



Australian and New Zealand College of
Veterinary Scientists

Membership Examination

June 2022

Medicine of Cats

Paper 1

Perusal time: **Fifteen (15)** minutes

Time allowed: **Two (2)** hours after perusal

Answer **ALL FOUR (4)** questions

Answer **FOUR (4)** questions, each worth 30 marks total 120 marks

Paper 1: Medicine of Cats

1) Answer **all** parts of this question:

- a) Using Starling's forces describe the aetiopathogenesis of pleural effusion in the following **three (3)** conditions:

Congestive heart failure; Mediastinal neoplasia; Pyothorax (12 marks)

- b) Describe the pathophysiology of aortic thromboembolism, in your answer include reference to Virchow's triad. (10 marks)
- c) Briefly discuss the mechanism of action, one clinical indication and at least **two (2)** potential side effects of Mirtazipine (4 marks)
- d) Briefly discuss the mechanism of action, one clinical indication and at least **two (2)** potential side effects of Meloxicam. (4 marks)

2) Answer **all** parts of this question:

- a) Discuss the pathophysiology of the clinical signs of feline infectious peritonitis. Include in your discussion the differences between wet and dry forms. (20 marks)
- b) Discuss the indications, interpretation and limitations of the following test; Immunofluorescence for FeCoV on body cavity effusion (5 marks)
- c) Discuss the indications, interpretation and limitations of the following test; Polymerase chain reaction for FeCoV in faeces. (5 marks)

3) Answer **all** parts of this question:

- a) Describe the normal physiology of renin-angiotensin-aldosterone system relating to its role in maintenance of systemic blood pressure. (20 marks)

- b) Describe thyroid hormone synthesis and control of thyroid hormone release in a healthy cat. Describe how this differs in a cat with hyperthyroidism. (10 marks)

4) Answer **all** parts of this question:

- a) Explain why a diet consisting solely of cooked chicken breast is not recommended for the feline patient. Include any relevant pathophysiological mechanisms involved in your answer. (4 marks)

- b) Discuss the mode of inheritance, breed(s) affected and likely clinical presentation of polycystic kidney disease. (4 marks)

- c) How is anti-mullarian hormone produced and in what circumstance is testing it indicated? (4 marks)

- d) Describe clinical signs of permethrin toxicity with relation to the underlying pathophysiology (6 marks)

- e) Describe clinical signs of anti-coagulant rodenticide toxicity with relation to the underlying pathophysiology (6 marks)

- f) Describe clinical signs of paracetamol toxicity with relation to the underlying pathophysiology (6 marks)

End of Examination



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Paper 2

Perusal time: **Fifteen (15)** minutes

Time allowed: **Two (2)** hours after perusal

Answer **ALL FOUR (4)** questions

Answer **FOUR (4)** questions, each worth 30 marks total 120 marks

1. Answer **all** parts of this question:

- a. Discuss the limitations for the use of cardiac biomarker n-terminal pro-brain natriuretic peptide (NT-pro-BNP). (5 marks)
- b. Explain and justify the best choice of NT-pro-BNP test (point of care or quantitative) you would use for both a cat presenting for respiratory distress **and** the investigation of an asymptomatic heart murmur in a cat presenting for a routine health exam. (10 marks)
- c. An echocardiogram of a 12-year-old Domestic short hair is performed following detection of a heart murmur at a routine physical examination. The echocardiogram confirms concentric left ventricular hypertrophy.

Explain and justify any further investigations you would need to do on this cat to rule out secondary causes of ventricular hypertrophy. (5 marks)

- d. You have been tasked with revising your clinic's feline vaccination protocol. You live in an area where feline leukaemia virus (FeLV) is endemic.

Taking into consideration current, expert panel recommendations, formulate a protocol for the use of inactivated Feline Leukaemia virus vaccination.

(5 marks)

- e. A colleague seeks your opinion regarding a positive in-house antigen ELISA FeLV test. You live in an area where FeLV is endemic. The cat in question is a four-year-old, female spayed domestic shorthair. She is the sole cat in the household, and lives exclusively indoors. She is a healthy cat and was tested as part of a general health profile screening. She has never been vaccinated against FeLV.

Considering test options and limitations, as well as epidemiological factors, briefly discuss the implications of the positive FeLV antigen test for this cat in these circumstances.

