LABORATORY REPORT

Redcliffe labs

Patient NAME :			
DOB/Age/Gender :		Report STATUS :	
Patient ID / UHID :		Barcode NO :	
Referred BY :		Sample Type :	
Sample Collected :		Report Date :	

NABL-M(EL)T-03094 MEDICAL ENTRY LEVEL TESTING LABORATORY RECOGNITION PROGRAM

Nutritional Insights Complete Care Package

Complete Blood Count (CBC)

Test Description	Value(s)	Unit(s)	Reference Range
RBC Parameters			
Hemoglobin *colorimetric*	**11.7 L***	g/dL	12.0 - 15.0
RBC Count *Electrical impedance*	3.96	10^6/µl	3.8 - 4.8
PCV *Calculated*	36.7	%	36 - 46
MCV *Calculated*	92.68	fl	83 - 101
MCH *Calculated*	29.55	pg	27 - 32
MCHC *Calculated*	31.88	g/dL	31.5 - 34.5
RDW (CV) * *Calculated*	12.9	%	11.6 - 14.0
RDW-SD * *Calculated*	**44.9 H***	fl	35.1 - 43.9
WBC Parameters			
TLC *Electrical impedance and microscopy*	5.52	10^3/µl	4 - 10
Differential Leucocyte Count			
Neutrophils	56	%	40-80
Lymphocytes	35	%	20-40
Monocytes	6	%	2-10
Eosinophils	3	%	1-6
Basophils	0	%	<2
Absolute Leukocyte Counts ***Calculated***			
Neutrophils. *	3.09	10^3/µl	2 - 7
Lymphocytes. *	1.93	10^3/µl	1 - 3
Monocytes. *	0.33	10^3/µl	0.2 - 1.0
Eosinophils. *	0.17	10^3/µl	0.02 - 0.5
Basophils. *	**0**	10^3/µl	0.02 - 0.5
Platelet Parameters			
Platelet Count *Electrical impedance and microscopy*	292	10^3/µl	150 - 410
Mean Platelet Volume (MPV) * *Calculated*	11.5	fL	9.3 - 12.1
PCT * *Calculated*	**3.36 H***	%	0.17 - 0.32

Note :- (H* - High , L* - Low ,CL* - Critical Low,CH* - Critical High)

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Test Description	Value(s)	Unit(s)	Reference Range
PDW * *Calculated*	16.3	fL	8.3 - 25.0
Mentzer Index * *Calculated*	23.4	%	> 13

Interpretation:
CBC provides information about red cells, white cells and platelets. Results are useful in the diagnosis of anemia, infections, leukemias, clotting disorders and many other medical conditions.

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Liver Function Test (LFT)

Test Description	Value(s)	Unit(s)	Reference Range
Bilirubin Total *Diazo*	0.3	mg/dL	0.2 - 1.2
Bilirubin Direct *Diazo Reaction*	0.2	mg/dL	0.0 - 0.5
Bilirubin Indirect * *Calculation (T Bil - D Bil)*	0.1	mg/dL	0.1 - 1.0
SGOT/AST *IFFC WITH P5P*	24.2	U/L	5 - 34
SGPT/ALT *IFFC WITH P5P*	19.8	U/L	0 to 55
SGOT/SGPT Ratio *	1.22	-	-
Alkaline Phosphatase *IFFC with P5P*	62.9	U/L	40 - 150
Total Protein *Biuret*	6.7	g/dL	6.4 - 8.3
Albumin *BCG*	**3.7 L***	gm/dL	3.8 - 5.0
Globulin * *Calculation (T.P - Albumin)*	3	g/dL	2.3 - 3.5
Albumin :Globulin Ratio * *Calculation (Albumin/Globulin)*	1.23	-	1.0 - 2.1
Gamma Glutamyl Transferase (GGT) * *Photometric*	11.7	U/L	9 to 36

Interpretation:
The liver filters blood, metabolizes nutrients, detoxifies harmful substances, and produces blood clotting proteins. Liver cells contain enzymes that facilitate these functions. When cells are damaged, enzymes leak into the blood, detectable through blood tests.

