to directly examine the interior of your uterus.

Blood tests

* Prolactin High prolactin levels can suppress ovulation. It is generally associated with lactation, but can be abnormally high for other reasons as well.
* Thyroid stimulating hormone (TSH) Thyroid evaluation varies greatly depending on the country, city and clinic; however, recent studies have shown that ideal values for fertility are < 2.5mIU/L.
* VZV IgG (to test chicken pox exposure)
* Rubella titre
* Complete blood count
* Blood type
* HIV, hepatitis B, hepatitis C, syphilis testing

Additional blood tests

* APA: If you have a history of 3 miscarriages or more, it would be worthwhile to get tested for antiphospholip antibodies in your blood. These are more commonly found in women with a history of autoimmune disease
* Day 21: This test is not done as often as the Day 3s and assesses levels of progesterone in your blood, basically let you and your healthcare provider know whether or not you have ovulated
* Ovarian Assessment Report: OAR's are a more in depth look at ovarian reserve. In addition to FSH and estradiol, the OAR measure inhibin B, Antimullarian hormone and Luteinizing hormone. When reviewed together, a much more accurate assessment of the ovarian reserve and fertility potential can be achieved.

**Tests to determine the health of your uterus and fallopian tubes**

Hysterosalpingogram (HSG): This is an X-ray of your fallopian tubes and uterus, preceded by the injection of a dye, which allows the visualization of both the uterus and fallopian tubes. Blockages or physical abnormalities in the tubes and uterus can be revealed through this procedure.

Hysteroscopy: This procedure is usually often done if there is suspicion of endometriosis, fibroids or adhesions (Asherman's syndrome).

**MEN'S FERTILITY**

Semen Analysis includes

* Count
* Motility (movement)
* Morphology (shape)

Blood tests for infectious diseases

* HIV1 -Antibody
* HTLV 1 Antibody
* Hepatitis B-surface Antigen
* Hepatitis C-Antibody
* RPR

**Women's Fertility**

Ovulation

At the beginning of the menstrual cycle, an egg begins to develop in the ovary. After approximately two weeks of growth, the egg is released or "ovulated". Following ovulation, the ovary produces the hormone progesterone to prepare the lining of the uterus for implantation of the embryo.

How do you know if you are ovulating?

1. The basal body temperature graph (BBT) detects ovulation by showing a rise in the temperature (usually to greater than 98 degrees). The temperature is taken orally for 3 minutes immediately upon awakening. Ovulation generally takes place within the 24 hours before the temperature elevation. The BBT is most useful for reviewing the timing of tests and intercourse/insemination, but does not predict ovulation.

2. Ovulation Predictor Kits (OPK) detect the LH hormone surge in the urine. LH is the hormone that triggers ovulation. These kits are the only method for predicting when ovulation will occur. For most kits, once a positive result is obtained ovulation will occur within 24 hours. OPKs are most useful for confirming that an LH surge has occurred, and for timing of tests and intercourse/insemination.

3. The serum progesterone test determines if the ovary is secreting sufficient hormone levels for optimal uterine preparation. The preferred progesterone level is 10 ng/ml or greater when measured 7-9 days after ovulation (as determined by BBT or urinary LH kit).

Hormonal abnormalities

Abnormalities in the levels of other hormones can interfere with the normal process of growing and ovulating an egg. These hormones are routinely checked as part of the hormonal/ovulation evaluation and include TSH (thyroid) and Prolactin.

LH – Luteinizing Hormone

This is a test which is often done on day 3 of the cycle. Having a high LH level will result in increased ovarian testosterone production, altered estrogen production, and abnormalities with ovulation.If your LH is higher than the FSH by 2:1 ratio, it can indicate polycystic ovarian syndrome. Normal day 3 range : <7 mIU/mL

Estradiol

Measured on day 3 of the cycle. If elevated, estradiol can lower the FSH, thereby masking elevatedFSH levels. This can happen in cases of low ovarian reserve or functional cysts. Estradiol can be low in conditions of low ovarian reserve. Women who have estradiol over 294 pmol/L (or 80 pg/ml) have a lower chance of success with an IVF cycle since they will not respond to stimulation as well.