Outline your recommendations for follow-up testing. (5 marks)

2) An eight-year-old female neutered indoor only Ragdoll cat presents for vague signs of illness over the previous month with a mild reduction in appetite and lethargy. The cat has also lost 150g in weight She is fed a mix of premium wet and dry cat foods and is up to date with routine prophylaxis. Physical examination is unremarkable with BCS 4/9 and bodyweight 4.2kg. Blood tests (complete blood count, biochemistry, TT4) and urine analysis reveal the following:

Parameter	Abbreviation	Units	Result	Reference range
Alkaline Phosphatase	ALP	U/L	32	5 - 50
Alanine Transaminase	ALT	U/L	78	19 - 100
Aspartate Aminotransferase	AST	U/L	50	2 - 62
Gamma-glutamyl Transferase	GGT	U/L	3	0 - 5
Total Bilirubin	TBIL	µmol/L	2	0 - 7
Cholesterol	CHOL	mmol/L	5.5	2.2 - 5.5
Urea	UREA	mmol/L	18	5.0 - 15.0
Creatinine	CREA	µmol/L	222	80 - 200
Calcium	CA	mmol/L	3.3	2.1 - 2.8
Phosphorus	PHOS	mmol/L	1.0	1.0 - 2.3
Total Protein	TP	g/L	76	60 - 84
Albumin	ALB	g/L	26	25 - 38
Globulin	GLOB	g/L	42	31 - 52
Albumin:Globulin Ratio	A:G Ratio		0.6	0.5 - 1.1
Glucose	GLU	mmol/L	8.7	3.2 - 7.5
Sodium	Na	mmol/L	144	144 - 158
Potassium	K	mmol/L	3.9	3.7 - 5.4
Chloride	Cl	mmol/L	108	106 - 123
Bicarbonate	HCO ₃	mmol/L	14	12 - 24
Sodium:Potassium Ratio	Na:K Ratio		36	29.0 - 40.0
Anion Gap	AG	mmol/L	22.8	15.0 - 31.0
Total T4	TT4	nmol/L	15	10-60

There is a mild non regenerative anaemia otherwise the CBC and smear area unremarkable.

Parameter	Result	
Collection Method	Cystocentesis	
USG	1.035	
Colour	yellow	
Clarity or Turbidity	clear	
pH	6.0	
Glucose	negative	
Ketones	negative	
Protein	2+	
Bilirubin	negative	
Blood	3+	
Comments: Sediment examination: moderate number of RBC, no WBC or bacteria		

Answer **all** parts of this question:

- a) Interpret the clinical and clinical pathology findings in the context of the clinical presentation and include potential differential diagnoses. (10 marks)

- b) You test ionized calcium and perform thoracic radiographs and abdominal ultrasound. These tests reveal an ionized hypercalcemia (Ionized calcium: 1.62mmol/L (reference range 1.10-1.40mmol)). The thoracic radiographs and abdominal ultrasound are unremarkable apart from some renoliths.

Explain how the ionized hypercalcemia and renoliths relate to the overall clinical picture. (7 marks)

- c) Further blood work was performed which revealed low parathyroid hormone (PTH) levels and an undetectable parathyroid hormone related peptide (PTHrp) and normal Vitamin D. What is the most likely diagnosis based on all the tests performed and clinical findings? Justify your answer. (6 marks)
- d) Describe and justify management options for this case. (7 marks)

3) A young cat presents after a motor vehicle accident. On physical exam the patient is ambulatory, but you find a large soft bladder, flaccid tail, and scuffed nails. You perform a neurological exam, and these are your findings:

Anal Sphincter Tone	Absent
Bulbo-cavernosus Reflex	Absent
Perineal reflex	Absent
Perineal sensation	Absent
Urethral Sphincter tone	Absent, bladder easy to express
Motor/sensory tail function	Absent
HL spinal reflexes / sensation	Normal
HL postural reaction	Normal

a) Classify and justify the neuro-localization based on the clinical signs. (5 marks)

You hospitalise the cat and it fails to urinate on its own and its bladder needs to be expressed.

b) What are the clinical prognostic indicators for the return of bladder function in cats with a tail pull injury. (5 marks)

The same cat above was hospitalised for 2 weeks and his urination normalised in the clinic. He was able to void voluntarily and normally. Bladder function returned to normal and urinalysis and blood work normalised with no evidence of urinary tract infection.

He re-presents 2 weeks after being home. His owners had decided to keep him solely indoors for safety and now the owners report that he is urinating outside the litter box. You suspect that this is a behavioural issue and not a medical issue.