Key enzymes tested:

1. **AST (SGOT):** may indicate tissue injury / damage in muscles or liver.
2. **ALT (SGPT):** Primarily in the liver. Elevated ALT and AST suggest liver damage.
3. **Alkaline Phosphatase & GGT:** Linked to bile production and flow. Elevated levels may indicate bile flow issues related to the liver, gallbladder, or bile ducts.

Blood proteins, **albumin and globulin**, are essential for growth, development, and health.

1. **Low protein:** May indicate bleeding, liver disorders, malnutrition, or agammaglobulinemia.
2. **High protein (Hyperproteinemia):** Often due to dehydration or increased protein production.
3. **Low albumin:** Caused by poor diet, kidney, or liver disease.
4. **High albumin:** Usually due to severe dehydration.

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Test Description	Value(s)	Unit(s)	Reference Range
Calcium, Serum			
Calcium Serum *BAPTA*	8.6	mg/dL	8.4 - 10.2

Interpretation:
Elevated calcium value are associated with hyperparathyrodism, multiple myeloma, neoplasms of bone and parathyroid & conditions of rapid demineralization, tetany & occasionally with nephrosis & pancreatitis. Severe nephritis & uremia may cause either elevated or lowered calcium values. Decreased values of calcium are noted in hypoparathyroidism, vitamin D deficiency, renal insufficiency, hypoproteinemia, malabsorption syndrome, severe pancreatitis with pancreatic necrosis and pseudo-hypoparathyroidism.

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Test Description	Value(s)	Unit(s)	Reference Range
Iron Studies			
Iron *Ferene*	117	µg/dL	50 - 170
TIBC,(Total Iron Binding Capacity) *Calculated*	267	µg/dL	250 - 450
UIBC *Ferene*	150	µg/dL	70 - 310
Transferrin Saturation *Method :Derived from IRON and TIBC values*	43.82	%	-

Interpretation:
Increased levels due to iron ingestion or ineffective erythropoiesis.Decreased levels due to infection, inflammation, malignancy, menstruation and Fe deficiency.Needs to be taken into consideration with TIBC. Transferrin Saturation:- Low level Transferrin Saturation can indicate iron deficiency, erythropoiesis, infection, or inflammation. High level Transferrin Saturation can indicate recent ingestion of dietary iron,ineffective erythropoiesis,haemochromatosis or liver disease.High TIBC, UIBC, or transferrin usually indicates iron deficiency, but they are also increased in pregnancy and with the use of oral contraceptives. Low TIBC, UIBC, or transferrin may occur if someone has:Hemochromatosis, Certain types of anemia due to accumulated iron,Malnutrition,kidney disease that causes a loss of protein in urine.

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Test Description	Value(s)	Unit(s)	Reference Range
Ferritin			
Ferritin	86.1	ng/mL	Men (20Y-60Y) : 30-400 ng/mL Women(17Y-60Y) : 13-150 ng/mL

Interpretation:
Note:
Increase in serum ferritin due to inflammatory conditions (Acute phase response) can mask a diagnostically low result

Comments
Serum ferritin appears to be in equilibrium with tissue ferritin and is a good indicator of storage iron in normal subjects and in most disorders. In patients with some hepatocellular diseases, malignancies and inflammatory diseases, serum ferritin is a disproportionately high estimate of storage iron because serum ferritin is an acute phase reactant. In such disorders iron deficiency anemia may exist with a normal serum ferritin concentration. In the presence of inflammation, persons with low serum ferritin are likely to respond to iron therapy.

Increased Levels
1. Iron overload - Hemochromatosis, Thalassemia & Sideroblastic anemia
2. Malignant conditions - Acute myeloblastic & Lymphoblastic leukemia, Hodgkin's disease & Breast carcinoma
3. Inflammatory diseases - Pulmonary infections, Osteomyelitis, Chronic UTI, Rheumatoid arthritis, SLE, burns · Acute & Chronic hepatocellular disease

Decreased Levels
Iron deficiency anemia

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Test Description	Value(s)	Unit(s)	Reference Range
Vitamin B12 / Cyanocobalamin			
Vitamin - B12 *CMIA*	625	pg/mL	187 - 883

