

Test	Optimum Range		Your Results		Reference range	Unit of measure	Test information and meanings
	Min	Max	15/12/2023				
FBC/FBE/CBC - RED CELLS							
RCC (female)	3.9	4.5	4.59		3.6-5.2	x10 ¹² /L	Red Blood Cell count. Low levels suggest one of more nutrient deficiencies (B12, folate and protein) needed to make them, or blood loss or low thyroid function. High levels can be from dehydration if only a minor high , testosterone injections, or a Thalassaemia genetic condition especially if of Greek or Italian descent if consistently higher.
MCV	80	90	93.00		80-98	fL	Mean corpuscular volume (MCV) is a measurement of the average volume of RBCs. High levels indicate larger than normal (macrocytic) red cells, for example in anaemia caused by vitamin B12 or folate deficiency, liver disease, alcohol or drugs/medications.
MCHC	330	350	318.00		320-360	g/L	Mean Corpuscular Haemoglobin Concentration (MCHC), or the average amount of haemoglobin in a given volume of blood. This is a calculated result based on Haemoglobin and Haematocrit results. Low results indicate hypochromic red cells which suggests iron deficiency anaemia
FBC/FBE/CBC - WHITE CELLS	Min	Max	15/12/2023		Reference range	Unit	
WCC	5	7.5	12.00		4.0-11.0	x10 ⁹ /L	The white blood cell (WBC) count indicates the number of white blood cells in a given amount of blood. Raised levels are an indicator that a fight or immune response is occurring. Low levels (Leukopenia) are indicative of chronic inflammation or chronic infection , depressed immune system, bone marrow conditions, or nutrient deficiencies needed to make WBC (zinc, protein, B12 and folate) .
Neutrophils (%)	40	60	8.4			x10 ⁹ /L	A type of immune system WBC. Low levels are indicative of severe or chronic bacterial infections , or medication side effects, or autoimmune conditions, or low zinc .
Lymphocytes (%)	24	44	2.8		1.1-4.0	x10 ⁹ /L	There are 3 types of lymphocytes, called T-cells, B-cells & Natural Killer cells. T-cells develop in the thymus gland, and B-cells mature in the bone marrow. Both are important to immune function because they recognize antigens & bind to antigens. Natural killer cells have the ability to kill virus-infected cells or cancer cells. Low lymphocytes (Lymphocytopenia) can occur from chronic infections , autoimmune conditions, cancers, or cancer treatments, or nutrient deficiencies (zinc, protein, B12, folate, vitamin D) .

Platelets	200	400	447		150-450	x10 ⁹ /L	Can be low in chronic or post-viral infections, autoimmune conditions, medications and malignancies, or nutrient deficiencies in zinc, protein, vitamin B12 and/or folate.
INFLAMMATION	Min	Max	15/12/2023		Reference range	Unit	
CRP	1	4	10.00		0-6	mg/L	C-reactive protein (CRP) is the first evidence of inflammation or an infection . Concentration increases in the blood within a few hours after the start of infection or inflammatory injury. Inflammation is the response of the tissues to irritation or injury, characterised by pain, swelling, redness & heat. The severity, characteristics, & duration of the inflammation depend on the cause, the particular area of the body affected, & overall health. Level of CRP can increase many hundred-fold in response to inflammation, then drop quickly as soon as the inflammation passes.
IRON STUDIES	Min	Max	15/12/2023		Reference range	Unit	
TRANSFERRIN	2	3.6	30.00		1.9-3.1	g/L	Transferrin transports iron ions in the blood. High levels can indicate iron deficiency, hypothyroid, B12 deficiency - you have low B12 and low T4
	25	45			32-48	umol/L	
TRANSFERRIN SATURATION	28	35	22		15-50%	%	This result is a calculation dependent on serum iron and transferrin, not an actual measurement. 70% of iron is stored in RBC haemoglobin, the rest found as ferritin and haemosiderin. Iron is bound to transferrin proteins. High levels indicate haemolytic or other anaemias, or iron overload or poisoning, or increased absorption (as in haemochromatosis). Chronic illness can see a low serum iron, decreased TIBC and normal TS. Low levels indicate iron deficiency and anaemia. Symptoms include extreme tiredness, loss of stamina, pale skin, dizziness, irritability, headaches, weakness, hair loss , shortness of breath and heartbeat during exercise. Less common symptoms include abnormal cravings, brittle nails and restless leg syndrome. Women approaching menopause can have lower levels
FERRITIN (female)	50	100	132		20-290	ug/L	Ferritin is the best indicator of iron status, being the iron storage protein. Ferritin levels may rise in acute phase reactions such as infections, inflammation , cancer etc to give a false optimal or a high result.
VITAMIN B12 and FOLATE	Min	Max	15/12/2023		Reference range	Unit	
Vitamin B12 (serum)	600	1100	180		150 - 750	pmol/L	A deficiency in vitamin B12 can result in neuropathy- nerve damage that can cause tingling & numbness in the patient's hands & feet. Needed for cell formation & cellular replication, DNA synthesis, nerve function, and metabolism of fats and proteins. If low, symptoms of soreness of tongue, diarrhoea, depression, lethargy, shortness of breath, poor concentration & memory . B12 is found in animal products such as red meat, fish, poultry, milk and eggs.