Progesterone

This is often measured on day 21 It is used to determine whether ovulation has occurred as a healthy corpus luteum produces progesterone. It is important to measure progesterone 7 days after your ovulation, measuring on day 21 only applies to women who ovulate on day 14. Levels higher than 16 nmol/L strongly suggest an ovulatory cycle.

Cortisol

Often measured in the morning can indicate the impact of stress on the reproductive system. Elevated cortisol can affect ovarian circulation and function. Normal levels : 250 – 850 nmol/L taken between 6-8am. Low cortisol can be found in congenital adrenal hyperplasia. Normal levels for am cortisol 101-536 nmol/L

Testosterone

The total level of testosterone in the system. If elevated this can indicate polycystic ovarian syndrome. High testosterone can interfere with normal ovulation often causing delayed ovulation or anovulation. Levels can also be low around which can negatively affect ovarian function. Normal levels for females 0.3- 4.0 nmol/L

Free testosterone

The amount of testosterone that is not bound to carriers and is available to stimulate tissues. The higher this is the more androgenic effect on the tissues. This can be elevated in PCOS and specific adrenal conditions such as non-classical congenital adrenal hyperplasia (non classical CAH). Normal levels for females 0.1-8.9 pmol/L

Prolactin

A hormone normally elevated in nursing and pregnancy. If elevated in other situations it can interfere with ovulation and fertility. It can be elevated due to stress, medications such as antidepressants or painkillers, thyroid disease, or pituitary conditions such as microadenomas. Normal levels in women 3.3– 26.7 ug/l.

**Other Fertility Tests**

DHT – Dihydrotestosterone

A form of testosterone which is very potent. DHT Can be elevated in pcos or enzyme conversion disorders resulting in androgen excess signs and symptoms. Serum testing for DHT is often unreliable.

Sex hormone binding globulin

Can be low in patients with androgen excess conditions such as pcos or in hypothyroidism. Can be high in non classical CAH, hyperthyroidism. Normal levels : Follicular phase 24 – 200 nmol/L, Luteal phase 48 – 185 nmol/L

HbA1C

A long termarker of insulin resistance and blood glucose control. Can be elevated in pcos. Marks the previous 3 months of blood glucose control. Normal levels 0.040 – 0.060

DHEA – S

A precursor to hormones, most especially androgens. DHEA is made by the adrenal gland. Levels tend to reduce with age and can be reduced in low ovarian reserve. Levels can be elevated in PCOS. Normal range for women 0-11 µmol/liter

Ferritin

A marker for stored iron. Levels can be low in patients with infertility. I recommend ferritin levels of above 50.

**Egg quality**

**FSH Follicle Stimulating Hormone**

**Day 3 FSH**

**What is a day 3 FSH?**

One of the ways to evaluate your fertility potential is to measure the concentration of the follicle stimulating hormone (FSH) on the 3rd day of your menstrual cycle. As a woman ages the number of eggs in her ovaries declines. As egg number or reserve declines the FSH level increases.

**What is a day 3 FSH test used for?**

It helps predict how well you might respond to the fertility medications used in assisted reproductive technologies (ART) like superovulation, IVF, and ICSI. The FSH level gives a rough idea how your ovaries are responding and if you are approaching menopause.

Although day 3 FSH levels may vary from cycle to cycle, it is the highest level of FSH on day 3 that is associated with the potential outcome of treatment.

The methods used to measure the FSH level vary from clinic to clinic, and thus the level above which the FSH is considered to be elevated will vary among clinics. Most Vancouver IVF clinics like day 3 FSH levels to be below 10.

Your physician may use other estimates of ovarian or egg reserve such as a clomiphene challenge test or an antral follicle count.

Many women with high FSH become pregnant when egg quality and ovarian health is worked on so having a high FSH is not untreatable.

