

# Approach to Paraproteinemia

## What is a paraproteinemia?

an abnormal ↑ in monoclonal immunoglobulin fragments or intact immune globulins produced usually by a malignant clone of plasma or B-cells



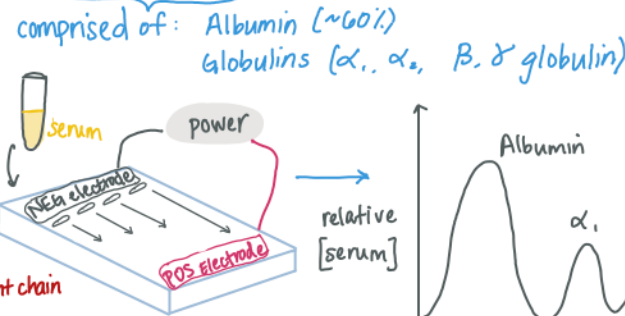
## How do I diagnose paraproteinemia?

① Crude measurement of a protein gap:  $[\text{total serum protein}] - [\text{serum Albumin}]$

② SPEP: serum protein electrophoresis  
- SPEP separates protein by physical properties (charge/size)

SPEP can tell you if there is an ↑ in gammaglobulin in plasma

SPEP cannot confirm monoclonality or if there is heavy vs. light chain



③ Immuno-fixation (IFX): tells you immunoglobulin type.

- adds antibodies to antigen (or immunoglobulin)  
IFX cannot detect small amounts of light chain and can miss Bence Jones protein in urine  
(NOTE: IgD, IgE not routinely ordered)

IgA	IgG	IgM	K	λ
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④ Serum Free Light Chain (SFLC): measures free light chains K or λ

- Abnormal K:λ ratio suggests multiple myeloma
- Sensitivity of SFLC ↓ in:
  - low amount of paraprotein
  - renal failure
  - Hypergammaglobulinemia

⑤ UPEP/urine IFX: can be helpful when SPEP/IFX/SFLC are inconclusive

- UPEP quantifies light chains in urine "Bence Jones"
- Urine IFX specifies which immunoglobulin is ↑

Sensitivities for M-protein	
SPEP:	80%
SPEP + IFX:	90%
SPEP + IFX + SFLC:	98%
↓ ⊕	
UPEP + IFX with IgD/E	