



Australian and New Zealand College of Veterinary Scientists

Membership Examination

June 2013

Medicine of Horses

Paper 1

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

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

Answer **ALL FOUR (4)** questions

Answer **FOUR** questions each worth 30 markstotal 120 marks

Paper 1: Medicine of Horses

Answer all four (4) questions

1. Compare pituitary pars intermedia dysfunction (PPID) and equine metabolic syndrome (EMS), including current thinking on the aetiological, pathophysiological, epidemiological, diagnostic and treatment aspects. You may use a table in your answer, but do not have to do so. (30 marks)

2. Answer all **three (3)** parts of this question:
 - a) Discuss the use of Hendra virus vaccination. (10 marks)

 - b) Describe the aetiology, pathophysiology, diagnosis and treatment/management of left sided diastolic murmur (grade IV/VI) in a 17-year-old three day eventer. (10 marks)

 - c) Describe the clinical signs and epidemiology of equine influenza (EI) virus. Also describe the prevention of equine influenza virus, both in countries with endemic EI and those that do not have EI. (10 marks)

3. Answer all **three (3)** parts of this question.
 - a) Discuss the treatment of an unvaccinated horse with clinical signs of tetanus. (10 marks)

 - b) Describe the epidemiology, diagnosis and treatment of West Nile virus (Kunjin virus strain) encephalomyelitis in horses in Australia. Describe how to distinguish neurologic signs caused by the Kunjin virus strain from those caused by Hendra virus. (10 marks)

 - c) Discuss the pathogenesis, pathophysiology and treatment of purpura haemorrhagica in a yearling following strangles (*Streptococcus equi*) infection. (10 marks)

Continued over page

4. Answer all **three (3)** parts of this question:

- a) Discuss the pathophysiology and management of persistent mating-induced endometritis in the mare. *(10 marks)*

- b) Discuss the treatment approach to a horse with acute uveitis in one eye that is not associated with ulcerative keratitis. Outline the justification for each part of your approach, including the use and the route of delivery of any drugs administered. *(10 marks)*

- c) For **each** of the following **four (4)** antimicrobial drugs used in equine practice: *(10 marks)*
 - i. Gentamicin sulphate
 - ii. Ceftiofur Na (label dose)
 - iii. Procaine penicillin G
 - iv. Oxytetracycline HCl

list the following:

- class of drug
- bacteriocidal or bacteriostatic
- antimicrobial spectrum (gram-positive, gram-negative, aerobes, obligate anaerobes)
- mechanism of action
- adverse reactions.

End of paper



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Paper 2

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

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

Answer **ALL FOUR (4)** questions

Question 4 c) requires completion of the sepsis score sheet located in the answer booklet you have been provided

Answer **FOUR** questions each worth 30 marks total 120 marks

Medicine of Horses Paper 2

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Paper 2: Medicine of Horses

Answer all four (4) questions

1. You are called out to a six-year-old Thoroughbred gelding which has developed acute fluid diarrhoea. Your colleague saw him last week for a two day old laceration on the left hind limb. The horse was current on his tetanus vaccination status (by your clinic) and received tetanus antitoxin, flunixin meglumine intravenously and was left sufficient medication for a three day course of phenylbutasone (1g BID) and a five day course of oral trimethoprim-sulfa (30 mg/kg BID).

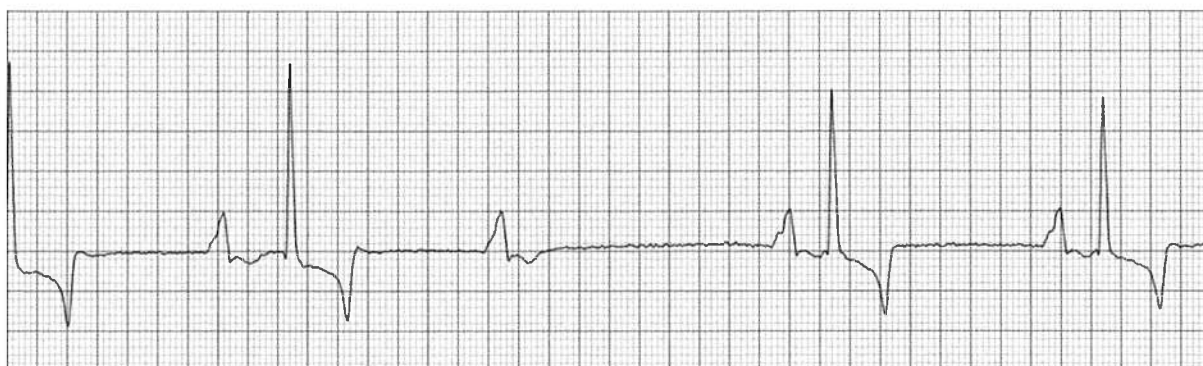
When you examine the gelding his heart rate is 54 bpm, respiratory rate is 16 bpm and temperature is 39.6°C. The mucous membranes are injected and capillary refill time is prolonged at 2.5–3 seconds.