FSH Levels (Day 3)
Excellent - less than 6 mIU/mL
Good - 9 mIU/mL
Low 10-13 mIU/mL
Very Low - above 13 mIU/mL

**Antral Follicle Count**

**What is an antral follicle count?**

An antral follicle count is a vaginal ultrasound examination of the ovaries used to determine the number of antral follicles in each ovary. An antral follicle is a tiny (2-10mm) fluid-filled structure that contains an immature egg. As a woman ages the number of eggs or follicles in each ovary declines.

**What is an antral follicle count used for?**

Much like day 3 FSH testing, the antral follicle count (AFC) gives us an estimate of the number of eggs in your ovaries at a given time. An AFC is done prior to IVF or ICSI to help us predict how well you might respond to the fertility medications.

A woman's day 3 FSH level can vary from month to month while the AFC varies less so. There is no single number of antral follicles that is considered low or high – a woman's age and medical and fertility history are considered, along with her AFC to estimate her ovarian reserve. Typically, an AFC > 10 is reassuring, while an AFC < 5 is worrisome.

**Clomiphene Citrate Challenge Test**

What is a clomiphene citrate challenge test? This test, called "a provocative test," is used to assess your fertility potential or ovarian reserve function.

**Who is a clomiphene citrate challenge for?**

This test gives us more information about your ovarian reserve if you have:

* Borderline high day 3 FSH level
* History of poor response to the stimulation of egg growth in a previous cycle of an ART
* Increasing female age

**What does the test involve?**

The test involves first measuring the cycle day 3 FSH and estradiol blood level. Then, after you take 2 tablets per day of clomiphene citrate (Clomid, Serophene) each morning from day five to day nine of the cycle, we do a repeat measure of your FSH and estradiol blood levels on cycle day 10 (the day after completing the clomiphene tablets).

**Special Ovarian Reserve Markers**

AMH

Antimullerian hormone is produced by growing follicles and prevents premature recruitment of primordial follicles. The value of the amh generally correlates with the number of functional primordial and antral follicles remaining in the ovary. Generally, the higher the AMH, the more healthy follicles are in the ovary
Antimullerian hormone can predict the age of onset of menopause with some degree of accuracy. Low AMH often does not give a good prognosis for IVF because IVF is based on the stimulation of multiple follicles – women with lower AMH tend to get fewer follicles during IVF stimulation. However, even if AMH is low, conception is possible as even if there are not many follicles remaining in the ovary, their quality can be improved with treatments. Natural conception with low AMH can and does happen.

Normal ranges

AMH Levels

Low 0.0 to 0.3 ng/ml
reduced 0.3 to 0.7 ng/ml
Satisfactory 0.7 to 3.5 ng/ml
High Level found in PCOS >3.5 ng/ml

Inhibin b

A marker of ovarian function and reserve, this protein is secreted by small developing follicles and works to inhibit FSH levels, hence the name inhibin. This test is completed on day 3 of the cycle. As inhibin is secreted by the follicles, it can indicate the number of and function of the remaining folliciles. This test is not widely available. satisfactory = above 65 pg/ml and reduced = below 65 pg/mL Inhibin B is a spectrum however, and this line is a general guideline not a strict cutoff. Like with AMH even if inhibin B is low, conception is possible if the health of the remaining follicles is enhanced.

**TSH -thyroid stimulating hormone**

The ideal level is 1 – 2.5. Levels above this can put the patient at risk for early miscarriage. Normal Ranges are : 0.4 – 4 mIU/L. If levels are above 3, and especially if thyroid antibodies such as antithyroglobulin and anti-thyroid peroxidase are present with signs and symptoms of hypothyroidism, this and may present risks for fertility.

