



The Royal College of **Pathologists**

Pathology: the science behind the cure

FRCPath Immunology Part 2 practical examination

Station 3 - Immunochemistry

Two example questions are given, including the images that would have been provided on an ipad as Supplementary Material, followed by the answers.

Example question 1

A 67 year old woman under investigation for osteoporosis had immunoglobulins with electrophoresis and urinary Bence Jones protein (BJP) performed. She had exactly the same results 6 months previously. Review the results in Figure 1 (A-D) of the Supplementary Material and then answer the questions below.

Figure 1A: Immunoglobulin analysis by rate nephelometry

Analyte	Results g/L	Reference Range g/L
IgG	13.7	6.0 - 16.0
IgA	1.93	0.80 - 4.00
IgM	0.78	0.50 - 2.00

Figure 1B: Serum capillary zone electrophoresis

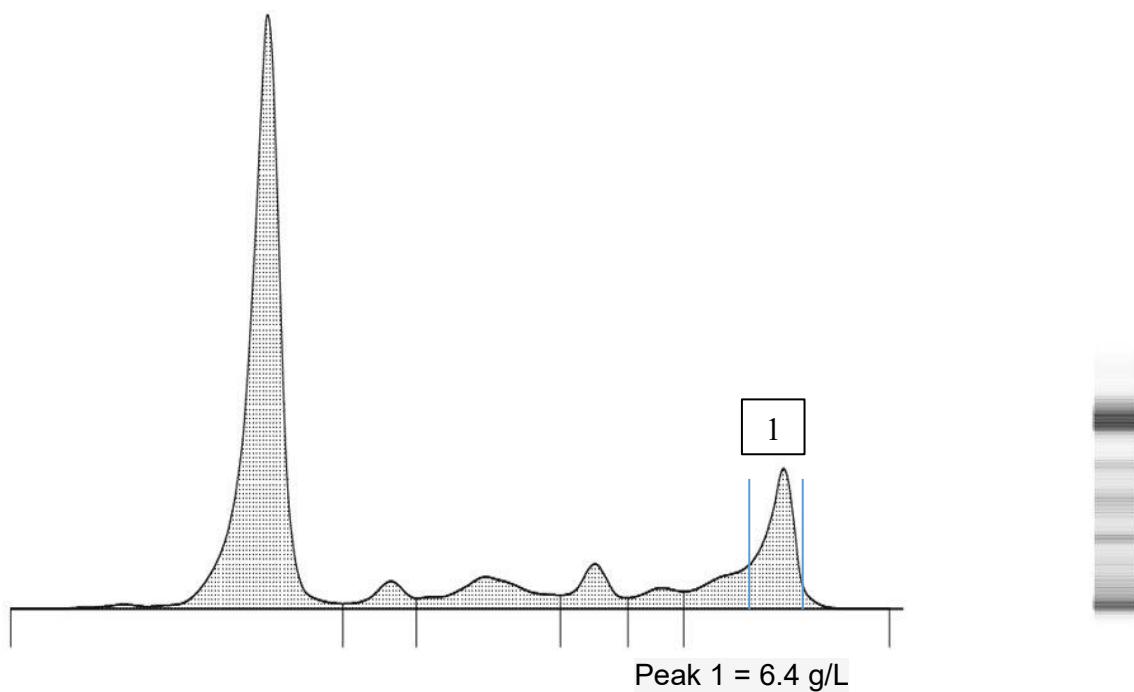


Figure 1C: Serum immunofixation

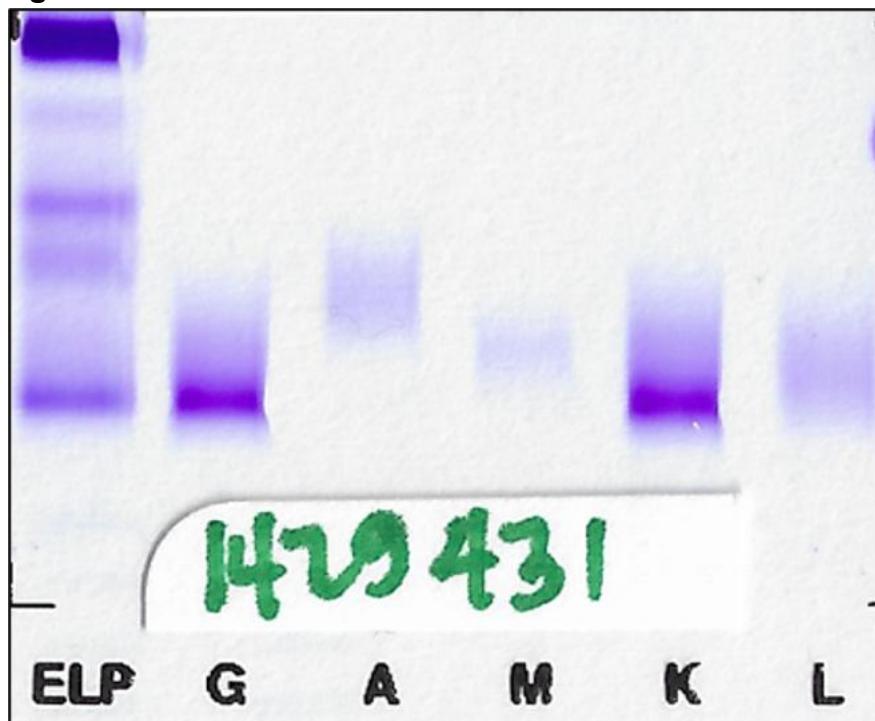
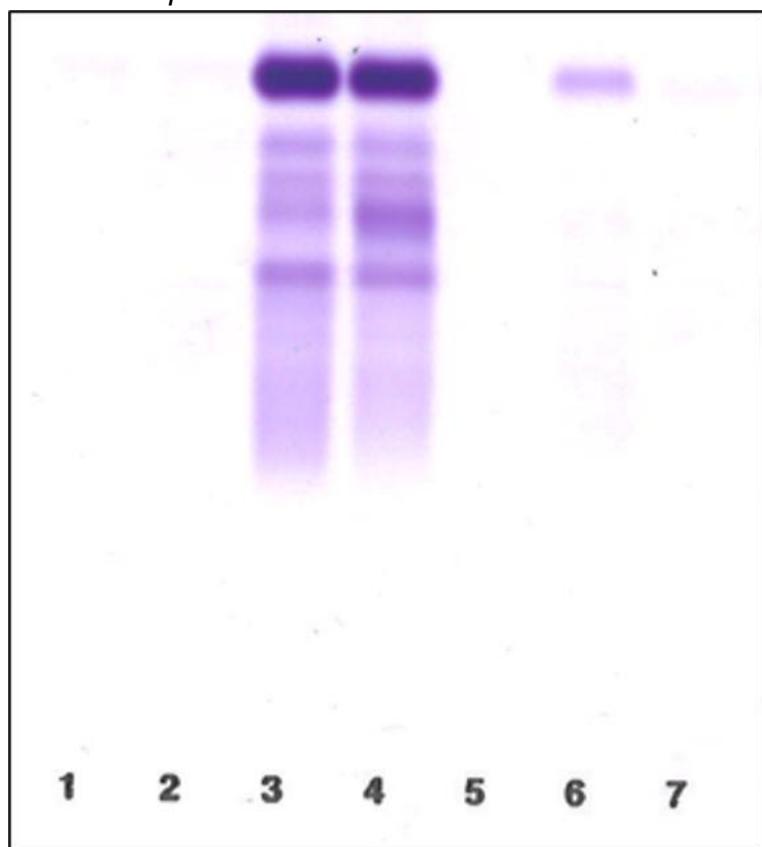


Figure 1D: Urine gel electrophoresis

Patient sample is in lane 6



- (a) Summarise the key findings in these results (3 marks)
- (b) What haematology and biochemistry tests would you expect the GP to have requested that would be relevant to assessing this case? (3 marks)
- (c) Assuming the tests in part (b) are normal, what is the most likely diagnosis? (1 mark)
- (d) The patient's GP telephones to discuss the case. What do you advise? (1 mark)

Example Question 2