Interpretation:
Low Values are a sign of a vitamin B12 deficiency. People with this deficiency are likely to have or develop symptoms.
Causes of vitamin B12 deficiency include:Not enough vitamin B12 in diet (rare except with a strict vegetarian diet), Diseases that cause malabsorption (for example, celiac disease and Crohn's disease), Lack of intrinsic factor, Above normal heat production (for example, with hyperthyroidism), Pregnancy. Increased vitamin B12 levels are uncommon. Usually excess vitamin B12 is removed in the urine. Conditions that can increase B12 levels include: Liver disease (such as cirrhosis or hepatitis), Myeloproliferative disorders (for example, polycythemia vera and chronic myelocytic leukemia).
Vitamin B12: Low Levels can cause malabsorption, Lack of intrinsic factor, Above normal heat production (for example, with hyperthyroidism), Pregnancy.High Level Liver disease, Myeloproliferative disorders (for example, polycythemia vera and chronic myelocytic leukemia).
1. Out of 140 healthy indian population, 91% of Vitamin B 12 concentrations was at lower level: 59.00 pg/ml and upper level: 700.00 pg/ml

"Patients on Biotin supplement may have interference in some immunoassays. Ref: Arch Pathol Lab Med—Vol 141, November 2017. With individuals taking high dose Biotin (more than 5 mg per day) supplements, at least 8-hour wait time before blood draw is recommended."

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Test Description	Value(s)	Unit(s)	Reference Range
Vitamin D 25 Hydroxy			
Vitamin D 25 - Hydroxy *CMIA*	33.6	ng/mL	Deficiency : <30 ng/mL

Interpretation:
25-Hydroxy vitamin D represents the main body reservoir and transport form. Mild to moderate deficiency is associated with Osteoporosis / Secondary Hyperparathyroidism while severe deficiency causes Rickets in children and Osteomalacia in adults. Prevalence of Vitamin D deficiency is approximately >50% specially in the elderly. This assay is useful for diagnosis of vitamin D deficiency and Hypervitaminosis D. It is also used for differential diagnosis of causes of Rickets & Osteomalacia and for monitoring Vitamin D replacement therapy.

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Test Description	Value(s)	Unit(s)	Reference Range

Magnesium

Magnesium,Serum *Enzymatic*	2.01	mg/dL	1.6 - 2.6

Interpretation:

Age	Ref Range in mg/dL
Newborn, 2 to 4 days	1.5 to 2.2
5 months to 6 years	1.7 to 2.3
6 to 12 years	1.7 to 2.1
12 to 20 years	1.7 to 2.2
Adult	1.6 to 2.6

Moderate or severe magnesium deficiency is usually due to losses of magnesium from gastrointestinal tract or kidneys as in vomiting and diarrhoea in former and alcohol, diabetes mellitus (osmotic diuresis), loop diuretics(furosemide) and aminoglycoside antibiotics in latter. Symptomatic hypermagnesemia is almost always caused by excessive intake with concomitant renal failure, thereby decreasing the ability of the kidneys to excrete excess magnesium.

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Test Description	Value(s)	Unit(s)	Reference Range
Phosphorus			
Phosphorus *Molybdate UV*	4.0	mg/dL	2.3 - 4.7

Interpretation:
Increased levels are found in acute mycocardial infarction (AMI), AMI with congestive heart failure, cirrhosis, obstructive jaundice, hemolytic anemia, various malignancies, skeletal muscle injury, electric and thermal burns.

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Test Description	Value(s)	Unit(s)	Reference Range

Folic Acid / Folate (Vitamin B9)

Folate (Folic Acid) * *CMIA*	9.6	ng/mL	3.1 - 20.5

Interpretation:

Note

1. Drugs like Methotrexate & Leucovorin interfere with folate measurement
2. To differentiate vitamin B12 & folate deficiency, measurement of Methyl malonic acid in urine & serum Homocysteine level is suggested
3. Risk of toxicity from folic acid is low as it is a water soluble vitamin regularly excreted in urine

Comments

Folate plays an important role in the synthesis of purine & pyrimidines in the body and is important for the maturation of erythrocytes. It is widely available from plants and to a lesser extent organ meats, but more than half the folate content of food is lost during cooking. Folate deficiency is commonly prevalent in alcoholic liver disease, pregnancy and the elderly. It may result from poor intestinal absorption, nutrition deficiency, excessive demand as in pregnancy or in malignancy and in response to certain drugs like Methotrexate & anticonvulsants.

