

Client Pathology Results									
Practitioner: Hartmut Günther B.Sc. Hons Biochem, Grad. Cert. Nutritional Medicine, Ph: 0439 54 7788, Email: hart@hopeville.com.au					KEY Results in Blue				
Treating Doctor: Dr D					Results that are between 1 and 2 standard deviations above or below normal/mean are shown as h or l respectively				
Note that the interpretation of these results focuses more on optimal health, prevention of disease and correcting any potential nutritional insufficiencies or imbalances and as such defines an optimal range as usually -0.5 to +0.5 Standard Deviations, while for hormones, the Optimal Range is 0 to +1SD and for antibodies is usually < -1SD .					Results that are at least 2 standard deviations above or below normal/mean are shown as H or L respectively. T-score show these stand-deviation values and (red) indicates a negative value				
Lab used for latest results >>		S&N	S&N						
Patient Code: JS		Age at last LabTest: 57		Female					
Pathology Test	Previous 2008	Nov 2008 - Feb 2009	Low	High	Mean	SD	T-score	Nutritional and Metabolic Indications and notes	
Full Blood Picture									
Haemoglobin (Hb)	Always Lowish	125.00 l	115.00	165.00	140.00	12.50	(1.20)	Low Hb in normocytic still consider possible B12 and Folate and Fe, Zn, B6 & or protein deficiency. Hb< -2 SD needs invest.	
Haematocrit (Hct)		0.40	0.33	0.46	0.40	0.03	0.15		
Red Cell Count		4.40	3.60	5.20	4.40	0.40	0.00		
MCV		89.00	80.00	98.00	89.00	4.50	0.00		
Mean Cell Hb		28.41 l	27.00	35.00	31.00	2.00	(1.30)		
Total WCC (total white cells or leukocyte blood count)	11.0 to 16.0 H	7.10	4.00	11.00	7.50	1.75	(0.23)		
Neutrophils	6.4 - 14.6 H	3.49	2.00	7.50	4.75	1.38	(0.92)	Could be a low count raised by inflammation so check decreased protein, Zn & Vit C	
Lymphocytes	1.1 - 4.2 H	2.94	0.80	4.00	2.40	0.80	0.67	Could be a low count raised by Immune activation so check for decreased B6, Zn & protein	
Monocytes		0.51	0.00	0.90	0.45	0.23	0.27		
Eosinophils		0.10 l	0.00	0.60	0.30	0.15	(1.33)	Can indicate increased adrenosteroid production	
Basophils		0.03 l	0.00	0.15	0.08	0.04	(1.20)	Histapenia - possible decreased B3,B12 & folate. Other decreasing factors include possible acute allergic reaction, hyperthyroidism and stress reactions.	
Platelet		290.00	150.00	400.00	275.00	62.50	0.24		
CRP	1.00	2.00 l	0.00	10.00	5.00	2.50	(1.20)	Low Vit E, EFA imbalance	
ESR	38.00 H	24.00 h	1.00	30.00	15.50	7.25	1.17	Low Vit E, EFA imbalance	
Biochemical analysis									
Blood Sodium		141.00	137.00	147.00	142.00	2.50	(0.40)	See Indications for more details especially in out of range cases	
Blood potassium		4.10	3.50	5.00	4.25	0.38	(0.40)	See Indications for more details especially in out of range cases	
Chloride		106.00 h	96.00	109.00	102.50	3.25	1.08		
Bicarb		27.00	25.00	33.00	29.00	2.00	(1.00)		
Na/K ratio		34.39	30.00	36.00	33.00	1.50	0.93		
Urea		5.10	3.50	7.50	5.50	1.00	(0.40)		
Creatinine		72.00	40.00	120.00	80.00	20.00	(0.40)		
urea/creatinine ratio		70.83 l	70.00	90.00	80.00	5.00	(1.83)		
Urate		0.24	0.15	0.40	0.28	0.06	(0.56)		
Total Protein		70.00	60.00	82.00	71.00	5.50	(0.18)		

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S Albumin		41.00	35.00	50.00	42.50	3.75	(0.40)	Indicates impaired protein synthesis - check possible lack of B6 and Zinc, low hormone status or cytokine-induced metabolic derangement	
Protein Metab Index (PMI)		2.41 L	2.50	3.50	3.00	0.25	(2.35)	Excessive protein tissue breakdown, synthesis impaired	
Globulins		29.00	20.00	40.00	30.00	5.00	(0.20)		
Glucose		5.00	3.00	7.70	5.35	1.18	(0.30)		
Liver Function Tests (LFT's)									
Bilirubin-total (TBIL)		12.00	2.00	20.00	11.00	4.50	0.22		
Bilirubin-conjugated (Direct)		3.00	0.00	8.00	4.00	2.00	(0.50)		
Alkaline phosphatase (ALP)		48.00 I	30.00	115.00	72.50	21.25	(1.15)	Low level of Al Phos reportedly indicates lack of zinc	
LDH or LD (Lactate dehydrogenase)	214 to 365 H	249.00 h	80.00	250.00	165.00	42.50	1.98	Lactate dehydrogenase (LDH or LD) is an enzyme found in many body tissues, including the liver. Elevated levels of LDH may indicate liver damage.	
