

If you are being examined for heart failure, your doctor will order blood and urine tests to provide general information about your health and clues to what may be causing your heart failure symptoms.

There is no single blood test to diagnose heart failure. The following is a list of blood tests that may be performed as part of your heart failure diagnosis or risk evaluation.¹ Some of these tests can be done with a simple blood sample, drawn in just a few seconds from a vein in your arm, or they can be done with a urine sample.

- **CBC (Complete Blood Count)**
- **Serum Electrolytes**
- **BUN (Blood Urea Nitrogen)**
- **Serum Creatinine**
- **Glucose (Blood Sugar) Test**
- **Lipid Panel (Cholesterol Tests)**
- **Thyroid Function Test**
- **BNP (B-type natriuretic peptides)**
- **Urinalysis**

CBC (Complete Blood Count)

This test measures the quality and number of red blood cells, white blood cells, hemoglobin (the oxygen carrier), and platelets in your blood. A CBC test can diagnose anemia, which may be a marker of advanced heart failure.²

Normal CBC Test Results For Women (Not Pregnant)

Count	Normal Range	
White Blood Cell	4,500 to 11,000 per mcl	3
or		
4.5 to 11.0 x 10	9	per L
Red Blood Cell	4.2 – 5.4 million per mcl	3
or		
4.2 to 5.4 x 10	12	per L
Hematocrit	37% to 47%	
or		
0.37 to 0.47 volume fraction		
Hemoglobin	12 to 16 g/dL	

or
7.4 to 9.9 mmol/L

er; g/dL = grams per deciliter; mmol/L = millimoles per liter

Serum Electrolytes

This test measures the amount of different electrolytes (molecules that carry an electric charge) in your blood, including sodium, potassium, chloride, and bicarbonate. Abnormal levels of electrolytes can be caused by heart failure, kidney problems, or other conditions. If you have heart failure, your electrolyte levels need to be monitored regularly to manage the levels of fluid in your body because taking diuretics or ACE inhibitors can alter your electrolyte balance too much if not monitored carefully.

Kidney and Liver Function Tests

A BUN (Blood Urea Nitrogen) test is used to determine how well your kidneys are working by measuring the amount of urea nitrogen in the blood. Blood urea nitrogen is a waste product that is filtered out of the blood by the kidneys: high levels of BUN indicate the kidneys are not working properly. An BUN level of more than 21 mg/dL is considered elevated, although the exact cutoff varies between laboratories. This can be caused by heart failure when the heart is not strong enough to pump sufficient blood to the kidneys, or by dehydration (caused by too much diuretic medication).

A serum creatinine test measures the amount of creatinine in the blood, another waste product that is filtered out of the blood by the kidneys. High levels of creatinine in the blood may be a sign of kidney problems resulting in fluid buildup. A normal value for women ranges from 0.5 to 1.1 mg/dL (milligrams per deciliter) or 44 to 97 $\mu\text{mol/L}$ (micromoles per liter).

Liver function tests measure the levels of enzymes produced by the liver. They are used to check how well the liver is working. In heart failure enzyme levels may be high if fluid is backing up into your liver.

Glucose (Blood Sugar) Test

A glucose test measures the amount of sugar in your blood. High blood sugar levels may indicate diabetes or pre-diabetes, both of which put you at risk for heart failure. Blood sugar is measured in milligrams (mg) per deciliter (dL) of blood. [Click here](#) for more information on diabetes and heart failure.

Blood Sugar Levels	
(Measured by Fasting Plasma Glucose)	
Normal	Less than 100 mg/dL
Pre-diabetes	100 to 125 mg/dL
Diabetes	126 mg/dL or higher

Lipid Panel (Cholesterol Tests)

A Lipid Panel measures the fatty substances (lipids) in your blood, including your total cholesterol, LDL (bad) cholesterol, HDL (good) cholesterol, and triglyceride levels.

Excess cholesterol that circulates in the blood can stick to the walls of arteries. Over time, this fatty plaque buildup narrows the arteries, causing [coronary artery disease](#) —a major risk factor for heart failure. [Click here](#)

[click here](#) for more information on coronary artery disease and heart failure; [click here](#) to find out what your cholesterol numbers mean.

Thyroid Function Tests

The thyroid gland, located in the neck, is one of the largest endocrine (hormone-producing) glands in the body. Hormones produced by the thyroid gland control how quickly the body uses energy and build proteins, as well as affecting the body's response to other hormones. Tests to determine how well the thyroid is working are part of a standard diagnostic workup because the hormones it produces affect all the systems of the body, including the heart.

Abnormal results of a thyroid-stimulating hormone test (TSH) could indicate that thyroid problems may be contributing to the development of heart failure.¹ When the thyroid gland does not produce enough hormones (*hypothyroidism*), the heart rate slows, the heart pumps out less blood, and the heart muscle's ability to contract is weakened. In one study of more than 3000 patients (60% were women), having a slightly underactive thyroid gland significantly increased the risk of developing heart failure in both women and men.

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On the opposite end of the spectrum, a thyroid that is too active (*hyperthyroidism*) can cause heart symptoms such as arrhythmias, palpitations, and shortness of breath.

BNP Test

This test measures the amount of BNP (B-type natriuretic peptides) in your blood. BNP are proteins released by the overworked heart into the bloodstream when the heart cells stretch in response to added strain. High levels of BNP may be a sign of heart failure.

A BNP test is useful for diagnosing or ruling out heart failure in patients with shortness of breath. It is also used to assess the effectiveness of heart failure therapy: if BNP levels drop, it means the treatment is working. The BNP test should not be used as the only test to confirm or rule out heart failure.

Urinalysis

This test examines how well your kidneys are working by measuring any physical or chemical changes in urine, such as color, clarity, and the presence of certain compounds. Your kidneys filter your blood and get rid of the waste and extra water as urine, so urine from normal kidneys should not include protein, sugar, blood cells, or bacteria or other parasites. Poor kidney function may be caused by a lack of blood supply to the kidneys caused by heart failure, and your kidney function can affect your heart failure symptoms and how your body regulates your blood pressure and responds to certain medications.

References

1. Hunt SA. ACC/AHA 2005 Guideline Update for the Diagnosis and Management of Chronic Heart Failure in the Adult: A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Writing Committee to Update the 2001 Guidelines for the Evaluation and Management of Heart Failure). *J Am Coll Cardiol*. September 20, 2005 2005;46(6):e1-82.
2. Schocken DD, Benjamin EJ, Fonarow GC, et al. Prevention of Heart Failure: A Scientific Statement From the American Heart Association Councils on Epidemiology and Prevention, Clinical Cardiology, Cardiovascular Nursing, and High Blood Pressure Research; Quality of Care and Outcomes Research Interdisciplinary Working Group; and Functional Genomics and Translational Biology Interdisciplinary Working Group. *Circulation*. May 13, 2008 2008;117(19):2544-2565.
3. Rodondi N, Bauer DC, Cappola AR, et al. Subclinical Thyroid Dysfunction, Cardiac Function, and the Risk of Heart Failure: The Cardiovascular Health Study. *J Am Coll Cardiol*. September 30, 2008 2008;52(14):1152-1159.

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