CHOLESTEROL & LIPID PANEL	Min	Max	15/12/2023		Reference range	Unit	
TOTAL CHOLESTEROL	4.66	7	5.40		Below 4.0	mmol/L	Cholesterol is essential for life & forms the membranes for cells in all organs & tissues is needed for many hormones essential for development, growth & reproduction, & forms bile acids that are needed to absorb nutrients from food. Total Cholesterol comprises various lipoproteins such as HDL, which takes excess cholesterol away for disposal, LDL which takes cholesterol TO cells so they can use it , and other subtypes of lipoproteins. Only small amount of cholesterol comes from diet, and most is made in your liver. Required to maintain artery flexibility. Low levels are indicative of increased risk of degenerative diseases as fewer antioxidants available for scavenging free radicals. Cholesterol is needed to remove fat soluble toxins from the brain. Levels below 4.5 cannot manufacture any hormones.
TRIGLYCERIDES	0.79	1.24	1.50		Below 2.0	mmol/L	Triglycerides are the body's storage form of fat & indicates fats absorbed from the gut & fat stores. Most triglycerides are found in adipose (fat) tissue. Some triglycerides circulate in the blood to provide fuel for muscles. Extra triglycerides are found in the blood after eating a meal — when fat is being sent from the gut to storage. Ideally, the test for triglycerides should be done when you are fasting & no extra triglycerides from a recent meal are present. Very high in pancreatitis. High in under active thyroid , diabetes, kidney or pancreatic problems & seen in the use of OCP. If high when fasting, this indicates insulin resistance. Low in malabsorption, overactive thyroid & liver disease
HDL	1.42	5	1.30		Above 0.9	mmol/L	HDL is a type of lipoprotein that carries cholesterol in the blood. HDL test measures the amount of cholesterol carried by HDL (high density lipoprotein) particles. HDL particles remove excess cholesterol from the body. Hence, having a high level of cholesterol carried by HDL particles is good. Has antioxidant capacity for scavenging free radicals. HDL needed to remove fat soluble toxins from the brain. Low levels: the body is unable to carry cholesterol efficiently leading to fat stores and high triglycerides in the blood.
LDL	0.5	3.37	3.40		Below 2.0	mmol/L	LDL is a type of lipoprotein that carries cholesterol in the blood. LDL is considered undesirable because it increases risk of atherosclerosis & heart disease . LDL is termed 'bad' cholesterol, but this isn't entirely true as LDL is just carrying cholesterol TO cells so they can use it! The LDL result is a CALCULATED or estimated result, and not a true amount which the Total Cholesterol or HDL are. A high result is Indicative of high processed carbohydrates in the diet, which causes glycation and oxidation of the LDL. Increasing healthy fats will reduce LDL! Fasting (such as prior to blood tests) can increase LDL!
Triglyceride : HDL ratio. <0.8 (good) <1.8 (average) >1.8 (bad)	0	0.8	1.15				Should be done after fasting. This is a better marker of heart health than Total Cholesterol! You have an increased risk of cardiovascular disease
E/LFT (Biochemistry)	Min	Max	15/12/2023		Reference range	Unit	