- c) Discuss your advice to the client for non-pharmacological management with specific respect to the cat's unique environmental needs (20 marks)

- 4) A nine-year-old male neutered Burmese presents with a two-week history of progressive inappetence. The owner also reports the cat has been drinking and urinating much more frequently for a few weeks preceding that. In the past 48 hours, he has been vomiting and has progressed to complete anorexia.

On examination, the cat is identified to be 10% dehydrated, very lethargic, and with a rectal temperature of 37.3⁰C.

The following results are obtained from a complete blood count, biochemistry panel and urinalysis:

Parameter	Abbreviation	Units	Result	Reference range
Haematocrit	HCT	L/L	0.50	0.25 - 0.48
Red Blood Cells	RBC	x 10 ¹² /L	9.5	4.9 - 10.0
Reticulocyte %	Retic %	%	0.2	0.0 - 0.4
Reticulocytes ABS	Retic	x 10 ⁹ /L	15	3 - 50
Haemoglobin	Hb	g/L	105	77 - 156
Mean Corpuscular Volume	MCV	fL	43	43 - 55
Mean Corpuscular Haemoglobin	MCH	pg	14	13 - 17
Mean Corpuscular Haemoglobin Concentration	MCHC	g/L	328	282 - 333
White Blood Cells	WBC	x 10 ⁹ /L	14.6	5.5 - 19.0
Neutrophils		x 10 ⁹ /L	12.0	2.0 - 13.0
Bands		x 10 ⁹ /L	0.2	0.0-0.2
Lymphocytes		x 10 ⁹ /L	2.0	0.9 - 7.0
Monocytes		x 10 ⁹ /L	0.1	0.0 - 0.6
Eosinophils		x 10 ⁹ /L	0.3	0.0 - 1.0
Basophils		x 10 ⁹ /L	0.0	0.0 - 0.1
Platelet Count	PLT	x 10 ⁹ /L	Clumped and adequate	
Comments: Many large platelet clumps				

Parameter	Abbreviation	Units	Result	Reference range
Alkaline Phosphatase	ALP	U/L	100	5 - 50
Alanine Transaminase	ALT	U/L	298	19 - 100
Aspartate Aminotransferase	AST	U/L	176	2 - 62
Gamma-glutamyl Transferase	GGT	U/L	5	0 - 5
Total Bilirubin	TBIL	µmol/L	18	0 - 7
Cholesterol	CHOL	mmol/L	5.5	2.2 - 5.5
Urea	UREA	mmol/L	18	5.0 - 15.0
Creatinine	CREA	µmol/L	230	80 - 200
Calcium	CA	mmol/L	2.4	2.1 - 2.8
Phosphorus	PHOS	mmol/L	1.0	1.0 - 2.3
Total Protein	TP	g/L	82	60 - 84
Albumin	ALB	g/L	26	25 - 38
Globulin	GLOB	g/L	48	31 - 52
Albumin:Globulin Ratio	A:G Ratio		0.7	0.5 - 1.1
Glucose	GLU	mmol/L	28.5	3.2 - 7.5
Sodium	Na	mmol/L	144	144 - 158
Potassium	K	mmol/L	2.8	3.7 - 5.4
Chloride	Cl	mmol/L	108	106 - 123
Bicarbonate	HCO ₃	mmol/L	12	12 - 24
Sodium:Potassium Ratio	Na:K Ratio		51.4	29.0 - 40.0
Anion Gap	AG	mmol/L	22.8	15.0 - 31.0
Total T4	TT4	nmol/L	8	10-60
β-hydroxybutyrate		mmol/L	3.0	0 - 0.5

The following results are obtained from a urinalysis.

Parameter	Result	
Collection Method	Cystocentesis	
USG	1.050	
Colour	yellow	
Clarity or Turbidity	clear	
pH	6.0	
Glucose	4+	
Ketones	3+	
Protein	negative	

Bilirubin	1+	
Blood	negative	
Comments: Sediment examination: unremarkable		

Answer **all** parts of this question:

- a) Create a problem list based on this patient's history, clinical examination and laboratory test results. (5 marks)

- b) Interpret the laboratory results of this patient in relation to its presenting problems. Include in your answer your likely diagnosis at this stage. (10 marks)

- c) Describe a rational initial treatment plan (ie. first 24 hours) for this patient (Dosing rates of any medication used is not required). (10 marks)

- d) List and justify any additional diagnostic tests you would recommend for this patient. (5 marks)

END OF EXAMINATION