

# BLOOD TEST BLUEPRINT BUNDLE

FOR FERTILITY, HAPPY HORMONES & THYROIDS



KNOW YOUR BLOODS BETTER

BY  
DR. MIRANDA MYLES



YOU'VE TRIED EVERYTHING, RIGHT?

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HAD EVERY TEST UNDER THE SUN?

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"EVERYTHING IS NORMAL", THEY SAY.

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. "RELAX AND JUST KEEP TRYING"

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BUT DO YOU ACTUALLY KNOW  
WHAT HAS BEEN TESTED?

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Often, when we look at what has been tested, there are omissions. Things have been missed. Bloods that should be part of standard testing have not been done. So, here is my list of the most essential standard blood tests, with a couple of advanced extras to boot.

DR. MIRANDA MYLES

# Hello I AM DR MIRANDA MYLES,

The Conception Queen, and all-round Women's Health  
& Fertility Expert.

I am a Naturopath, Acupuncturist, Author & Nutritional Biochemistry Lecturer helping you feel better in your body and bring your baby home sooner.

My mantra is Test Don't Guess- I am obsessed with pathology and I am known for my ability to accurately understand and easily explain blood test results to you understand your body' better. Be and become all you can be, naturally.

And I have been there. I know how unexplained (in)fertility feels with the torment of every period you did not want. In a nutshell it took me:

- 8 years, 15 embryos
- 9 rounds of IVF (3 using my own eggs, 6 using egg donor)
- 3 egg donors, 3 trips to Thailand, 4 trips to Malaysia
- 35,937 blood tests, 472,813 drugs, 8,703,471 supplements and natural medicines
- A gazillion appointments & a bazillion dollars
- Blood, sweat, tears. Magic baby dust.

And I am grateful to be a Mum to two adorable donor egg conceived children.



Together, we can fix your fertility, balance your hormones, regulate your period,  
improve your mood & energy, sleep like a baby, and make a baby.

CONCEIVE MORE EASILY, CREATE FERTILITY & FAMILY.

| DR. MIRANDA MYLES |

# IMPORTANT INFORMATION:

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The ranges that are included in this cheat sheet are for optimal levels, not normal reference ranges. Blood tests have very wide reference ranges, and conventional interpretation means as long as you fall in that range, you are told “your bloods are normal” and “you are fine”. But, if you sit at either the upper or lower end of the range, this can still be impacting your health. Rather than just sitting ‘in range’, I want you to be at optimal levels.

The ranges I have included are for a non-pregnant adult.

When you go to the lab to do your blood test, please always make sure it is first thing in the morning and fasting (even if you have been told it doesn’t matter). That means not eating or drinking anything before your blood is taken. Yes, that includes coffee. And tea. WATER only please.

Every time you have blood tests done, do it the same way- in the morning, fasting. And preferably with the same lab. Different labs have different reference ranges, so we want to always ensure we are using the same lab so that we are comparing the same set of results. Apples with apples.

NOTE on your hormone testing: When it comes to your hormones, it is also important to test FSH, LH & E2 on 2-3 of your cycle whilst progesterone needs to be tested on “day 21”, in a 28 day cycle. If however you have a shorter, longer or variable cycle length, take your average cycle length and test progesterone 7 days before your next expected period. For example, if you have an average 32 day cycle, you will test progesterone on day 25 (7 days before your expected period), or 7 days post confirmed ovulation

Day 1 is the first day of your bleed.

# SEX HORMONES:



## FSH (Test day 2-3) < 6 IU/L

Follicle Stimulating Hormone stimulates the development of the ovarian follicles. High levels can lead to a reduced number and quality of eggs or indicate premature menopause. High FSH often presents with low oestrogen levels, which may be affecting the development of your eggs and uterine lining.

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## LH (TEST DAY 2-3) < 6 IU/L

Luteinising Hormone regulates the menstrual cycle by stimulating oestrogen and progesterone ovarian production and it triggers ovulation during mid cycle. High LH is often found in women with PCOS or it may indicate ovarian aging, where the ovaries do not respond to normal LH levels.

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## E2 (Test day 2-3) 100-200 pmol/L

Test day 2-3 result: *Low:* <120pmol/L *Ideal:* 120-200 pmol/L *High:* > 200pmol/L

Test 7 days post ovulation: *Low:* <300pmol/L *Ideal:* 300-500pmol/L *High:* >500pmol/L

Oestradiol (Oestrogen) is essential for fertile cervical fluid, egg maturation & implantation. Low E2 can lead to immature eggs or prevent implantation due to a thin endometrium. High E2 may indicate oestrogen dominance, fibroids or endometriosis.