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POTASSIUM	4	4.5	4.90		3.5-5.0	mmol/L	Potassium is needed for heart rhythm and contraction. Potassium removes fluid wastes from the cells & the body including buffering uric acid, reduces blood pressure, for muscle energy and nerves and for making stomach acid. High levels from cellular or tissue damage, severe dehydration , medications, adrenal insufficiency (low cortisol) or acidosis.
CREATININE	70.7	97.2	56.00		40-110	umol/L	Creatinine is produced in your muscles when muscle breaks down. Creatinine is used in body cells to produce the energy needed to contract muscles & produces creatinine at a fairly constant rate. Almost all creatinine is excreted by the kidneys, so blood levels are a good measure of health of your kidneys. A high result can cause a false high eGFR result. Low levels can indicate chronic kidney disease, reduced kidney function or malnutrition. Other possible causes can include low muscle mass, liver problems or illness.
BILIRUBIN	8.5	13.7	7.00		<25	umol/L	Bilirubin is a metabolic byproduct of haemoglobin breakdown from damaged or old red blood cells. Low levels can be caused by smoking, obesity and metabolic dysfunction. Studies have shown that lean people have higher levels of bilirubin than those who are overweight or obese as bilirubin directly affects the accumulation of fat and reduction of mitochondrial function (energy production). Metabolic syndrome is classified as high triglycerides, waist circumference of >35 inches in women, high HDL cholesterol and high fasting blood sugar levels. Low levels also reduce insulin sensitivity and glucose uptake into the cell (more glucose in the blood = high blood sugars). Plays a role in high inflammation when low.
THYROID PANEL	Min	Max	15/12/2023		Reference range	Unit	
TSH	1	2	0.64		.04-4.0	mU/L	Thyroid-stimulating hormone is made by the pituitary gland & is the stimulating hormone to the thyroid to make thyroid hormones T4 and T3. The thyroid gland is your major metabolic controller, managing the metabolic rate, or how fast you produce energy, or how fast or well all body systems and cells work! Higher TSH results result from and suggest a low functioning thyroid (ie hypothyroidism), and low functioning cells and body systems. This also contributes to weight gain, low moods and other low states. A low TSH causes hyper body states, such as anxiety, high energy production, weight loss and more, known as hyperthyroidism.
free T4 thyroxine (inactive)	14	18	11.00		10-20	pmol/L	T4 is one of two major hormones produced by the thyroid gland (the other is called triiodothyronine, or T3). Thyroid hormones help regulate the body's metabolism. Most T4 in blood is attached to a protein; less than 1% is unattached. The blood test measures the amount of free (unattached) T4 hormone in your blood since this is the biologically relevant fraction. Low T4 can indicate hypothyroidism.
FEMALE HORMONES	Min	Max	15/12/2023		Reference range	Unit	
OTHER TESTS	Min	Max	15/12/2023		Reference range	Unit	
Vitamin D	100	150	69		>50	nmol/L	Vitamin D is actually an anti-inflammatory hormone! Hence it reduces inflammation of chronic disease conditions. Having good levels is also a huge immune system booster!

HEALTH RISK FACTORS						
Anaemia Risk	Min	Max	15/12/2023			
Haemoglobin (female)	135	145	135.00	0.00		The more green vs. red results in this section indicate whether a low or high risk of anaemia issues, of which there are many types, depending on the deficiency (iron, B12, folate etc)
RBC (female)	3.9	4.5	4.59	#REF!		
Hct (female)	0.37	0.44		0.00		
MCH	28	32	29.40	0.00		
MCV	80	90	93.00	0.00		
Iron	8.96	17.91	13.00	0.00		
Ferritin (female)	50	100	132	0		
Total Protein	69	74	74	0		
Vitamin B12 (active)	128	150	0	0		
Vitamin B12 (serum)	600	1100	180	0		
Folate	36	42	0.00	0.00		
Thyroid Disease Risk	Min	Max	15/12/2023			
Cholesterol	4.66	7	5.40	0.00		The more green vs. red results in this section indicate whether a low or high risk of thyroid issues
Zinc	15	17	0.00	0.00		
Vitamin D	100	150	69	0		
Total Protein	69	74	74	0		
TSH	1	2	0.64	0.00		
T4	14	18	11.00	0.00		
T3	5	6	0.00	0.00		
Reverse T3 (rT3)	100	300	0.00	0.00		
Anti-thyroglobulin antibodies	0	30	0	0		
Anti-thyroid Peroxidase (TPO) antibodies	0	30	0	0		
TSH Immunoglobulin	0	0.55	0.00	0.00		
LD/LDH	140	200	0	0		