Decreased Levels

Megaloblastic anemia, Infantile hyperthyroidism, Alcoholism, Malnutrition, Scurvy, Liver disease, B12 deficiency, dietary amino acid excess, adult Celiac disease, Tropical Sprue, Crohn's disease, Hemolytic anemias, Carcinomas, Myelofibrosis, vitamin B6 deficiency, pregnancy, Whipple's disease, extensive intestinal resection and severe exfoliative dermatitis.

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Test Description	Value(s)	Unit(s)	Reference Range
Electrolytes (Na/K/Cl)			
Sodium *Iron selective electrode Indirect*	138.4	mmol/L	136 - 145
Potassium *Iron selective electrode Indirect*	4.7	mmol/L	3.5 - 5.1
Chloride *Potentiometric*	105.8	mmol/L	98 - 107

Interpretation:
An electrolyte panel, which typically includes measurements of sodium (Na), potassium (K), and chloride (Cl) levels, is a common blood test that provides information about your body's electrolyte balance.

1. Sodium (Na):
1. Sodium is crucial in maintaining fluid balance in your body and is essential for nerve function and muscle contraction.
2. High sodium levels (hypernatremia) or low sodium levels (hyponatremia) can indicate various health conditions, including dehydration, kidney problems, or hormonal imbalances.

2. Potassium (K):
1. Potassium is vital for proper muscle function, including the heart muscle and nerve function, as well as maintaining fluid and electrolyte balance.
2. Abnormal potassium levels (hyperkalemia or hypokalemia) can indicate kidney dysfunction, dehydration, certain medications, or other underlying health issues.

3. Chloride (Cl):
1. Chloride works closely with sodium and potassium to maintain fluid balance and proper pH levels in the body.
2. Abnormal chloride levels may occur alongside imbalances in sodium and potassium and can indicate dehydration, kidney problems, respiratory issues, or metabolic disorders.

Healthcare providers typically order an electrolyte panel to evaluate and monitor electrolyte imbalances, diagnose certain medical conditions, assess kidney function, or monitor treatment effectiveness. It's usually part of routine blood testing, especially in cases of dehydration, kidney disease, heart conditions, or electrolyte disorders.

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Zinc, Serum

Zinc *Br-PAPS*	62.2	µg/dL	46 - 150

Interpretation:

Zinc Interpretation	Associated conditions
Zinc is vital trace element required for normal healing of wounds and normal immune function. Zinc levels lowered with systemic infections & inflammatory disorders,oral contraceptives,and pregnancy.	Zinc deficiency - Symptoms include depressed growth, teratogenesis, poor carbohydrate metabolism, altered Cognition, poor immune function, alopecia,impotence,eye and skin lesions,and diarrhoea.
Zinc exposure can occur from-Occupational exposure related to mining and metallurgic industries. Use of commercial products containing zinc(e.g. Zinc containing shampoos,Multivitamins)	Zinc excess is not of major clinical concern, however elevated zinc concentrations may interfere with copper absorption.

1. Whole Blood / Serum metal testing is used for the detection of recent exposure or poisoning with the toxic element. However, blood metal levels in healthy subjects can vary considerably with exposure to the particular metal present in the diet and in the environment.
2. It should be noted that low or within acceptable levels in blood / Serum do not always exclude that the element is uninvolved in contributing to the patient's symptoms because certain elements may be sequestered in tissues.
3. Lower metal levels in patients on follow-up imply that the toxic element exposure is reduced in the patient's immediate environment or that the body has efficiently eliminated the toxic element.

Reference –

1. Sample collection guidelines for trace elements in blood and urine. International union of pure and applied chemistry clinical chemistry division commission on toxicology working party. Pure & Appl. Chem., Vol. 67, Nos 8/9, pp. 1575-1608, 1995.
2. Nutrient & toxic elements interpretative guide, metamatrix, USA, 2011.

*** End Of Report ***

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2. It is to be presumed that the tests performed pertain to the specimen/sample attributed to the Customer's name or identification. It is presumed that the verification particulars have been cleared out by the customer or his/her representation at the point of generation of said specimen / sample. It is hereby clarified that the reports furnished are restricted solely to the given specimen only.

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