



Cleveland Clinic

EXECUTIVE HEALTH PROGRAM

Reference Guide



General Health

COMPLETE BLOOD COUNT

Your complete blood count will provide insight into various aspects of your health, with indicators including:

Hemoglobin – The protein that carries oxygen to all body tissues, carried in red blood cells; low value may indicate anemias or inherited blood disorders.

Anemia – A low red blood cell count usually from blood loss or from bone marrow problems making blood.

Hematocrit – A ratio (expressed as a percent) of red cells to whole blood; reduced in anemias; increased in chronic lung conditions.

White Blood Cell Count – May be elevated in inflammation or infection, and in smokers. When elevated, a more detailed analysis of specific types of white blood cells may be indicated. May be decreased with certain medications, viral illness or in nonspecific fluctuations.

MCV (Mean Corpuscular Volume), MCH (Mean Corpuscular Hemoglobin), MCHC (Mean Corpuscular Hemoglobin Concentration) – Measures the size and hemoglobin content of red cells; useful in evaluating subtypes of anemia.

An increased level of MCV may indicate deficiencies of vitamin B12 or folic acid, or excessive smoking or alcohol use. A decreased level may be seen in iron deficiency or thalassemia.

Platelet Count – Platelets are blood products critical for normal clotting. Abnormal values (either high or low) may be clues to an underlying blood disorder. Platelets are also affected by certain medications, alcohol, infection, liver disease and, in women, the menstrual cycle. Slightly low levels are very common.

CHEMISTRY PROFILE

Total Protein – Combination of albumin and globulin. Abnormal values may occur due to kidney, bowel or liver diseases or malnutrition. Proteins characteristic of certain conditions, such as multiple myeloma (bone marrow cancer), can be detected. Proteins can be further characterized through electrophoresis (a lab test) of the blood serum and urine.

Albumin – Blood protein manufactured by the liver, which makes up two-thirds of total protein. Marked changes may be related to

kidney, bowel or liver diseases or to poor nutrition.

Calcium – Mineral found primarily in bones. May be elevated with bone injury (fractures), cancers that spread to the bone and certain endocrine abnormalities such as overactivity of the parathyroid glands. Low values occur with poor dietary intake, lack of vitamin D or kidney disorders.

Phosphorus – Mineral related to bone activity and diet. Abnormalities can be seen in individuals with gastrointestinal, renal, bone or calcium disorders.

Magnesium – Mineral that activates enzyme systems. Can be abnormal with alcohol abuse, diabetes, certain endocrine and kidney disorders, bowel disease and diuretic usage.

Bilirubin, Total – The level of bile pigment in the blood. Elevated levels occur with liver disease or an accelerated breakdown of red blood cells (hemolysis). Slight increases frequently occur in a benign condition, called Gilbert's syndrome, and are of no clinical significance.

Uric Acid – Final breakdown product of nucleic acid metabolism. Elevated most commonly with gout. Can be elevated with malignancies, excessive alcohol intake, kidney disorders, insulin resistance syndrome, a high protein diet and certain medications.

Alkaline Phosphatase – Enzyme in the blood related to liver or bone. Various liver diseases in which bile ducts are blocked lead to an increase. Elevated levels also can be seen with certain bone disorders.

GGT (Gamma-Glutamyltransferase) – A liver enzyme that rises with high sensitivity for liver disorders. It can rise in response to excessive intake of alcohol and/or high cholesterol or triglycerides, excess body weight, fatty liver and insulin resistance syndrome.

ALT (Alanine Aminotransferase)/ AST (Aspartate Aminotransferase) – Enzymes found in the liver and muscle. Damage to these tissues may increase values. Liver disease tends to increase ALT relatively more than AST. Elevations of these enzymes need to be interpreted in the context of other liver function test results. AST also is found in muscle cells, including the heart, and may be elevated if these tissues are damaged.

Glucose – Blood sugar level frequently elevated in diabetes and mildly elevated in pre-diabetes. Can also be influenced by diet (inadequate fasting) and certain medications. A single elevation, particularly of mild degree, does not necessarily mean that diabetes is present. Low levels, called hypoglycemia, can be due to

excessive medications, or certain medical conditions (such as endocrine disorders, liver disease or rare tumors) or a prolonged fasting state.

