Checklist on the influence separate factors have on lab test results

Age

- the erythrocyte level and haemoglobin concentration are a lot higher in newborns than in adults. Haemoglobin concentration is at its highest on days1-4 after the baby is born. During the first days after birth the arterial oxygen content increases. It causes erythrocyte decomposition;
- liver function and enzyme activity (bilirubin-glucuronyl transferase) are not fully developed in newborns, thus, bilirubin concentration, especially indirect bilirubin concentration, increases;
- alkaline phosphatase is the most active at 12-14 years of age (due to osteoblast activity);
- IgA production starts at 1-3 months, but normal immonuglobulin synthesis does not start until the baby is 1 year old;
- lipid concentration increases with age.

Race

- black people have higher levels of leucocytes and lower levels of granulocytes and monocytes;
- black people have higher levels of creatine kinase than white people (its activity depends on age, sex, and body mass);
- alpha-amylase is more active in Asian people, especially people in West India;
- black people have 1.35 times higher vitamin B12 concentration in the blood serum;
- black people have 2 times higher Lp(a) concentration, but it does not lead to more frequent atherosclerosis or higher mortality.

Pregnancy

- the volume of plasma goes from approximately 2,600 ml to 3,900 ml in normal pregnancy. This increase starts from week 10 and soars at week 35 of pregnancy;
- the volume of urine physiologically increases by about 25% around the third trimester of pregnancy;
- glomerular filtration increases by up to 50% during the last trimester;
- alkaline phosphatase activity increases as placental isoenzyme starts being produced;

Text continues on other side →

- concentrations of proteins which transport thyroxin, lipids, and copper increase (e.g. ceruloplasmin);
- pregnancy elevates concentrations of cholesterol, triglycerides, coagulation factors, CRP and other acute-phase proteins; ESR also increases (four or fivefold);
- as iron use becomes greater, iron and ferritin concentrations decrease;
- as the body stores fluids, the level of total protein and albumin in the blood decreases.

Diet

- the level of triglycerides in blood shoots up significantly after a meal. Depending on the food consumed, triglyceride concentration can increase by up to 50%, glucose concentration—by up to 15%, ammonia, urea, and uric acid concentrations become higher as well, especially if the food is rich in protein and amino acids;
- after a meal, aspartate aminotransferase activity increases by up to 20%, total bilirubin concentration becomes higher, the level of phosphorus increases by up to 15%, the levels of alanine aminotransferase and potassium—by up to 10%;
- extended fasting (for 48 hours) decreases the levels of blood proteins, apolipoproteins, cholesterol, triglycerides, and urea, and increases uric acid and creatinine concentrations.

Alcohol

- short-term effects (experienced after 2-4 hours): the level of glucose drops and the level of lactate elevates, because liver gluconeogenesis is inhibited. Alcohol is broken down into acetaldehyde and then acetate, therefore, the level of bicarbonates drops and metabolic acidosis develops, which, in turn, decreases uric acid excretion increasing its concentration in serum;
- long-term effects: GGT activity, AST and ALT increase due to toxic liver damage;
- chronic alcoholism elevates the concentration of triglycerides as their breakdown is reduced; consuming alcohol for 2 or more weeks, the level of CDT (carbohydrate deficient transferrin) in blood increases.

Drugs

- amphetamine increases the concentration of free amino acids;
- morphine increases the levels of alpha-amylase, lipase, alanine aminotransferase, alkaline phosphatase, aspartate aminotransferase, thyroid-stimulating hormone, and prolactin and decreases the level of insulin;
- heroin increases the levels of pCO_2, thyroxine, cholesterol, and potassium and decreases the levels of pO_2 and albumin;
- cannabis products increase the levels of potassium, sodium, chlorium, urea, and insulin and decrease the levels of glucose and uric acid.

