

Interpretation of Blood Test Results

(Health check up at the time of employment)

Classifications

- A :** The measurement value is within the reference range.
- B :** The measurement value deviates slightly from the reference range.
Please undergo a medical interview, re-examination, or treatment or seek advice for improving your life habits as deemed necessary.
- C :** The measurement value deviates from the reference range.
You should undergo a medical interview, re-examination, or treatment or seek advice for improving your life habits.

Each result is just an indication of your health. Regardless of the results, if you have noticed any symptoms or are currently undergoing observation or treatment, please consult your doctor or the Health Center.

What are reference ranges ?

Reference ranges (normal ranges, standard values, normal levels, reference values, etc.) are defined as the range of values, and 95% of the population, who are considered to be healthy, fall under these ranges.

●White Blood Cell (WBC)

WBC count increases when there is inflammation due to bacterial and other infections, one's physical constitution, smoking, drug use (corticosteroids etc.), or hematological disorders. On the other hand, a decrease in WBC count may be attributed to viral infection, one's physical constitution, liver disorders, drug use, or hematological disorders.

Anemia

- Red Blood Cell (RBC)
- Hemoglobin (HGB)
- Hematocrit (HCT)
- Mean corpuscular volume (MCV)
- Mean corpuscular hemoglobin (MCH)
- Mean corpuscular hemoglobin concentration (MCHC)

RBC count, HGB and HCT are decreased when there is anemia. It is important to figure out what causes abnormal levels of these since slowly progressive anemia often produces no symptoms.

To figure out what causes anemia, MCV, MCH, and MCHC are useful. MCV indicates the mean size of RBCs. MCH and MCHC indicate the mean amount of HGB and the mean concentration of HGB in each cell, respectively.

When decreased MCV and decreased MCHC are observed, it is diagnosed as microcytic hypochromic

anemia and is an iron-deficiency anemia, which is a common anemia and is caused by an insufficient intake of iron, gynecological disorders with hypermenorrhea, gastrointestinal blood loss, etc. When increased MCV and normal MCHC are observed, it is diagnosed as macrocytic normochromic anemia, which is induced by vitamin B₁₂ deficiency, folic acid deficiency, etc., the cause of which needs to be examined. When normal MCV and normal MCHC are observed, it is known as normocytic normochromic anemia and a thorough examination to determine the cause is necessary as it may indicate hematological disorders with erythropoietic suppression in bone marrow, hemolytic anemia, chronic inflammatory disorders, etc.

●Platelet Count (PLT)

A decrease in platelet count is caused by liver disorders, connective tissue diseases, or hematological disorders.

Liver

●Aspartate aminotransferase (AST (GOT)) ●Alanine aminotransferase (ALT (GPT))

●Gamma-glutamyl transferase (GGTP)

AST (GOT) and ALT (GPT) are enzymes that are present predominantly in the liver and increase when there is liver damage, the leading causes of which are hepatitis, fatty liver, alcoholic liver disease, etc. After vigorous exercise and so on, AST (GOT) increases since it is also present in skeletal muscles and myocardia. Although GGTP increases with liver disorders and biliary tract diseases, it is strongly associated with the consumption of alcohol or obesity.

Diabetes Mellitus

●Glucose (GLU)

Blood glucose level is high at all times in patients with diabetes mellitus (DM). Early detection and treatment for DM are important since DM causes serious complications such as arteriosclerosis, renal failure, visual loss due to retinopathy, numbness due to peripheral neuropathy, etc. DM is diagnosed if fasting plasma glucose ≥ 126 mg/dL and/or 2-hour postprandial glucose ≥ 200 mg/dL are detected.

Lipids

●Triglycerides (TG)

Normal triglyceride levels are less than 150 mg/dl. TG is included as a diagnostic criterion for metabolic syndrome. Not only LDL-C but also TG increases exacerbate arteriosclerosis. Being overweight, excessive intake of carbohydrates (sweets, rice, bread, etc.), and excessive alcohol consumption are known to increase TG.

●High-density Lipoprotein-Cholesterol (HDL-C)

High-density lipoprotein-cholesterol (HDL-C) is also called "good" cholesterol. A normal HDL-C level is more than 40 mg/dL. Low levels of HDL-C exacerbate arteriosclerosis since HDL-C has an anti-

atherosclerotic effect. Since smoking decreases HDL-C level, smoking cessation (stopping smoking) is very important. Furthermore, regular exercise increases HDL-C level.

●Low-density Lipoprotein-Cholesterol (LDL-C)

Low-density lipoprotein-cholesterol (LDL-C) is also called “bad” cholesterol. A normal LDL-C level is less than 140 mg/dL. LDL-C is the most important risk factor for atherosclerosis. Not only restricting eggs and fatty meat, but also restricting calories is important for those with high levels of LDL-C. The effect of exercise on controlling LDL-C is less than regulating TG and HDL-C.

The “lipid management targets for patients with different risk levels” offered by the Japan Atherosclerosis Society in 2017 are as follows. If patients do not have DM, family history of coronary artery disease (CAD), or other risk factors, their lipid management target is less than 160 mg/dL. If a patient cannot achieve their target LDL-C level after modifying their lifestyle, drug therapy should be considered. If patients have risk factors such as DM, hypertension, or smoking, their lipid management target is less than 120 mg/dL. If patients have a history of CAD, their lipid management target is less than 100 mg/dL.

Infectious Diseases

●IGRA (Mycobacterium tuberculosis test)

This test is used to detect Mycobacterium tuberculosis infection. If your test results are “positive” or “indeterminate,” it does not rule out Mycobacterium tuberculosis infection, so please consult with the Health Center. If your test results are “positive,” please come see a respiratory disease specialist (Dr. Mori or Dr. Nishimura) on one of their consultation days.

●Hepatitis C antibody (HCVAb)

Positive of HCVAb (1.0 S/CO or over) may indicate previous infection with hepatitis C virus (HCV). HCV is transmitted primarily through the body fluid including blood, so health care professionals who often handle them or materials and equipment contaminated by them are at high risks of its infection. If positive, please visit the Health Center and meet Dr. Yokoyama.

●Hepatitis B antigen (HBsAg)

HBsAg positive (more than 0.05 IU/mL) means *in vivo* hepatitis B virus (HBV) survival. Most of subjects who are HBsAg positive are carriers of HBV. They are advised to visit specialist’s office regularly. Subjects who are HBsAg positive are not eligible for the HBV vaccination.

●Hepatitis B antibody titer (HBsAb)

The transmission routes of HBV are similar to those of HCV, so health care professionals need to be careful also about HBV infection. History of HBV infection and HBV vaccination raise HBsAb level, and positive level is determined as 10.0 IU/L or more. Acquisition of positive titer of HBsAb means that of defense ability against HBV infection. Vaccination is recommended for subjects whose HBsAb titers are negative levels. Vaccinations will be given three times (basic vaccination) over half a year, but even if the result is negative, one vaccination (additional vaccination) may be sufficient for subjects who completed the basic vaccination. For details, please ask Dr. Yokoyama at Health Center. Hospital

staff and university staff can be vaccinated at public expense. Details will be announced in the department circulation (scheduled to be distributed in April next year).

Please have regular health checkups to manage your own health.

**Keio University Health Center
Shinanaomachi Branch**