Hemoglobin A1C (Glycosylated Hemoglobin) – A measure that reflects average blood sugar over the preceding three months. Normal values are 4.0 to 5.6 percent. Levels between 5.7 and 6.4 indicate pre-diabetes and increased risk for diabetes. Ideal values for people already known to have diabetes are below 7.0 percent.

BUN (Blood Urea Nitrogen)/ Creatinine – Kidney function tests that measure how well certain waste products of metabolism are excreted from the body. BUN is frequently elevated with dehydration. Persistent elevated creatinine indicates chronic kidney disease.

Sodium – Mineral and electrolyte that helps maintain fluid balance and volume. Can be abnormal in kidney disorders, certain endocrine diseases, dehydration or overhydration.

Potassium – A mineral and electrolyte important in nerve impulse conduction and body fluid balance. Can be low with use of diuretic therapy, diarrhea and certain endocrine diseases. Increased with kidney disease, potassium-sparing diuretics, certain other medications such as ACE inhibitors, and certain endocrine diseases. Mild elevations of no clinical consequence frequently occur with breakdown of red blood cells (hemolysis) in the blood drawing process.

Chloride – Mineral important in maintenance of electrolyte balance. Low levels are seen after prolonged vomiting or excessive use of diuretics. Mild increases are common and may not be due to any clinically significant condition.

CO₂ (Carbon Dioxide) – A measure of the bicarbonate buffer system in the plasma. Increased in conditions of alkalosis from excessive ingestion of antacids or prolonged vomiting. Decreased in acidotic conditions such as chronic respiratory failure, diabetes or kidney failure. Mildly abnormal results are common, and are of no clinical significance.

Anion Gap – A calculation used by the physician to determine the likely cause of excessive acid in body fluids (acidosis). An increased anion gap is seen in acidosis from diabetes, aspirin intoxication and kidney failure. Acidosis from diarrhea occurs with a normal anion gap.

Iron/TIBC/Transferrin Saturation – Tests used to evaluate iron metabolism. In iron deficiency anemia, iron levels are typically low and TIBC (total iron binding capacity) is high. In iron overload states such as hemochromatosis, iron levels and transferrin saturation are typically high.

Ferritin – A blood test to measure serum ferritin levels in your blood. This blood test can show whether there is too much or too little iron in your body.

OTHER LAB TESTS/ SCREENINGS

TSH (Thyroid Stimulating Hormone)

– Hormone secreted by the pituitary gland that regulates the production of thyroid hormones. When increased, it may indicate under-function of the thyroid gland (hypothyroidism) or failing thyroid gland. When decreased, it may indicate over-function of the thyroid gland (hyperthyroidism) or pituitary gland malfunction. This is also used to determine appropriate dosing of thyroid replacement medication.

Free T4 – This test of the thyroid hormone produced by the thyroid gland can reveal an underactive or overactive thyroid state, or pituitary (master gland) dysfunction.

Vitamin B12 (Cobalamin) – An essential growth factor that plays a role in the metabolism of cells, particularly in the gastrointestinal tract, bone marrow and nervous tissue. A low vitamin B12 level stops DNA synthesis and affects cell growth and repair. Vitamin B12 deficiency may lead to memory loss, and problems of the nervous system, anemia or skin changes. Strict vegetarians, the elderly and people with inflammatory bowel disease are at an increased risk of deficiency.

Hepatitis C – A viral hepatitis that may be chronic and produce no symptoms for a long time. There is no vaccine for hepatitis C, but it can now be cured with antiviral medication. A blood test for antibodies to hepatitis C is the best screening method. A one-time screening blood test is

recommended for all adults. If the antibody test is positive, additional testing is advised to detect whether the virus itself is present in the blood.

CHEST X-RAY

Chest X-Ray may be performed, to detect:

Nodule or Density – An area difficult for X-rays to penetrate and appearing as a white or gray spot on the lung in an X-ray. The significance and need for further testing depends upon nodule appearance.

Granuloma – A small area of healed inflammation, often from a remote fungal infection.

Calcification of the Aorta – Advanced hardening of the main artery leaving the heart.

CHEST CT

Low Dose CT Scan of the Lung –

Indicated for people with a significant smoking history or as a more detailed picture of the lungs to screen for lung cancer.

