

Serum Free Light Chains

What are serum free light chains (FLC)?

Multiple myeloma is a malignant disease of B-lymphocytes, leading to overproduction of immunoglobulin from a single clone, which is detected in the biochemistry laboratory as a paraprotein.

A paraprotein may be intact (both heavy and light chains of the immunoglobulin) or light chain only. Light chains are normally cleared from the circulation by glomerular filtration, before being reabsorbed and catabolised in the proximal tubules.

Where there is significant overproduction of free light chains, these may be detected as overflow in the urine (termed Bence - Jones protein (BJP)) or elevated free light chains in the serum.

Why have I received FLC results when I didn't request this test?

When a patient is found to have a new paraprotein in their serum by electrophoresis, the laboratory will add serum free light chains to their sample. This will allow prompt assessment of both intact and light chain components of their disease prior to referral or discussion with haematology if required.

In patients where no paraprotein is detected in their serum, it remains critical that a urine sample for Bence Jones protein analysis is provided. Myeloma cannot be excluded in patients where this is not completed.

What do the FLC results mean?

Three values are provided with results from serum free light chain analysis: kappa, lambda and a ratio of the two. Concentrations of the two individual light chains, and their ratio, remain stable in each individual during health, however do tend to increase slightly with age.

Elevations in the free kappa and free lambda, with a normal ratio, are unlikely to be of clinical significance and are most likely due to inflammatory responses.

Elevations in a single light chain, with an abnormal ratio, may indicate myeloma or related disease. The probability of a malignant disease increases with the degree of abnormality. Borderline high ratios may be seen in cases with renal impairment, polyclonal inflammatory responses (e.g. infection, inflammation, autoimmune). In patients on dialysis, the normal free light chain ratio is considered to be 0.37 – 3.10.

What Next?

Free light chain Ratio	Suggested Action
0.26 – 1.65 or 0.37 – 3.10 if on dialysis	Normal free light chain ratio. No action required.
<0.01 or >100	Significant abnormality in free light chain ratio. Suggest urgent referral to haematology.
0.01-0.125 or 8-100	Abnormal free light chain ratio. Suggest discuss with haematology.
0.125 – 0.26 or 1.65 - 8	Slight abnormality in free light chain ratio may not be significant. Monitor paraprotein with serum electrophoresis in 3-6 months and consider discussion with haematology if this appears to be progressing.