Describe and justify your further clinical examination (if any), and recommendations to the owner/trainer for diagnostics and treatment. i.e. Explain which diagnostic tests and treatments are most crucial to the management of the case, whether any of the treatment plans are controversial and if so, why. (30 marks)

2. The following **three (3)** resting electrocardiograms (ECG) are all from four-year-old Thoroughbred geldings which are being trained in Victoria by different trainers. The trainers are not satisfied with their performance.

For **each** ECG, identify the rhythm and describe the recommendation you would make to the trainer for the management of the horse.

- a) ECG trace one (10 marks)



Lead II, 50mm/s, 20mm/mV

Question 2 continued over page

b) ECG trace two (10 marks)



Base-apex lead, 100mm/s, 20mm/mV

c) ECG trace three (10 marks)



Base-apex lead, 100mm/s, 20mm/mV

Continued over page

3. You have agreed to accompany your local RSPCA inspector to examine a 15-year-old Arabian gelding that is reported to be in very poor body condition. When you arrive at the property you find the gelding in a large paddock with three other adult horses. The gelding has a body condition score of one out of five. The paddock contains what you believe is a significant amount of good quality feed and the other horses are in good body condition (body condition score three out of five).

You perform a thorough physical examination, which reveals the following findings:

- quiet but responsive
- heart rate = 32 bpm, respiratory rate = 12 bpm, rectal temperature = 38.2°C
- oral mucous membranes pink, moist and capillary refill time = 2 seconds
- a small plaque of cool non-painful pitting oedema just caudal to the xiphoid
- multiple crusts over the dorsum of the back and rump areas, giving these areas a 'corrugated' feel
- long toes and large cracks in all four hooves

There are no other significant physical examination findings. You collect blood for routine haematology and biochemistry, and a free catch urine sample for routine urinalysis.

- a) List **four (4)** possible differential diagnoses that you would consider for the cause of the gelding's poor body condition, based on your physical examination. List the most likely causes first. *(4 marks)*
- b) Briefly describe your approach to further investigation of the gelding's weight loss during your initial visit with the RSPCA inspector. Justify your choices on the basis of how they might assist in identifying the aetiology of the gelding's poor body condition. *(6 marks)*

The following day you receive the results of the blood and urine tests from the laboratory.

Question 3 continued over page

The results of the haematology and biochemistry are shown below (assume that all parameters not listed are within normal ranges):

Haematology and Biochemistry:

Test	Result	Normal range
Packed cell volume	18%	32–52
Total plasma protein	56 g/L	58–84
White blood cell count	$7.5 \times 10^9/L$	6.0–13.0
Neutrophil count	$5.0 \times 10^9/L$	2.5–7.0
Lymphocyte count	$2.5 \times 10^9/L$	1.6–3.4
Fibrinogen	5 g/L	2–4
Creatinine	185 $\mu\text{mol/L}$	87–149
Blood urea nitrogen	9.1 mmol/L	3.7–8.2
AST	643 U/L	< 400
GLDH	22.9 U/L	0.9–4.7
GGT	30 U/L	< 36
CK	147 U/L	< 400

- c) Briefly outline your interpretation of the above laboratory results. (6 marks)

The results of the urinalysis are shown below (assume that all parameters not listed are within normal ranges):

Urinalysis:

Test	Result	Normal range
USG	1.020	concentrated > 1.025
Dipstick protein	2+	trace–1+
Dipstick pH	8	7–9
Dipstick blood	negative	negative-trace
Sediment examination	Moderate number of calcium carbonate crystals and occasional granular casts	

- d) Briefly outline your interpretation of the urinalysis results. (3 marks)
- e) Describe how the results of the haematology, biochemistry and urinalysis have altered your differential diagnoses for the gelding's poor body condition and state the **most likely** diagnosis. (6 marks)
- f) Briefly describe your approach to further investigation of the gelding's poor body condition, justifying each step that you plan to take. (5 marks)

Continued over page

4. For the last four weeks you have been managing a late gestational mare with placentitis. The mare foaled last night and had a simple dystocia that required minimal veterinary assistance to successfully expel the foal. The colt foal has a gestational age of 320 days and was weak immediately postpartum and slow to rise. He was given 500 mL of high quality colostrum via nasogastric tube and a prophylactic soapy water enema within an hour of birth. The foal has subsequently nursed from the mare several times but remains dull. It is now about six hours postpartum and the mare has just passed her placenta. Gross examination of the placenta revealed it to be intact, but markedly haemorrhagic and oedematous.