AST (Aspartate transaminase)		24.00	0.00	41.00	20.50	10.25	0.34		
ALT (Alanine transaminase)		24.00	0.00	45.00	22.50	11.25	0.13		
GGT(Gamma glutamyl transpeptidase)		16.00	0.00	45.00	22.50	11.25	(0.58)	Possible Lack of Vit B6	
Kidney									
eGFR (Estimated Glomerular filtration rate)		73.00	60.00	100.00	80.00	10.00	(0.70)	Glomerular filtration rate (GFR) describes the flow rate of filtered fluid through the kidney and values below 89, especially if falling over time, need to be monitored and other tests performed to asses kidney function.	
Blood Lipids									
Cholesterol-total	5.6 - 7.0 H	6.50 H	3.90	5.50	4.70	0.40	4.50	Lower risk for vascular disease. Many drugs can increase cholesterol including corticosteroids, anabolic steroids and Vitamin D - check Mosby's lab test reference. Excessive exercise can raise HDL and Familial HDL lipoproteinemia.	
Triglycerides (random)	1.00	0.90 I	0.60	2.00	1.30	0.35	(1.14)		
HDL Cholesterol	2.0 - 2.8 H	2.00 H	1.00	1.90	1.45	0.23	2.44		
LDL Cholesterol	2.3 - 4.4 H	4.10 H	0.00	4.00	2.00	1.00	2.10	Can be high in Familial LDL lipoproteinemia and Familial hypercholesterolemia Type IIa. The most common genetic defects in FH are LDLR mutations (prevalence 1 in 500, depending on the population), ApoB mutations (prevalence 1 in 1000), PCSK9 mutations (less than 1 in 2500) and LDLRAP1. TEST FOR THESE if suspect Familial hypercholesterolemia. Also can be raised in chronic liver disease, hypothyroidism, alcohol consumption, Cushing's syndrome.	
Total-C/HDL ratio	2.0 - 3.5	3.25	2.50	5.00	3.75	0.63	(0.80)	Note that this client has been on LIPITOR	
Homocysteine	5.20	9.90 h	5.00	10.00	7.50	1.25	1.92	Optimal is below 9mM/l and normal is below 15mM/l. Elevated homocysteine associated with increased cardio vascular risk, especially if blood lipids are also increased - indicating an increased need for folic acid, Vit B6, Vit B12 and VitC	
Apolipoproteins									
Genetic tests									
Vitamin D, PTH and Calcium									
25 OH-Vit D3	41 to 145 L	88.00 I	50.00	300.00	175.00	62.50	(1.39)		
VitD 1,25OH/VitD 25OH Ratio		0.00	1.00	2.00	1.50	0.25	0.00		
Calcium (corrected)	2.13 to 2.28	2.24	2.10	2.60	2.35	0.13	(0.88)		
Phosphate		1.30	0.80	1.50	1.15	0.18	0.86		

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Cal/Phos ratio	0.7 to 1.1	1.72: L	2.0	2.5	2.3	0.13	(4.22)	May indicate calcium lack		
S Albumin		41.00	35.00	50.00	42.50	3.75	(0.40)			
Haematopoiesis										
Serum iron	9.0 to 11	7.00	7.0	27.0	17.00	5.00	(2.00)	Optimal is 10-25 and Ferritin optimal is 50-150. A low serum iron may indicate low absorption or dietary lack of iron. Best however to view serum iron in relation to ferritin and transferrin saturation levels. The serum iron level is a measurement of the quantity of iron bound to transferrin. Look for microcytic RBC's. A low serum iron, elevated TIBC and low transferrin saturation is characteristic of iron deficiency anemia.		