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## Progesterone (Test “day 21” or 7 days before your next expected period) > 40 nmol/L suggests a strong ovulation

After a follicle has released its mature egg, the empty follicle becomes the ‘corpus luteum’, which continues to release progesterone in preparation for pregnancy. Enough progesterone is necessary for the development of the uterine lining and a viable pregnancy. This test will confirm if ovulation has happened and if the ovaries are producing enough progesterone to sustain a pregnancy.

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## Prolactin <400 mU/L

High prolactin inhibits FSH, leading to a decrease in the ovarian production of oestrogen and progesterone, which interferes with ovulation.

Test Day – Take it before 10am. Sit and relax 10 minutes before the test, as stress can increase prolactin levels.

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## Testosterone, Free Androgen Index (FAI) & Sex hormone binding globulin (SHBG) (Test any day)

Androgens tend to be elevated in women with PCOS.

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## DHEA

Is the building block to produce oestrogen and testosterone. It naturally declines with age and is often prescribed before IVF.

# THYROID HORMONES:



Thyroid abnormalities can lead to menstrual irregularities, such as luteal phase defect from low progesterone or ovulation issues. These can increase the risk of early pregnancy loss. When your 'thyroid' is tested, it is usually only TSH that has been tested. TSH comes from your brain and is testing your brain's communication with your thyroid. It is not testing your thyroid hormones per se. Testing your thyroid is so much more involved than that:

## TSH between 0.5-1.5 mIU/L

this is your brain's communication with your thyroid and regulates your thyroid hormones.

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## T4 16-18 pmol/L

one of your thyroid hormones we make in large quantities that needs to convert to active T3

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## T3 > 4.8 pmol/L

this is the ACTIVE thyroid hormone- the one that effectively does all the work, and tells us if T4 is converting properly. If it is too low, it is associated with a sluggish thyroid (hypothyroid).

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## Reverse T3 < 300

this is an inactive version of T3 and blocks its activity. High Reverse T3 is associated with extreme stress, fad diets or illness and sluggish thyroid (hypothyroid)

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## THYROID ANTIBODIES:

are indicators of autoimmunity. They are implicated in recurrent early pregnancy loss or difficulty conceiving.

- TPO 0.4–2.5 mIU/L thyroid peroxidase
  - TgAb < 4.5 IU/ml thyroglobulin
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# NUTRIENTS



## VITAMIN D

Higher than 100 nmol / L

Vitamin D acts more like a hormone than a vitamin. The active metabolite of vitamin D, 1,25-dihydroxyvitamin D, regulates steroid hormone production- adrenal (stress), thyroid and sex hormones. It supports uterine function, ovulation and embryo implantation. Vitamin D deficiency is associated with low Anti-Mullerian Hormone (AMH).

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## IRON STUDIES

It is not enough to only test ferritin.

Serum Iron: 12-22 umol/L

How much iron is in your blood, from food or recycled. Low levels indicate iron deficiency from insufficient iron containing food, poor absorption from gut issues, coeliac disease, heavy periods or internal bleeding. This is the iron waiting at the tram stop to get on the tram and travel home.

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Transferrin: Ideally 2.8 g/L

This is a transporter for iron, “the tram”, and it represents how hungry your body is for iron. A large tram (levels above 2.8 g/L) means your body wants more iron. A small tram (below 1.9 g/L) means your body has enough iron.

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Transferrin saturation: 30-35%

The amount of iron that gets on the tram, ready to be transported to the tissues. Less than 20% indicates iron deficiency, more than 50% suggest iron overload. High saturation (>40%) is an early indicator of HFE (haemochromatosis) mutation.

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Ferritin: 50-100 ug/L

This is the amount of iron that has travelled on the tram and made it home. It is iron storage in the liver, and low levels are associated with iron deficiency, whilst high levels iron excess.

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## PLUS

MCV: 88-92 fL

Mean corpuscular volume is the size of your red blood cells. Low < 88 fL may indicate small RBCs and low iron and/or B6. High > 92 fL may indicate large RBC's with low B12 and/or folate.