You perform a thorough physical examination of the **foal**, which reveals the following findings:

- recumbent with marked weakness and depression
- heart rate = 80 bpm, respiratory rate = 24 bpm, rectal temperature = 35.5°C
- oral mucous membranes moderately hyperaemic, slightly 'tacky' and capillary refill time = 2 seconds
- moderate sclera injection and occasional petechiae on aural skin
- cold distal extremities

There are no other significant physical examination findings.

You immediately collect blood for routine haematology/biochemistry, blood lactate concentration and serum IgG concentration.

- a) Briefly describe your approach to immediate resuscitation of this foal.

(4 marks)

The results of the blood tests you submitted are shown below (assume that all parameters not listed are within normal ranges):

Haematology:

Test	Result	Normal range
Packed cell volume	45%	30–40
Total plasma protein	80 g/L	55–70
White blood cell count	18.0 x 10 ⁹ /L	5.5–12.5
Neutrophil count	15.5 x 10 ⁹ /L	3.0–7.0
Band neutrophil count	0.5 x 10 ⁹ /L	0.0–0.25
Lymphocyte count	2.0 x 10 ⁹ /L	0.7–2.2

Neutrophils show slight/mild 'toxic' changes.

Question 4 continued over page

Biochemistry:

Test	Result	Normal range
Fibrinogen	7 g/L	2–4
Creatinine	325 µmol/L	90–150
Blood urea nitrogen	13.1 mmol/L	0.7–10.4
Glucose	7.9 mmol/L	4.5–6.3
Lactate	9.3 mmol/L	< 2.0
Serum IgG	3.5 g/L	> 8

- b) Briefly outline your interpretation of the laboratory results above. (8 marks)
- c) Using the historical, physical examination and laboratory information collected so far, complete the sepsis score sheet located in the answer booklet you have been provided. Indicate, in the space provided, the total sepsis score you calculated for this foal. (4 marks)
- d) Based on this score discuss whether the foal is septic, and if so, when the foal became septic (in utero or postpartum) and what information you have to support your hypothesis. (2 marks)
- e) Describe how to confirm whether the foal is septic or not. (2 marks)
- f) Describe your short-term (within the next 24 hours) management of the foal (euthanasia or referral are NOT options). (10 marks)

End of paper

Information collected		4	3	2	1	0	This case
I. CBC 1. Neutrophil count 10 ⁹ /L (not total WBCC)	Record exact #		< 2	2-4 or > 12	8-12	Normal	
2. Band neutrophil count 10 ⁹ /L			> 0.2	0.05-0.2		< 0.05	
3. Doehle bodies, toxic, granulation or vacuolation in neutrophils		Marked	Moderate	Slight		None	
4. Fibrinogen g/L				> 6	4-6	< 4	
II. Other Laboratory Data							
1. Blood glucose mmol/L				< 2.8	2.8-4.4	> 4.4	
2. IgG g/L		< 2	2-4	4-8		> 8	
III. Clinical Examination							
1. Petechiation or scleral injection not secondary to eye disease or trauma			Marked	Moderate	Mild	None	
2. Fever °C				> 39	< 37.8	Normal	
3. Hypotonia, coma, depression, convulsions				Marked	Mild	Normal	
4. Anterior uveitis, diarrhoea, respiratory distress, swollen joints, open wounds			Yes			No	
IV. Historical data							
1. Placentitis, vulvar discharge prior to delivery, dystokia, long transport of mare, mare sick, foal induced, GA>365 days			Yes			No	
2. Prematurity			< 300 days	300-310	311-330	> 330 days	
Total Points							

A score of 11 or higher correctly predicts sepsis 93% of the time. A score of 10 or less correctly predicts non-sepsis 88% of the time.

Modified from: Brewer, B.D. Neonatal Infection. In: Koterba, A.M. et al (eds), Equine Clinical Neonatology, Williams & Wilkins, Baltimore, 1990, page 310.