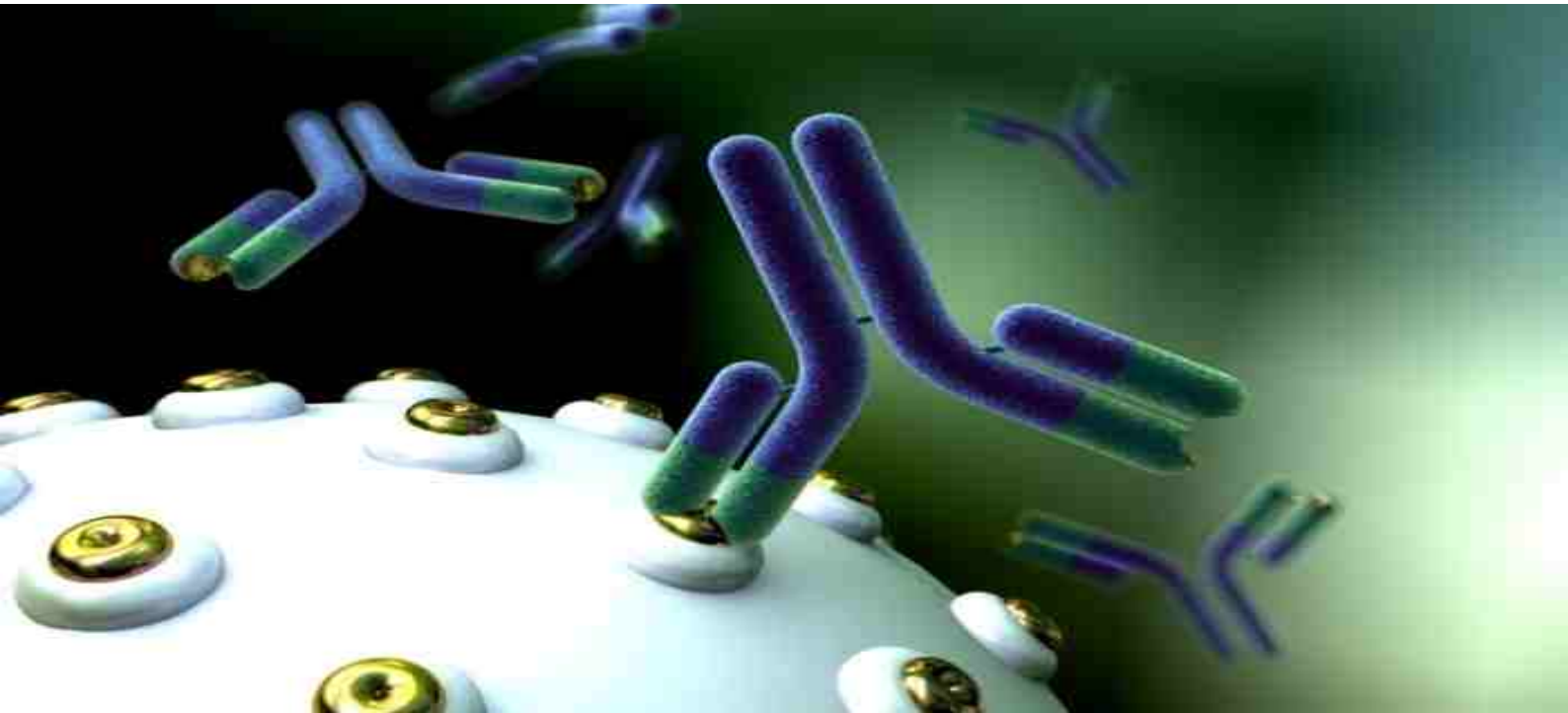


Serum Free Light Chain Assay

Freelite®



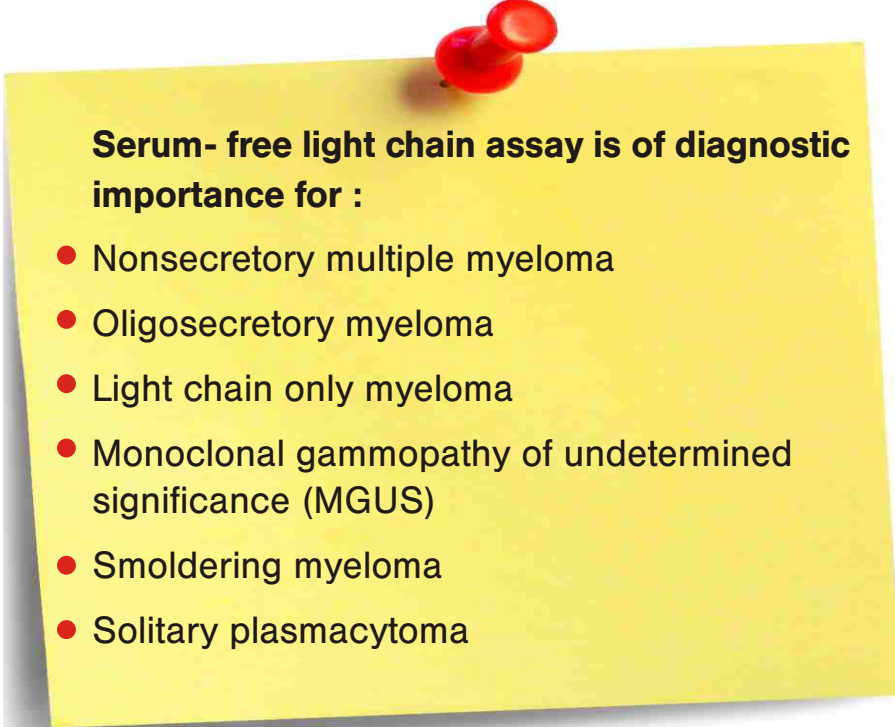
**International Myeloma Working group (IMWG)
National Comprehensive Cancer Network (NCCN)**

RECOMMEND

“Serum free light chain (FLC) assays in the initial diagnostic workup of multiple myeloma and related disorders to increase diagnostic sensitivity”

NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines) for Multiple Myeloma Version 2.2013

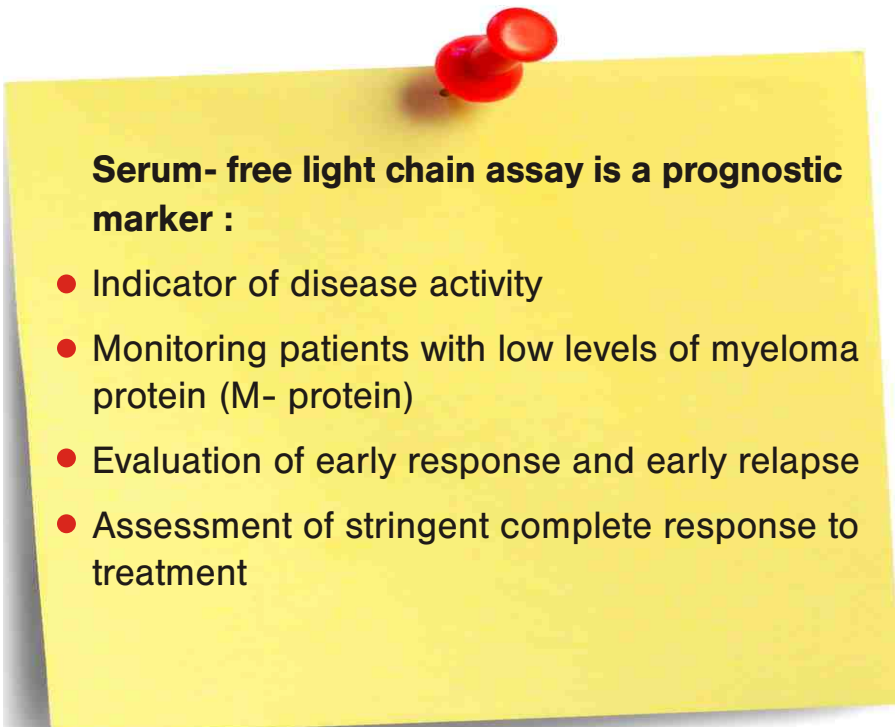
Freelite - New Marker for the Diagnostic & Prognostic Evaluation



Serum- free light chain assay is of diagnostic importance for :

- Nonsecretory multiple myeloma
- Oligosecretory myeloma
- Light chain only myeloma
- Monoclonal gammopathy of undetermined significance (MGUS)
- Smoldering myeloma
- Solitary plasmacytoma

(NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines) for Multiple Myeloma Version 2.2013)



Serum- free light chain assay is a prognostic marker :

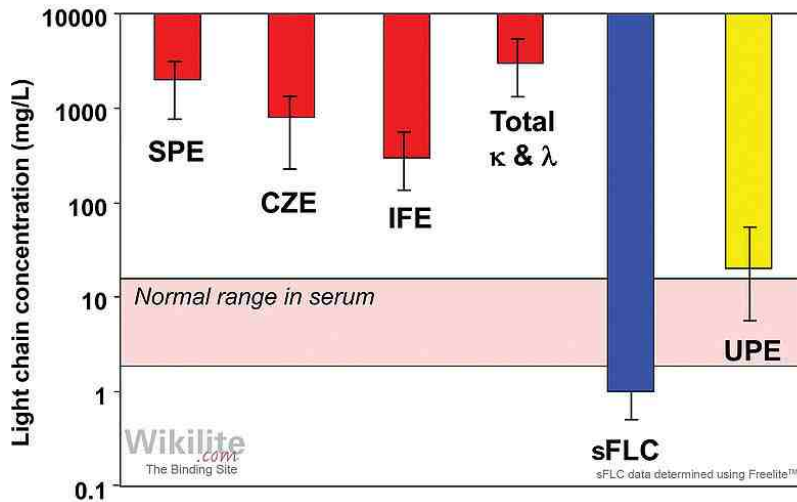
- Indicator of disease activity
- Monitoring patients with low levels of myeloma protein (M- protein)
- Evaluation of early response and early relapse
- Assessment of stringent complete response to treatment

(Report from International Myeloma Foundation : Understanding Serum Free Light Chain Report, 2011)

Freelite at Metropolis by Nephelometry : A Gold Standard Method

Nephelometry is at least a hundred times more sensitive than that of other assays¹.

Lower Limit Sensitivity of Various Assays



(SPEP: Serum protein electrophoresis, UPEP: Urine protein electrophoresis, IFE: Immunofixation electrophoresis, CZE: Capillary zone electrophoresis)

The Predictive Power of Serum Kappa / Lambda Ratio²

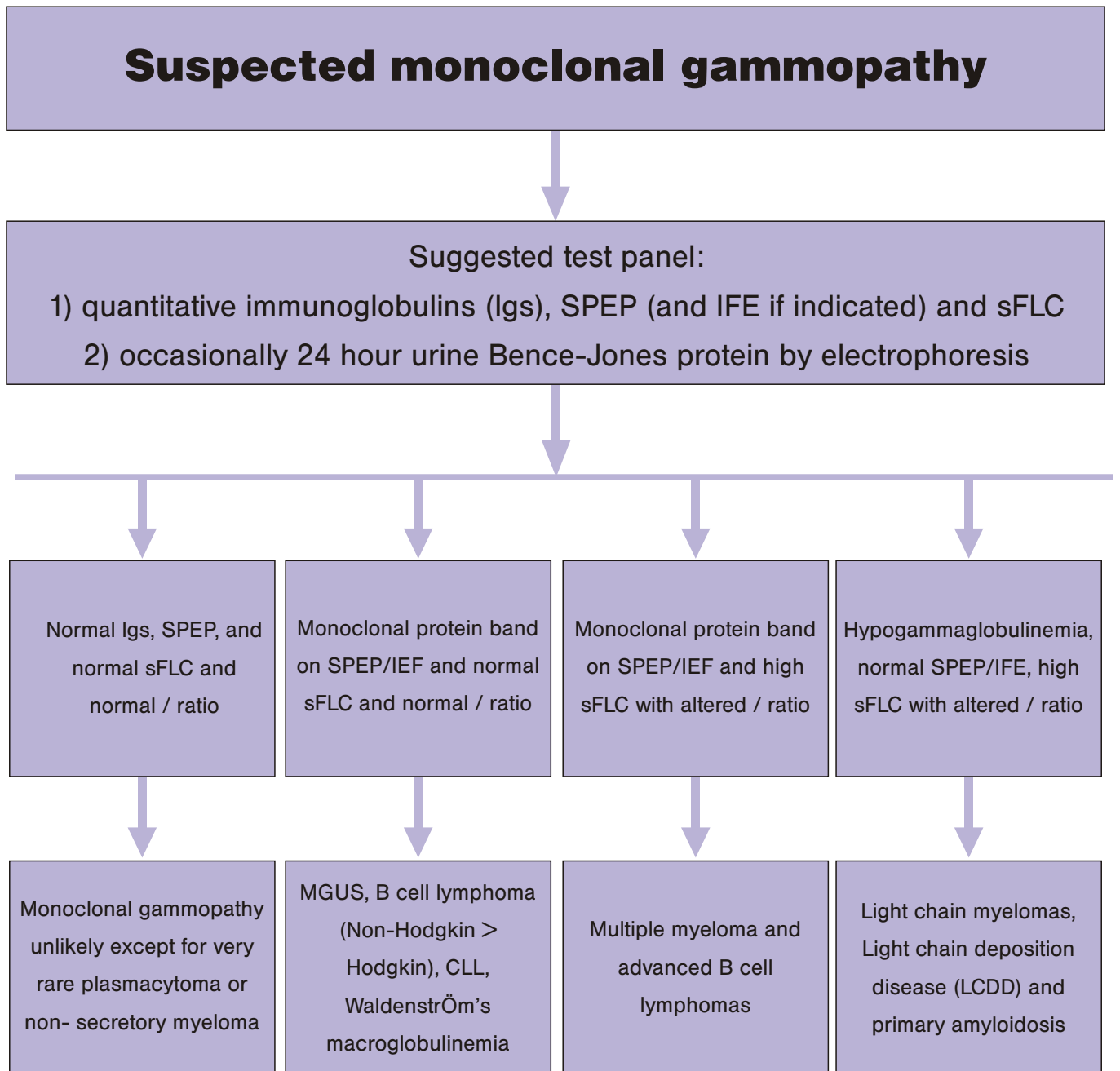
The FLC ratio is required for documenting stringent complete response* according to the International Myeloma Working Group (IMWG) Uniform Response Criteria³