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Haemoglobin: 135-160 g/L

Iron, B6, B12, folate, copper, zinc and protein are needed to make Hb which carries oxygen around your body. Low Hb signals anaemia, not necessarily iron deficiency.

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CRP: < 1 mg/L

is an inflammatory marker. High CRP can indicate you do not need more iron, when transferrin is <1.9 g/L and ferritin is normal. The OCP increases CRP to 5-15 mg/L.

### RBC folate >30 nmol/L

Folate is required for RBC & haemoglobin production, healthy cell division & growth, DNA formation and iron utilisation. Low folate is associated with spina bifida and neural tube defects, elevated homocysteine and recurrent early pregnancy loss.

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### B12 > 500 pmol/L or active B12 > 100 pmol/L

B12 works in harmony with folate (see above). Most labs do not test the active form.

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### Magnesium > 0.85 mmol/L

### Plasma Zinc: 14 mmol/L

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## SUGAR REGULATION



Our cells rely on a steady and sufficient supply of glucose to function optimally. Glucose concentration in the blood is thus tightly and precisely controlled- insulin lowers blood sugar, whilst cortisol and glucagon raise blood sugar..

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### Fasting Blood Glucose: 4-4.8 mmol/L

High levels can show up in people with high stress, high carbohydrate/sugar diets. Your hormones are negatively affected by poor blood sugar control which may interfere with your periods, fertility and can make weight loss difficult. High levels >5.5 mmol/L are associated with insulin resistance, whilst >7 mmol/L may indicate diabetes.

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### Fasting Insulin: <8 mU/L

The pancreas secretes insulin in response to increases in blood sugar levels. Insulin is the main glucose regulator and is responsible for getting sugar out of your blood and into your cells for use and energy production. Levels >8 can indicate some difficulty processing sugar & possible insulin resistance, which can lead to diabetes. This is a common marker in PCOS. Insulin is also catabolic and makes weight loss difficult.

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### HbA1c: 4-5%

Glycosylated haemoglobin is a marker for how well your body regulates blood sugar over time. High levels indicate poor blood sugar control, whilst >9% may indicate diabetes.

# ADVANCED TESTING FOR FERTILITY



## COELIAC GENE

HLA-DQ2 and HLA-DQ8. Over 99% of people affected by coeliac disease have the HLA DQ2, HLA DQ8, or parts of these genes. CeD is more prevalent in women with “all-cause” infertility and “unexplained” infertility than that in general population (DOI: <https://doi.org/10.1097/MCG.0000000000000285>)

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## MTHFR (Test any day)

MTHFR genetic defects are associated with an increased risk of (in)fertility, recurrent early pregnancy loss, pre-eclampsia, postpartum depression. This indicates the appropriate type of vitamin B9 (folate) for you, beyond folic acid.

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## Homocysteine 7-9 mcmol/L

is an amino acid. Vitamin B12, vitamin B6, and folate regulate homocysteine and change it into other substances that your body needs. High levels of homocysteine may indicate you are lacking B6, folate & B12. Elevated homocysteine is implicated in heart disease, stroke, dementia & recurrent early pregnancy loss.

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## Anti-Mullerian Hormone (AMH) (Test day 2-3)

If the result is < 14 pmol/L it may indicate failing of the ovarian reserve and ovarian activity (it is NOT a direct marker of egg numbers). If it is > 30 pmol/L it may indicate PCOS.

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## Antral Follicle Count (AFC) Transvaginal Ultrasound (Test day 7)

This ultrasound is very accurate and counts the total number of immature eggs. Ideally, we want to see 6-12 follicles on each ovary.

## MATERNAL INFECTIOUS DISEASE SCREEN

A routine screen to prevent mother-to-child transmission of infection or other effects on the unborn baby. Unfortunately, these are often only conducted once pregnancy has occurred. I would prefer you to get this done at least 3 months prior to conception so that we can mitigate any issues.