Pleural Thickening – Thickening of the lining that covers the lungs.

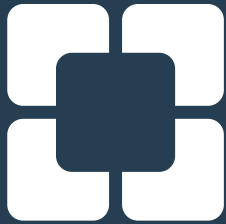
BONE HEALTH

Bone Mineral Density – This test is used to predict your potential bone fracture risk. It is only one of several factors that predict risk, in addition to a history of previous bone fractures, age, small body and bone size, tendency to fall, and family history

of early osteoporosis. Although the T-score compares your bone density to a 21-year-old female considered to have peak bone mass at that age, it is only an estimate of your possible bone fracture risk. A T-score less than -1.0 suggests possible thinning of the bone, often called osteopenia, while a score of -2.5 or less suggests an even lower degree of bone density in the osteoporosis range, which is associated with a possibly higher risk of bone fractures. The bone mineral densitometry scores are only suggestive of possible risk of bone fractures and are not in themselves diagnostic of osteoporosis.

The following is evaluated in conjunction with bone mineral densitometry:

Vitamin D – Vitamin D is important for adequate calcium absorption. Low vitamin D levels can lead to low bone density. Vitamin D levels are useful in making treatment recommendations for preventing osteoporosis or treating low bone density.



Urological and Kidney Health

URINALYSIS AND URINE TESTS

Presence of the following in urine shed light on urological and kidney health:

Glucose – May be present when blood sugar is too high (as in diabetes) or, rarely, in unusual disorders of the kidney, or from low kidney glucose threshold without disease. Certain diabetic medications increase glucose in the urine.

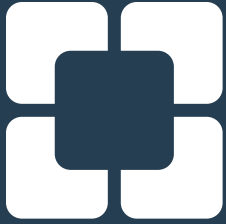
Ketones – Often present in urine because of the fasting state when the urine was collected. May be present in diabetics, in thyroid disorders, with fever, excess alcohol intake or with significant dieting.

Protein – Generally is not present in the urine beyond a trace amount. May be present in inherited or acquired kidney diseases, prostate diseases or systemic diseases (including various infections, collagen-vascular diseases, diabetes or reaction to drugs). May also be found due to jogging or excessive exercise prior to the test, or in women if urine is contaminated with vaginal secretions.

Blood – Can be present normally in small amounts. May be present with infection, kidney stones, malignancy, diseases of the kidney or prostate, or contamination of the urine by vaginal secretions. After very heavy physical exertion, blood can be present in the urine.

Leukocyte Esterase – A positive test may indicate infection of the urinary tract or contamination of the urine by vaginal secretions or skin cells.

Urine Albumin/Creatinine Ratio – A test to determine the amount of protein (albumin) present in the urine. In diabetics, the presence of albumin in the urine (indicated by an increased albumin/creatinine ratio) is suggestive of early diabetic kidney disease. In both diabetics and non-diabetics, elevated urinary albumin/creatinine ratio has also been found to be a predictor or marker for the presence of cardiovascular disease. The ratio is more important than the individual components.



Cardiovascular Health

LIPID PROFILE

Total Cholesterol – Blood fat significant in the development of atherosclerosis, made up of HDL, VLDL and LDL. The goal generally is <200. In persons with known coronary artery disease, the target is lower, <170.

HDL (High Density Lipoprotein) – A combination of fat and protein, “good” type of cholesterol because it removes excess cholesterol from the blood and takes it to the liver. Target is >45 in men, >55 in women.

VLDL (Very Low Density Lipoprotein) – A “bad” type of cholesterol, because it is a carrier for triglycerides. Goal is <40.

LDL (Low Density Lipoprotein) – Another “bad” type of cholesterol because it picks up cholesterol from the blood and takes it to the cells. The goal generally is <130. If coronary disease is present or a person has other cardiovascular disease, diabetes, or high cardiovascular disease risk, the goal is <100 or even lower, <70.

Triglycerides – Another blood fat that contributes to the development of atherosclerosis. Target is <150. Can be increased by consuming alcohol or

sugar, such as fruits and unsweetened juices, certain medications, and in thyroid and liver disease.

Apoprotein B – A protein present in a 1:1 ratio with the number of all atherogenic or bad lipid particles in the blood. A high level of this protein suggests increased risk for coronary atherosclerosis, particularly in men. Target goal is <90 mg/dL.