Oxidative Stress	Min	Max	15/12/2023			
Total Bilirubin	8.5	13.7	7.00	0.00		The more green vs. red results in this section indicate whether a low or high risk of oxidative stress (or "free radical") damage to cells
Ferritin (female)	50	100	132	0		
Haemoglobin (female)	135	145	135	0		
MCH	28	32	29	0		
MCV	80	90	93	0		
Cholesterol	4.66	7	5.40	0.00		
LDL	0.5	3.37	3.40	0.00		
Triglycerides	0.79	1.24	1.50	0.00		
Eosinophils %	0	2	1	0		
Chloride	100	106	102	0		
Sodium	135	142	138	0		
Homocysteine	6	9	0.00	0.00		
Uric acid (urate)	0.2	0.32	0.000	0.000		
Unbound copper	1	15	0.00	0.00		
Heart Disease Risk	Min	Max	15/12/2023			
Triglycerides	0.79	1.24	1.50	0.00		The more green vs. red results in this section indicate whether a low or high risk of heart related issues
Triglyceride : HDL	0	0.8	1.15			
Albumin	40	50	46	0		
eGFR	90	100	90	0		
Homocysteine	6	9	0.00	0.00		
Immune System Strength/Risk	Min	Max	15/12/2023			
TSH	1	2	0.64	0.00		The more green vs. red results in this section indicate whether a low or high risk of immune system issues
Vitamin D	100	150	69	0		
WCC	5	7.5	12.00	0.00		
Zinc (plasma)	15	17		0.00		
Zinc (serum)	15	17		0.00		

CRP	1	4	10.0	0.0		
ESR (female)	0	20	2.00	0.00		
Stomach Function	Min	Max	15/12/2023			
Zinc (serum)	15	17		0.0		These test results summarise stomach function, as iron levels, B12, folate and proteins are dependent on good stomach acid and enzyme production. Low results here can indicate low stomach production and function.
Vitamin B12 (active)	128	150		0		
Vitamin B12 (serum)	600	1100	180	0		
Folate (Serum)	36	42		0.00		
Total Protein	69	74	74.00	0.00		
Transferrin Sat %	28	35	22.00	0.00		
Energy	Min	Max	15/12/2023			
TSH	1	2	0.64	0.00		These results summarise the tests relevant to energy production, with the relevant nutrients or organ functions needed for energy. Low results here (or high TSH) indicates low energy production. High Transferrin Saturation or low TSH can also contribute to low energy.
Cholesterol	4.66	7	5.40	0.00		
Vitamin B12 (active)	128	150	0	0		
Vitamin B12 (serum)	600	1100	180	0		
Folate	36	42	0.00	0.00		
Haemoglobin (female)	135	145	135.00	0.00		
Transferrin Sat %	28	35	22.00	0.00		
Phosphate	1.2	1.4	0.00	0.00		
Mental Health	Min	Max	15/12/2023			
TSH	1	2	0.64	0.00		These results summarise the tests relevant to having good mental health balance, with the relevant nutrients or organ functions needed for neurotransmitter production and balance. Low results here (or a high TSH) would indicate a low production of neurotransmitters and therefore possible poor mental health symptoms. Some high results (ie, folate) or very low TSH could still result in poor mental health symptoms.
Cholesterol	4.66	7	5.40	0.00		
Vitamin B12 (active)	128	150	0	0		
Vitamin B12 (serum)	600	1100	180	0		
Folate	36	42	0.00	0.00		
Zinc (serum)	15	17	0.00	0.00		
Vitamin D	100	150	69.00	0.00		

Treatment Objectives

The results of the pathology tests shows some issues require treatment. The following are the priority for treatment:

- 1 anaemia - Improve production of RBC, increased nutrients
- 2 Improve thyroid function
- 3 Improve adrenal function
- 4 Improve stomach function (improve stomach acid and enzymes)
- 5 Improve immune system function (for possible chronic infection)
- 6 Reduce inflammation.
- 7

Further pathology tests may be required:

- 1 MTHFR - to check suspected effects of this genetic defect on high folate levels, poor detoxing, poor thyroid and other symptoms
- 2