Other tests for ovarian health

Vitamin D
Important for overall health, hormone balance, and stress levels. Normal levels of 1, 25 Hydroxy Vitamin D 40 -150 pmol/L

Homocysteine

A marker of inflammation and circulatory health. This test is only recently being found to be important for ovarian health. Elevated levels can be found in autoimmune conditions, ovarian aging and endometriosis. Normal range : 4.7 – 14.1 umol/L

INR

A measure of blood clotting. Blood which clots excessively may interfere with implantation. Can also elevated in endometriosis or fibroids. Normal value for INR 0.9 – 1.2

**Anti sperm antibodies**

The presence of anti- sperm antibodies in women can destroy or damage the sperm before they have the chance to fertilize the egg. Around 5% of infertile women have these antibodies in their bloodstreams.
Anti thyroid antibodies

These include antithyroid peroxidase and antithyroglobulin. These antibodies, if present will reduce fertility even if thyroid function is normal. They can cause alterations in thyroid function and also can be cross reactive with ovarian tissue. Women with PCOS who don't respond to clomid may have antithyroid antibodies.

**Anti nuclear antibodies**

These antibodies are present in autoimmune disease such as Lupus and Sjogrens syndrome.

**Fallopian Tubes**

**Hysterosalpingogram**

**What is a hysterosalpingogram?**

A hysterosalpingogram (HSG) is an X-ray test that looks at the inside of your uterus and fallopian tubes.

**What is a hysterosalpingogram used for?**

* A hysterosalpingogram shows:
* Abnormalities in the uterus or fallopian tubes
* Blockages preventing the egg from moving through a fallopian tube to the uterus
* Blockages preventing the sperm from moving into a fallopian tube and fertilizing the egg
* Problems on the inside of the uterus preventing a fertilized egg from attaching to the uterine wall

**What does a hysterosalpingogram involve?**

During a hysterosalpingogram, a radiologist injects a dye through a thin tube that is inserted through the vagina and into the cervix. The radiologist takes pictures using x-ray (fluoroscopy) as the dye flows through the uterus and into the fallopian tubes. If there is any blockage or problems with your uterus, this will show up on the x-ray.

Some women find this test to be quite "crampy," so we suggest that you take 2 tablets of Ibuprofen (e.g. advil or Motrin) about one hour prior to the procedure.

**Health of the Uterus**

**Hysteroscopy**

**What is a hysteroscopy?**

A hysteroscopy is a procedure where the doctor passes a hysteroscope—a narrow, telescope-like instrument with a camera on the end—through your vagina and cervix and into the uterus to directly examine the interior of your uterus.

**What is a hysteroscopy used for?**

This procedure is used to determine if you have any fibroid tumours, polyps, scar tissue, or other obstructions that could be affecting your fertility.

**What happens during the procedure?**

During the procedure, the doctor inserts the hysteroscope into your uterus and may inflate the uterus with gas or saline liquid to get a better view of the uterine interior.

If the doctor finds anything abnormal, he or she may remove a small sample for further examination. You don't need to have an incision with a hysteroscopy, and most women recover within an hour or two.

Because many women find this test to be quite "crampy," we suggest that you take 2 tablets of Ibuprofen (e.g Advil or Motrin) about one hour prior to the procedure.

**Men's Fertility**

Sperm Evaluation

The semen analysis is the measurement of 4 different properties of a single ejaculate:

* Volume is the amount of the ejaculate measured in cc's
* Count is the concentration of sperm, measured in million of sperm/cc
* Motility is the percentage of sperm that are moving, i.e. living
* Morphology is the percentage of sperm that are normal in shape

The "normal" values for these parameters are greater than 2cc in volume, 20 million/cc in concentration, 50% motility, and 50% normal morphology. The presence of white blood cells in the semen may indicate an infection of the prostate or urethra, even if no symptoms are present.

If the semen analysis is persistently abnormal, a urological exam, more specific sperm testing and hormonal testing are recommended. The urological examination will check for the presence of anatomical abnormalities (varicocele, congenital absence of the vas deferens). More specific sperm testing might include more stringent morphology testing (Kruger morphology), or testing for the presence of white blood cells or antibodies. Hormonal testing includes measurement of Prolactin, FSH and Testosterone.

In Vancouver British Columbia most BC labs report poor morphology so if your test flags your morphology please ask us for a referral to one of BC's IVF clinics for a more detailed and accurate semen analysis.