Kappa/Lambda Quantitative Free Light Chain With Ratio, Serum

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Serum free light chain (SFLC) testing measures the concentrations of free, or unbound, kappa and lambda immunoglobulin light chains in the blood. The kappa-to-lambda ratio is compared to an established reference ratio to help diagnose monoclonal gammopathies. When combined with serum protein electrophoresis (SPEP), SFLC testing significantly increases the sensitivity for detecting monoclonal proteins (M proteins) compared with SPEP alone.[1] SFLC testing can be used as an alternative to urine immunofixation, except in patients with suspected amyloid light chain (AL) amyloidosis.[2] Additionally, SFLC testing is used in risk stratification, monitoring, and response assessment.

Disease Overview

Monoclonal gammopathies comprise a range of disorders marked by the abnormal presence of M proteins in the blood. When these proteins result from clonal proliferation of plasma cells, the condition is classified as a plasma cell dyscrasia. Clinical presentations of monoclonal gammopathies range from asymptomatic, premalignant conditions such as monoclonal gammopathy of undetermined significance (MGUS) to malignant or organ-damaging diseases requiring intervention, such as multiple myeloma and light chain amyloidosis.

Indications for Use

SFLC testing is indicated in the diagnostic workup of all patients with a suspected **monoclonal gammopathy** and is recommended to be ordered in conjunction with SPEP.[1]

Additional clinical uses for SFLC testing include:

- **Prognostication** of MGUS, smoldering myeloma, active multiple myeloma, AL amyloidosis, and solitary plasmacytoma[3]
- **Monitoring** disease activity in patients with light chain amyloidosis and light chain myeloma[3]
- **Response assessment**, as the kappa-to-lambda ratio is required to document a stringent complete response according to the International Myeloma Working Group (IMWG)[3]

Test Interpretation

Results

Quantitative SFLCs	Kappa/Lambda Ratio	Interpretation
Kappa **and** lambda within reference interval	Within reference ratio	Does not support the presence of a monoclonal gammopathy, but does not exclude it
Either kappa **or** lambda increased	Abnormal ratio	Supports the presence of a monoclonal gammopathy
Kappa **and** lambda increased	Within reference ratio or a slightly abnormal ratio	May indicate renal disease or chronic inflammation

Source: Association for Diagnostics and Laboratory Medicine[2]

Factors Affecting Ratio Reference Interval

Age and **renal function** can affect SFLC levels. Renal impairment, particularly in individuals with chronic kidney disease, may lead to elevated SFLC concentrations and an abnormal SFLC ratio, although the ratio typically remains within the normal range. Additionally, SFLC levels tend to increase slightly with age.[1]

References

1. Keren DF, Bocsi G, Billman BL, et al. Laboratory detection and initial diagnosis of monoclonal gammopathies. *Arch Pathol Lab Med*. 2022;146(5):575-590.

2. Association for Diagnostics and Laboratory Medicine. Serum free light chains. Published Feb 2024; accessed Sep 2025.

3. National Comprehensive Cancer Network. NCCN Clinical Practice Guidelines in Oncology: multiple myeloma. Version 2.2026. Accessed Sep 2025.

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