The screen includes:

- HIV
- Syphilis
- Hepatitis B
- Rubella
- Hepatitis C

# ADVANCED TESTING FOR FERTILITY & IVF



## CLOTTING BLOOD TESTS

Blood-clotting disorders can impact fertility substantially. Excessive clotting is associated with recurrent early pregnancy loss and may increase the risk of slow foetal growth. Abnormal results may be associated with increased risk of placental blood clots, DVT (deep vein thrombosis) or pulmonary embolism. If you are experiencing recurrent early pregnancy loss, these tests may be worth investigation

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Protein S & C

Antiphospholipid syndrome

Anti-thrombin III

Factor V Leiden

Lupus Anticoagulant

Prothrombin II mutation

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## NATURAL KILLER CELLS

Terribly emotive name & controversial- some fertility experts think there is insufficient evidence to justify testing and / or treatment. I guess I feel no 'stone left unturned' when it comes to fertility. Natural Killer cells are part of our immune system that protect every organ of our body from infection (and cancer), including our uterus. Uterine NK cells (uNK) are needed in low amounts to protect the embryo & aid implantation. Elevated levels are associated with inflammation, difficulty conceiving and early pregnancy loss. Treatment may be considered experimental.

## DQ ALPHA GENE

DQa genes are also part of our immune system. There are different DQa genes e.g 1.02, 1.01, 05.05. If a couple shares a genetic match, they have identical proteins on their cells. The uterus fails to recognise the embryo as separate body, but a part of itself, that shouldn't be there. The immune system kicks in and uNK cells are produced in high quantities to eliminate the embryo, seen as a risk. It does not interfere with embryo quality. Rather, it prevents implantation, and causes recurrent early pregnancy loss.

## ERA, EMMA and ALICE

Tests used in IVF to give a complete overview of endometrial health. Slightly controversial

ERA (Endometrial Receptivity Analysis)

Enables a perfectly timed embryo transfer, when the endometrium is most receptive .

EMMA (Endometrial Microbiome Metagenomic Analysis)

Determines uterine microbiome suitability for implantation - detects pathogenic bacteria

ALICE (Analysis of Infectious Chronic Endometritis)

Detects pathogenic bacteria

# SPERM HEALTH MATTERS



This one is for the sperm providers! Again, I recommend a SEMEN ANALYSIS is conducted at least 3 months prior to conception as it takes 74 days to make sperm. Again the ranges I have included are the optimal ranges taht I would like to see, not the standard conventional reference ranges.

A standard semen analysis will include:

- Volume > 2 mL amount of ejaculate (the sperm are in the ejaculate)
- pH > 7.2
- Count > 80 million number of sperm per mL of ejaculate
- Total count > 200 million number of sperm per total ejaculate
- Morphology > 10 % is the size, shape and appearance of a sperm. Sperm can be misshapen based on the size of the head, having an extra head, no head or not tail!
- Overall motility > 80% sperm that are moving
- Progressive motility > 60% sperm that are swimming forward, propelling towards the egg

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## ADVANCED TESTING:

**A typical semen analysis does NOT include** anti-sperm antibodies or **DNA fragmentation!** It must be specifically requested on top of the semen analysis.

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### Anti-sperm antibodies

are immune system proteins that destroy sperm. Antisperm antibodies can be found in semen, blood, or vaginal fluids. They can impact sperm count, motility and sperm-egg interaction.

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### DNA fragmentation.

The only job of the sperm is to deliver its DNA to the egg. The DNA is in the head of the sperm and we want it to be excellent quality. But it can be broken. DNA fragmentation refers to the percentage of sperm with fragmented or broken DNA. The higher the DF the more sperm containing genetic damage.

- 0-15% = excellent
  - 15-20% = good
  - 20-25% = fair
  - > 25% = poor
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Research indicates sperm DNA damage is associated with early pregnancy loss. In one study on IVF patients, couples were significantly more likely to experience early pregnancy with higher levels of sperm DNA fragmentation. It was concluded "high sperm DNA fragmentation can compromise 'embryo viability,' resulting in pregnancy loss."  
<https://doi.org/10.1093/humrep/del251>

Another study also related higher DF with *early pregnancy loss*.  
<https://doi.org/10.1016/j.fertnstert.2007.06.018>

# MEDICAL DISCLAIMER:

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This publication is no substitute for medical consultation, diagnosis, treatment, examination, advice or treatment of existing conditions and it is recommended that you seek advice from your primary healthcare provider or medical professional before undertaking any recommendations from this publication.

The medical references ranges utilised in this publication may vary depending on different laboratories used. The ranges presented within this publication are based on non-pregnant adults.

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## DR. MIRANDA MYLES



# THANK YOU

FOR MORE INFORMATION ON HOW I CAN SUPPORT YOU  
THROUGH YOUR HEALTH JOURNEY OR TO BOOK AN  
APPOINTMENT WITH ME HEAD TO MY [WEBSITE HERE](#)