If the level of either kappa or lambda is very high and the other chain is normal or low	The ratio is abnormal and indicates that the myeloma is active
If levels of both light chain are increased, but the ratio is normal	This generally indicates a disease other than myeloma, such as poor kidney function
If the kappa and lambda levels are both within the normal range, sometimes the ratio may be abnormal	Persistent low level of active myeloma with excess production of the abnormal light chains

* **Stringent Complete Response** : Complete Response(+) as defined below and Normalization of the free light chain ratio with no evidence of myeloma cells in the bone marrow

(+) **Complete Response** : Negative immunofixation in the serum and urine, disappearance of any plasmacytoma, and < 5% plasma cells in the bone marrow

Algorithm for Suspected Monoclonal Gammopathy⁴



Tests for Multiple Myeloma @ Metropolis Healthcare

Nephelometry	Freelite Chains (Kappa and Lambda), serum Kappa and Lambda – Free, Urine
Electrophoresis	Protein Electrophoresis, serum Protein Electrophoresis, urine 24
Immunofixation	Qualitative (serum, urine) – Includes protein electrophoresis and Immunofixation, same as Bence Jones protein Quantitative (serum, urine) – Includes Protein electrophoresis, quantification of heavy & light chains & Immunofixation with characterization of M band

Multiple Myeloma FISH Panel

Test	Probe	Gene(s)/Unique Sequence	Prognosis
Deletion	13q14.3	D13S319	Short event free survival
Deletion	17p13.1	P53	High risk marker
Ploidy analysis	11q23/15q22/9q34	MLL/PML/ABL	Favorable Prognosis
IGH rearrangement	14q32	IGH	
Translocation: t(11;14)	T(11;14)(q13;q32)	IGH/CCND1XT	Good Prognosis
Translocation: t(4;14)	T(4;14)(p16;q32)	FGFR3/IGH	Poor Prognosis
Translocation: t(14;16)	T(14;16)(q32;q23.1)	IGH/MAF	Poor Prognosis

1. Meletios D et al. Consensus recommendations for standard investigation workup: report of the International Myeloma Workshop Consensus Panel 3. *Blood*. 2011; 117(18): 4701- 4705

2. Report from International Myeloma Foundation : Understanding Serum Free Light Chain Report, 2011

3. NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines) for Multiple Myeloma Version 2.2013

4. Matthew S et al. Serum Free Light Chain Analysis. *Am. J. Hematol.* 85: 787-790, 2010