Protein Electrophoresis (Blood)

Does this test have other names?

Serum protein electrophoresis, SPEP

What is this test?

Protein electrophoresis is a test that measures specific proteins in the blood. The test separates proteins in the blood based on their electrical charge. The protein electrophoresis test is often used to find abnormal substances called M proteins. The presence of M proteins can be a sign of a type of cancer called myeloma, or multiple myeloma. Myeloma affects white blood cells called plasma cells in the bone marrow. Protein electrophoresis also tests for other proteins and antibodies (immunoglobulins).

The protein electrophoresis test is also used to diagnose other conditions affecting the plasma cells. These include Waldenström macroglobulinemia, monoclonal gammopathy of undetermined significance (MGUS), and primary amyloidosis.

Protein electrophoresis can also be used to help diagnose:

- Thyroid problems
- Diabetes
- Anemia
- Liver diseases
- Poor nutrition or inability to absorb nutrients
- Certain autoimmune diseases

Why do I need this test?

You may need this test if your healthcare provider believes that you have a condition affecting your plasma cells. These conditions may cause the following symptoms:

- Unexplained weight loss
- Bone pain
- Severe tiredness (fatigue)
- Weakness
- Nausea
- Constipation
- Abnormal thirst
- Frequent urination
- Frequent illness or fevers
- Bones that fracture easily

- Back pain
- High levels of calcium in the blood

What other tests might I have along with this test?

You may also need:

- Urine protein electrophoresis
- Serum immunofixation
- Bone marrow biopsy
- Immunotyping, to find what type of M proteins are present
- Complete blood count
- Blood calcium and electrolyte test
- Kidney and liver blood tests
- X-rays

What do my test results mean?

Test results may vary depending on your age, gender, health history, and other things. Your test results may be different depending on the lab used. They may not mean you have a problem. Ask your healthcare provider what your test results mean for you.

Serum proteins can be albumin or globulins. Globulins are divided into alpha-1, alpha-2, beta, and gamma globulins.

Normal levels are:

Albumin	3.8 to 5 grams per deciliter (g/dL)
Alpha-1 (α-1)	0.1 to 0.3 g/dL
Alpha-2 (α-2)	0.6 to 1 g/dL
Beta (β)	0.7 to 1.4 g/dL
Gamma (γ)	0.7 to 1.6 g/dL

How is this test done?

The test is done with a blood sample. A needle is used to draw blood from a vein in your arm or hand.

Does this test pose any risks?

Having a blood test with a needle carries some risks. These include bleeding, infection, bruising, and feeling lightheaded. When the needle pricks your arm or hand, you may feel a slight sting or pain. Afterward, the site may be sore.

What might affect my test results?

Your diet or lifestyle habits are not likely to affect the results of this test.

How do I get ready for this test?

You likely don't need to take special precautions before having this test. Your healthcare provider will tell you if you need to stop eating or drinking for a period of time before the test. Your provider will also tell you if you need to skip any of your regular medicines on the day of the test. Be sure to tell your healthcare provider about all medicines, herbs, vitamins, and supplements you are taking. This includes medicines that don't need a prescription and any illegal drugs you may use.