

KNOW YOUR NUMBERS

YOUR GUIDE TO DIAGNOSTIC TESTS



WHAT ARE DIAGNOSTIC TESTS?

A diagnostic test is any kind of medical test that is performed to help diagnose or detect a disease or condition. These tests can be used for:

- **Screening** to identify risk factors that may lead to a person developing a disease
- **Diagnosis** to confirm that a person has or is free from a condition or disease
- **Patient Management** to measure the progress or recovery from disease



There are many different kinds of diagnostic tests. Some common examples include at-home pregnancy tests, x-rays, and blood tests ordered by your doctor. This pamphlet will focus on the last example, blood tests, which are typically ordered by your doctor.

HOW DO BLOOD TESTS WORK?

1. Blood testing begins with a sample of blood being drawn from a person's vein into a special collection tube. This can take place in a doctor's office, a reference laboratory or a hospital.
2. After the blood has been collected in tubes, it is sent to a clinical laboratory for testing.
3. Once the clinical laboratory receives the blood sample, it is processed and analyzed on an instrument. The instrument generates a report, which includes the results of the blood tests.
4. The blood test results are then sent back to your doctor.

WHEN SHOULD I GET THESE TESTS?

If you have reported to your doctor that you are not feeling well or have experienced symptoms related to illness, it is likely that he or she would order blood work to help diagnose your condition.

However, most often blood tests are ordered as part of a person's annual, routine physical examination. Results from these blood tests are used to evaluate a person's overall health. There are also blood tests that are routinely performed because they are recommended for people of a particular age, gender or population.

DID YOU KNOW?

More than 60 percent of all healthcare decisions are made using diagnostic test results.

source: The Lewin Group, 2005.

ENABLING PEOPLE TO

BE FEEL LIVE
HEALTHIER BETTER LONGER

ROUTINE BLOOD TEST EXAMPLES

Complete Blood Count (CBC)

Measures different parts of the blood to detect blood diseases and disorders. Abnormal CBC levels may be a sign of anemia, clotting problems, infections, blood cancers and immune system disorders.

Lipoprotein Panel (Total Cholesterol/HDL/LDL/TRI)

Measures cholesterol and triglyceride levels.

Abnormal cholesterol and triglyceride levels may be signs of increased risk for coronary heart disease.

Basic Metabolic Panel

Measures different chemicals in the blood to give doctors information about muscle (including heart), bone, and organ function. Includes:

+ Glucose

Abnormal levels of glucose may be a sign of diabetes. Persons with levels between 100 and 126 mg/dL may have impaired fasting glucose or pre-diabetes. These levels are considered to be risk factors for type 2 diabetes and its complications. Diabetes is typically diagnosed when fasting blood glucose levels are 126 mg/dL or higher.

+ Calcium

Abnormal levels of calcium may be a sign of kidney problems, bone disease, thyroid disease, cancer, malnutrition or another disorder.

+ Electrolytes

Abnormal levels of electrolytes may be a sign of dehydration, kidney disease, liver disease, heart failure, high blood pressure and other disorders.

Normal value ranges may vary slightly among different laboratories. Talk to your doctor about the meaning of your specific test results.

COMPLETE BLOOD COUNT TEST	NORMAL RANGE
RBC (red blood cell count)	for men: 4.7 to 6.1 million cells/mcL for women: 4.2 to 5.4 million cells/mcL
WBC (white blood cell count)	4,500 to 10,000 cells/mcL
Hematocrit	for men: 40.7 to 50.3 % for women: 36.1 to 44.3 %
Hemoglobin	for men: 13.8 to 17.2 gm/dL for women: 12.1 to 15.1 gm/dL
MCV (mean corpuscular volume)	80 to 95 femtoliters

cells/mcL = cells per microliter; gm/dL = grams per deciliter

LIPOPROTEIN PANEL TEST	NORMAL RANGE*
LDL (low-density lipoprotein)	70 to 130 mg/dL
HDL (high-density lipoprotein)	greater than 40 to 60 mg/dL
total cholesterol	less than 200 mg/dL
triglycerides	10 to 150 mg/dL

mg/dL = milligrams per deciliter

* The ideal values are different for people without coronary artery disease or other risk factors than for those with known coronary artery disease, diabetes, or high blood pressure.

BASIC METABOLIC PANEL TEST	NORMAL RANGE
glucose	up to 100 mg/dL
calcium	8.5 to 10.2 mg/dL
sodium [§]	135 to 145 mEq/L
serum magnesium [§]	1.7 to 2.2 mg/dL
chloride [§]	96 to 106 mEq/L
serum phosphorus [§]	2.4 to 4.1 mg/dL

mg/dL = milligrams per deciliter, mEq/L = milliequivalents per liter

[§] Electrolyte tests

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Blood test results are reported either as numbers, or as a positive or negative result. When they are reported as numbers, they are followed by the specific test's reference range. Reference ranges, also known as "normal ranges," are used to determine if your test result number falls within what is considered normal for a healthy person.

It is important to note that not all abnormal test results indicate there is a problem with your health. You should discuss blood test results with your doctor, who can determine what the result means in the context of your overall health and well being, and provide guidance on appropriate next steps.



WHY ARE THESE TESTS IMPORTANT?

Blood test results provide your doctor with a snapshot of your health, providing valuable information that can diagnose existing disease or even help to prevent certain medical conditions.

If your blood test results indicate that you may be at risk for developing disease, your doctor may suggest changes to improve your health, such as recommendations for diet or exercise.

3 THINGS TO REMEMBER

- 1. SCHEDULE YOUR ANNUAL HEALTH EXAM** Make an appointment to see your doctor every year to maintain good health.
- 2. GET YOUR TEST RESULTS** Ask your doctor to order a blood test with your annual health exam. Be sure to obtain a copy of the laboratory report from your blood work.
- 3. KNOW YOUR NUMBERS** Discuss the tests that were performed, what the results were and what they mean with your doctor.

WHERE TO GO FOR MORE INFORMATION

EDUCATIONAL RESOURCES

www.labtestsonline.org

A comprehensive guide to laboratory tests provided by the American Association of Clinical Laboratories

mylifecheck.heart.org

Health assessment tools sponsored by the American Heart Association

www.labresultsforlife.org

Stories of people's experiences with lab testing and how it helped them live healthier and longer lives

www.diabetes.org

Website for the American Diabetes Association

www.cancer.org

Website for the American Cancer Society

www.nih.gov

Website for the National Institute of Health, the nation's medical research agency

www.nhlbi.nih.gov

Website for the National Heart Lung and Blood Institute

www.medlineplus.gov

Health news and resources from the United States National Library of Medicine

RESOURCES FOR THE HEALTHCARE PRACTITIONER

www.OrthoClinical.com

Website for Ortho Clinical Diagnostics

www.Veridex.com

Website for Veridex

References

Pocket Guide to Diagnostic Tests, Third Edition, Nicoll D, et al. University of California, San Francisco, Lange/McGraw-Hill, 2001

The Value of Diagnostics: Innovation, Adoption and Diffusion into Health Care

http://www.nhlbi.nih.gov/health/dci/Diseases/bdt/bdt_types.html

<http://www.labtestsonline.org>

<http://www.nlm.nih.gov>