Smoking

- increases the levels of adrenaline, aldosterone, cortisol, free fatty acids, monocytes, lymphocytes, neutrophils, haematocrit, MCV, and fibrinogen;
- chronic smokers have higher levels of low-density lipoproteins, tumour markers, enzyme activity, and heavy metal concentration.

NOTE: Do not smoke for at least 2 hours prior to the blood test!

Text continues on other side →

Caffeine

- caffeine inhibits phosphodiesterase and the breakdown of cyclic adenosine monophosphate (CAMP). CAMP is involved in glycogenolysis, therefore, glucose concentration in blood increases. By activating lipase, caffeine can initiate the increase in unesterified fatty acid concentration;
- an increase in catecholamine concentration in plasma is detected 3 hours after the consumption of 250 mg of caffeine;
- the levels of unesterified fatty acids, glucose, renin, and catecholamines increase.

  NOTE: the patient is asked to abstain from coffee for 12 hours prior to glucose, catecholamine, and renin concentration tests.

Height

- CRP increases by up to 65% at altitudes of 3,600 m or above;
- the level of b2 globulins increases by up to 43% (5,400 m);
- the levels of haematocrit and haemaglobin increase by up to 8% (1,400 m);
- the levels of urinary creatinine, creatinine clearance, and estriol decrease by up to 50% (4,200 m), serum osmolarity, plasma renin, and serum transferrin also see a drop.

Circadian rhythm

Analyte	Maximum concentration in a 24-hour day
Iron	2-6 p.m.
Potassium	2-4 p.m.
Sodium	4-6 a.m.
Phosphorus	6p.m.-midnight
Cortisol	5-8 a.m.; minimum concentration: 9 p.m.-3 a.m.
Glucose tolerance test	If performed after noon, the test gives false results because of cortisol

Fluctuations in concentration

Analyte	Max (hours)	Min (hours)	Fluctuation %
ACTH	6-10 a.m.	0-4 a.m.	150 - 200
Cortisol	5-8 a.m.	9 pm.-3 a.m.	180 - 200
Testosterone	2-4 a.m.	8 p.m.-midnight	30 - 50
TSH	2-4 a.m.	7a.m.-1 p.m.	15
T4	8 a.m.-noon	11 p.m.-3 a.m.	10 - 20
Haemoglobin	6 a.m.-6 p.m.	10 p.m.-midnight	8 - 15
Iron	2-6 p.m.	2 a.m.-4 a.m.	50 - 70
Phosphorus	6 p.m.-midnight	4 a.m.-8 a.m.	60 - 8

Text continues on other side ➔

Time of the year

- triiodothyronine concentration is 20% lower in summer than in winter.

Physical activity

- creatine kinase activity quadruples;
- sport increases concentration levels of adrenaline, noradrenaline, adrenocorticotropic hormone, and cortisol, and decreases the level of insulin;
- the levels of leucocytes, glucose, pyruvate kinase, AST, Bil, Urea, UA, P, Alb, Ca, Na, K, and ALP increase;
- cycling increases PSA levels.

Medication

- do not take supplements with iron for two weeks prior to the iron blood test;
- statins increase AST and ALT activity;
- oral contraceptives increase the level of transport proteins (especially ceruloplasmin);
- glucose, coagulation factors, and enzymes are especially sensitive to the effect of medication metabolites.

  NOTE: if you can do not take medication at least 24 hours prior to the lab test, but this will of course depend on your condition.

Medical Diagnostics and Treatment Center

V. Grybo g. 32A, 10318 Vilnius, Lietuva

Registration +370 698 0000

www.medcentras.lt

I-V 7.00 a.m.–8.00 p.m. MRI examinations 7.00 a.m.–9.00 p.m.
VI 8.00 a.m.–3.00 p.m. MRI examinations – 7:00 a.m.-7:00 p.m.
VII 9.00 a.m.–3.00 p.m Only MRI examinations.

ⓘ The laboratory closes 30 minutes earlier than indicated.