OTHER BLOOD TESTS (AS REQUIRED)

High Sensitivity-CRP (hs-CRP) – CRP is a well-documented clinical marker of general and cardiac-related inflammation. Elevated CRP is associated with the risk of future adverse cardiovascular events.

Lipoprotein (A) [Lp(a)] – A fraction of the LDL cholesterol that has been linked to increased risk for cardiovascular disease and is frequently present in families with premature vascular disease. If elevated, your physician may employ a more aggressive approach to lowering your LDL cholesterol level to <100 or even lower, <70. It does not typically change throughout ones life. Medication, diet and exercise will not affect the level.

Urinary Microalbumin/Creatinine

Ratio – Microalbuminuria screening is beneficial for the detection and prevention of cardiovascular and kidney disease in patients with diabetes as well as the general population.

RESTING ELECTROCARDIOGRAM

Frequently, minor changes are noted in the reporting of the resting electrocardiogram (EKG). Unless specifically commented upon by the physician, these changes should be regarded as normal variants unassociated with increased risk of heart disease. Your report may indicate the following:

Sinus Bradycardia – Slower than the average resting heart rate, which may be due to good aerobic conditioning or to certain medications. Usually not of clinical significance.

Premature Ventricular Complex (PVCs) – Extra beats arising from the lower chambers of the heart.

Premature Atrial Complex (PACs) – Extra beats arising from the upper chambers of the heart.

Sinus Arrhythmia – Minor variations in the interval between heartbeats.

Left Axis Deviation – Indicates a more prominent electrical force on the left side of the heart. This may be associated with thickening of the heart muscle, however many individuals will have no abnormal heart findings.

Right Bundle Branch Block (RBBB) – Presence of a delay in electrical conduction to the heart muscle. Right bundle branch block increases with age and is estimated to occur in 0.2 to 0.8% of the general population. It is found in both healthy peoples as well as in various forms of heart diseases and sometimes leads to the future need for a pacemaker. Most people with RBBB do not have underlying heart disease. In the absence of any symptoms or findings of heart disease, no further evaluation is required.

Incomplete Right Bundle – A delay in electrical conduction to the heart muscle for which no evaluation is this finding is required.

First-Degree AV Block – A slight delay in electrical conduction through your heart. According to the Framingham Heart Study, first-degree AV block is associated with somewhat greater future risk of needing a pacemaker and developing an abnormal heart rhythm known as atrial fibrillation.

Possible Left Ventricular Hypertrophy (LVH) – Suggests the possibility of some thickening of the heart muscle which can result from hypertension, weight gain and other conditions affecting the heart. Commonly, no abnormalities are found on further study and it may simply be a variation of normal, especially in athletic individuals. An echocardiogram or ultrasound study of the heart determines the presence of LVH more precisely.

Early Repolarization – A normal variant, is associated with minimal risk of rhythm disturbances in the heart. No intervention for this finding is needed unless you develop symptoms of palpitation and/or any evidence of heart rhythm disturbance.

Possible Left Atrial Enlargement – Suggests possible enlargement of left atrial capacity of the upper heart. Not a worrisome finding and evaluation with echocardiogram is optional. Many patients with an echocardiogram showing left atrial enlargement are entirely normal.

Non-Specific T Wave Changes and Myocardial Changes – Minor alterations in the shape of the EKG tracing.

Evidence of Prior Myocardial Infarction – Patterns on the resting EKG suggesting remote damage to part of the heart muscle. Such findings, particularly if new, may require further testing to determine their validity. Occasionally, patients may have suffered a heart attack without knowing it. Often, however, these EKG changes represent

alterations in the patterns of electrical conduction in the heart and not actual heart damage.

BPTRU™

This series of automatic blood pressure readings provides an average blood pressure for the patient. Readings are obtained in a quiet setting, providing a more accurate assessment of blood pressure.

EXERCISE TREADMILL TEST (STRESS TEST)

A test that monitors cardiovascular health during exercise on a treadmill or stationary cycle. It is used to determine the risk of coronary artery disease or the effectiveness of treatment for it.

Predicted Maximum Heart Rate – Fastest heart rate expected at peak exercise based on age.