A 43 year old woman has been referred to the Immunology Clinic with a 7 months' history of intermittent episodes of abdominal pain and vomiting lasting for a few days. She has also had a few episodes of tongue and lip swelling. She has lost 6kg weight in the last year. Physical examination showed an enlarged spleen and cervical lymphadenopathy. She is not on any medications and denies any previous episodes of similar symptoms. Refer to the results in Figure 2 below and then answer the questions.

Figure 2: Summary of serum results

Analyte	Result	Units	Reference range
IgG	6.8	g/L	6.0 - 16.0
IgA	1.24	g/L	0.80 - 4.00
IgM	0.76	g/L	0.50 - 2.00
C3	0.96	g/L	0.70 - 1.70
C4	<0.02	g/L	0.18 - 0.58

Normal serum electrophoresis and immunofixation

- (a) In which conditions would you find this pattern of C3 and C4? (5 marks)
- (b) What Immunology tests would you advise? (3 marks)
- (c) What is the most likely diagnosis (1 mark)
- (d) If this diagnosis is correct, what additional condition(s) should be investigated? (1 mark)

ANSWERS:**Question 1**

- a) (small) IgG kappa paraprotein (1 mark)
Normal background immunoglobulins / no immune paresis (1 mark)
No BJP (1 mark)
- b) Calcium (1 mark)
Renal function (1 mark)
Full blood count (1 mark)
- c) MGUS (1 mark)
- d) Repeat testing [6 months / annually] OR refer to Haematology for further assessment.
Mark given as long as the candidate does not consider the results warrant urgent action.

Question 2

- a) Hereditary angioedema (1 mark)
Acquired angioedema (1 mark)
SLE (1 mark)
Two of: (2 marks)
 - Cryoglobulinaemia / immune complex disease
 - Infection
 - C4 null allele
- b) C1 inhibitor concentration (1 mark)
C1 inhibitor function (1 mark)
C1Q concentration (1 mark)
- c) Acquired C1 Inhibitor deficiency (acquired angioedema) (1 mark)
- d) Underlying haematological malignancy / lymphoma (1 mark)