Serum Ferritin	30.0 to 43.0	36.00	30.0	150.0	90.00	30.00	(1.80)	Ferritin is the major iron storage protein and levels thus reflect iron stores in the body and levels below 10ug/l are diagnostic of iron deficiency anemia. Ferritin can be decreased also by severe protein depletion via malnutrition. Pregnancy decreases ferritin levels. False positives can be seen in chronic disease states. As ferritin is an "acute phase protein" it may also be elevated in conditions that DONT reflect iron stores such as infections and acute inflammatory diseases and metastatic cancer and lymphoma, collagen diseases, alcoholism and chronic liver diseases. Elevations of ferritin are seen around 1-6 days after onset of acute illness and as such may MASK iron deficiency.		
Transferrin Saturation %	13.0 to 17.0	11.00: L	20.0	55.0	37.50	8.75	(3.03)	Tranferrin saturation reflects the % of transferrin and other mobile iron binding proteins saturated with iron and values less than 15% is indicative of iron deficiency anemia.		
TIBC	65 to 68	62.00	45.0	72.0	58.50	6.75	0.52	Total iron binding capacity (TIBC) is an indirect yet accurate measurement of transferrin as tranferrin represents the largest quantity of iron binding proteins (excluding ferritin). In 70% of patients with iron deficiency TIBC is increased. As transferrin is a "negative acute phase protein", leves can be reduced in acute inflammatory reactions and in some chronic illnesses and hypoproteinemia. Pregnancy and estrogen therapy can increase TIBC while iron intake does NOT usually affect TIBC levels.		
Serum B12	213 - 470	320.00	162.0	811.0	486.50	162.25	(1.03)			
R/C Folate	1299.00	1299.00	545.0	3370.0	1957.50	706.25	(0.93)			
Thyroid Function										
Thyroid Perox Ab		1.00	0.00	12.00	6.0	3.00	(1.67)	Less than 6 is Ref Range		
Thyroglobulin Ab	28.00	1.00	0.00	34.00	17.0	8.50	(1.88)	Less than 4 is Ref Range		
Cardiac Markers										
Metabolic activity										
Mineral balance										
Immune and Autoimmune activity										
Anti Nuclear Antibodies (ANA)		Negative						Optimal Range for antibodies is usually < -1SD A negative result rules out SLE		
Classical- ANCA (C-ANCA)		Negative						Less than 10 is negative while greater than 2560 is strongly positive. Note that a Negative value does not rule out a large vessel or medium vessel vasculitis.		
Perinuclear - ANCA (P-ANCA)		Negative						Less than 10 is negative while greater than 2560 is strongly positive. Note that a Negative value does not rule out a large vessel or medium vessel vasculitis.		

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IgG TOTAL	6.72	6.72	5.76	15.36	10.56	2.40	(1.60)	Hypoproteinemia, drug immunosuppression, amongst others		
IgA TOTAL	1.03 to 1.32	1.66	1.24	4.16	2.70	0.73	(1.42)	Low values can reflect protein losing enteropathies, Ataxia/telangiectasia, immunosuppressive drugs, congenital isolated deficiency		
IgM TOTAL	1.56	1.56	0.48	3.10	1.79	0.66	(0.35)			
IgE TOTAL		18.00	10.00	100.00	55.00	22.50	(1.64)	less than 100kIU/l is in range		
Allergy Testing										
RAST (allergy test) IgE - pigeon feathers		Undetectable								
Immulate Allergy test		Bird mix, Pideon droppings and Aspergillus fumigatus were negative						Note that a Negative RAST does not always exclude clinical allergy		
Aspergillus IHA(precipitins) antibody test		Less than 160 indicating no significant specific aspergillus antibodies detected.								
Coeliac Disease Testing										
Tissue Transglutaminase IgA antibodies (tTG IgA)		0.50	0.00	6.00	3.00	1.50	(1.67)			
IgG antigliadin		4.00	0.00	20.00	10.00	5.00	(1.20)			
IgA antigliadin		8.00	0.00	20.00	10.00	5.00	(0.40)			
Other Tests										
Respiratory Tract Investigations										
M/C/S Sputum analysis		Following culture 2 organisms found: 1/ pseudomonas aearuginosa 2/ unidentified fungus								
Sputum Microscopy		No acid fast bacilli seen								
Glucose regulation		NM								
Steroid Hormones		NM						the Optimum Range is 0 to +1SD and		
Functional Liver Detoxification Profile		NM								
Essential Fatty Acids		NM								
Lactulose Breath Hydrogen Test		NM								