METS (Metabolic Equivalent) – A measure of exertion during exercise used to assess fitness (or functional capacity). The higher the MET level achieved during the exercise test, the greater the fitness. 1 MET = the energy expended at rest.

Duke Treadmill Score – A composite score based on several features of an exercise test: duration of exercise, the presence and severity of angina during exercise, and the maximal change in the ST segment on the electrocardiogram. The Duke Treadmill Score has been found to be an independent predictor of future cardiovascular risk and total mortality.

Heart Rate Recovery – The difference between heart rate at peak exercise and at one minute into the cool down phase of the exercise test. The heart rate should fall by 12 beats per minute or more in this interval. Abnormal heart rate recovery has been shown to be predictive of future cardiovascular risk and total mortality.

Chronotropic Response – This measures the ability of the heart rate to rise normally with exercise. A blunted or impaired chronotropic response to exercise has been linked to future cardiovascular risk and total mortality.

NON-INVASIVE VASCULAR SCREENING

Carotid Ultrasound Study – An ultrasound probe is applied to both

sides of the neck to check for plaque and narrowings of the carotid arteries, particularly the internal carotid arteries that provide blood flow to the brain. Narrowing of the carotid artery is a risk factor for stroke.

Abdominal Aorta Ultrasound – An ultrasound probe is applied to the abdomen to measure the size of the aorta, the main blood vessel of the body that delivers blood to the vital organs and limbs. Enlargement of the abdominal aorta beyond three centimeters is suggestive of an abdominal aortic aneurysm.

Ankle-Brachial Index (ABI) – During this test, blood pressures are measured in both arms and ankles with a blood pressure cuff and a Doppler device is applied to listen to blood flow. The ratio to blood

pressures in the legs compared to the arms is called the ABI. A normal ABI is greater than one in most individuals. Reduced ABI in either leg indicates the presence of peripheral artery disease (PAD), which is due to plaque build up in the arteries of the leg. An abnormal ABI is also a marker of increased risk for heart attack and stroke.

Calcium Scoring of Coronary Arteries

- A scan to detect calcium in the coronary arteries which supply blood to the heart muscle. When calcium — usually not found in these arteries — is detected, it suggests the presence of atherosclerotic plaque. A calcium score of 0 means no calcified plaque is present; 1-10 means minimal plaque; 11-100 means mild plaque; 101-400 means moderate plaque; and over 400 means extensive plaque.



Visual Health Evaluation

Fundus Photography – A color photograph taken by means of a specialized retinal camera, which does not require dilating eye drops. The photo shows detailed images of the retina, and can show many abnormalities such as diabetic retinopathy, glaucoma, macular

degeneration, effects of high blood pressure, etc. The photographs are read by a retinal specialist from Cleveland Clinic Cole Eye Institute.

Tonometry – This is a diagnostic test that measures the pressure inside your eye, which is called intraocular

pressure. This measurement can help a doctor determine whether or not you may be at risk for glaucoma.



Digestive and Lung Health

COLONOSCOPY

Colonoscopy reports may include the following terminology:

Polyp – A benign growth on the inside or lining of the colon.

Pseudopolyp – Appears to be a polyp but not truly a growth. It is also benign and represents a fold of the lining of the colon.

Diverticulosis – Small outpouchings commonly seen on the wall of the colon. When they become inflamed the condition is called diverticulitis.

Hyperplastic Polyps – The most common colon polyp. Most hyperplastic colon polyps are benign, small and not associated with an increased risk of colon cancer.

Adenomatous Polyps – A type of colon polyp that has pre-malignancy potential. This growth is associated with DNA changes in the lining of the colon. Up to 10 percent of these polyps can become cancerous if undetected or ignored.

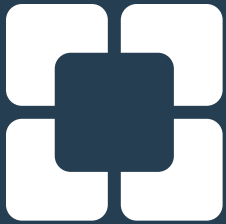
SPIROMETRY

This study of air capacity may identify breathing issues:

Borderline Restrictive Pattern – Suggests that the ability to take in and blow out a full breath (forced vital capacity – FVC) is lower than predicted for a Euro-American individual of the same height.

Individuals from various ethnic groups such as Japanese and Middle Eastern individuals may have falsely low FVC when compared to Euro-American individuals. A decreased FVC can be associated with fibrotic lung disease, chest wall trauma or old chest wall surgery, excess body weight, scoliosis, or a suboptimal testing effort or technique.

Borderline Obstructive Pattern – Can be seen in individuals who can get air into the lungs without difficulty but have some decreased ability to blow out a normal, predicted amount of air over one second. This finding can be associated with a tendency toward asthma or allergic bronchitis, smoking, resolving bronchitis, or a suboptimal testing effort or technique.



Women's Health

PAP TEST

The Pap test detects early changes in the cervix that can lead to cervical cancer. Many minor changes are noted on Pap smear results; not all indicate an abnormality. Some findings on Pap test reports include:

Endometrial Cells Present – If near the menstrual period, this may be normal. In post-menopausal women, it requires further evaluation.

Predominance of Coccobacilli/Shift in Vaginal Flora – This indicates only a change in the normal bacteria in the vagina, and requires no treatment unless symptoms are present.

Negative for Intraepithelial Lesion or Malignant Cells – This is a “normal” result.

Atypical Squamous Cells of Uncertain Significance (ASCUS) – This is a borderline abnormality that requires follow up, which will vary depending on medical history and HPV status.

Squamous Intraepithelial Lesion – A patch of irregular cells that generally requires evaluation by a gynecologist.

Atypical Glandular Cells of Uncertain Significance (AGUS) – An irregularity in gland cells that generally requires evaluation by a gynecologist.

HPV SCREEN

HPV (human papillomavirus) is a nearly ubiquitous virus in the same family of viruses that causes common warts. A positive HPV screen, combined with a borderline or abnormal Pap test, requires further evaluation. Conversely, a normal Pap test and negative HPV screen is the strongest assurance for a low risk of cervical cancer.

MAMMOGRAPHY

Mammography is an X-ray examination of the breasts. Some terminology that a mammography reports may include:

Cyst – A benign, thin-walled, fluid-filled structure.

Density – An area difficult for X-rays to penetrate.

Calcification – An area where calcium has accumulated, usually in an old infection or cyst. Depending on their appearance, some calcifications require further testing.

Intramammary Lymph Node – A normal lymph node located within the breast tissue and visible on a mammogram.



Men's Health

PSA (Prostate Specific Antigen) –

A protein produced by the prostate gland that rises in benign prostatic enlargement (a normal, age-related change), inflammation or infection of the prostate, and prostate cancer. Levels increase with age. Used in conjunction with the digital rectal exam to screen for prostate cancer.

Free/Total PSA – Blood tests which can be used to screen for prostate disorders.

Testosterone – In men, this hormone is produced by the testicles under the control of the pituitary gland and hypothalamus. It affects sexual function, muscle mass and strength, and is important in the maintenance of normal bone density, red blood cells mass and libido.

Bioavailable Testosterone – One way to measure the hormone testosterone (the other is total testosterone). Most of the testosterone in your blood attaches to 2 proteins: albumin and sex hormone-binding globulin (SHBG). Some testosterone is free, which means it is not attached to proteins. Testosterone is weakly bound to albumin and can be reversed easily, therefore albumin bound and free testosterone are considered to be bioavailable testosterone. This is the testosterone that is easily used by your body. While certain conditions (abdominal obesity is the most common) can decrease the protein, bioavailable testosterone isn't usually affected. So total testosterone may be low while bioavailable testosterone is normal. (Weight loss helps increase total testosterone.)

Please note that your exam will not include every evaluation described in this guide, but rather a custom combination of tests deemed appropriate by you and your Executive Health physician.



Every life deserves world class care.

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Cleveland Clinic is a nonprofit, multispecialty academic medical center integrating outpatient and hospital care with research and education for better patient outcomes and experience. More than 4,500 staff physicians and researchers provide services through 20 patient-centered institutes. Cleveland Clinic is a 6,026-bed healthcare system with a main campus in Cleveland, 18 hospitals and over 220 outpatient locations. The health system includes five hospitals in Southeast Florida with more than 1,000 beds, a medical center for brain health in Las Vegas, a sports and executive health center in Toronto and a 364-bed hospital in Abu Dhabi. Cleveland Clinic London, a 184-bed hospital, will open in 2022. Cleveland Clinic is currently ranked as one of the nation's top hospitals by *U.S. News & World Report*. clevelandclinic.org

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