OCM Case A

OCM CASE: _____ EXAMINERS: _____ CANDIDATE NO. _____

INTRODUCTORY COMMENTS:				
Welcome, my name is MICHAEL HEWETSON and this is SCOTT PIRIE. Before we start, can I confirm that your candidate number is				
Can I confirm whether you want this session to be recorded on videotape			YES	NO
If you do not understand my English or would like your translator to help you answer a question, please tell me and I will approve your translator to help us both				
You have already had a chance to review some information on four cases: we are going to start with case	**A**			
I am going to ask you questions about the cases, and SCOTT will keep notes and make sure we do not run over time				

Slide No.	**Testing Point**	**Examiners Question (modified question & mark deduction)**	**"Point-gaining" Answer Elements**	**Max. no. of points**	**Candidate Points**
Slides 1-5	Identification of clinical problems based on the history and clinical examination	Please list the **clinical problems** identified from the **history** and **clinical examination**	Depression	1	
			Anorexia	1	
			Pyrexia	1	
			Tachycardia	1	
			Decreased borborygmi	1	
			Mild abdominal pain (colic)	1	
			Dependent oedema	1	
			Excessive bleeding from venipuncture site	1	
			Petechial and ecchymotic haemorrhages	1	
Slides 1-5	Interpretation of clinical problems identified from the history and clinical examination	This horse had the following clinical problem " ********** " – could you tell me what **pathophysiological mechanism/s** could explain this problem in the horse and give me at least **one** example of a disease or disorder which would typify each of these	**Pyrexia (examiner prompt)**		
			Non-infectious inflammatory causes e.g. acute hepatic necrosis; foreign bodies etc.	2	
			Infection e.g. Streptococcus equi; septic peritonitis; EHV etc.	2	

		mechanisms **NOTE**: question is focused on pathophysiological mechanisms of disease and formulation of differential diagnoses. The answers do not necessarily need to be related to this case	Neoplasia e.g. lymphoma; myeloproliferative diseases etc.	2	
			Immunological reaction e.g. IMHA; purpura haemorrhagica etc.	2	
			Possible drug reaction e.g. sulphonamides etc.	2	
			Dependent oedema (examiner prompt)		
			Decreased oncotic pressure e.g. hypoproteinemia associated with IBD; cyathostomiasis; CRF etc.	2	
			Increased vascular permeability e.g. vasculitis associated with purpura haemorrhagica; AHS; EVA etc.	2	
			Decreased lymphatic drainage e.g. pleural effusion; neoplasia; udder development etc.	2	
			Increased hydrostatic pressure e.g. congestive heart failure; pericardial effusion etc.	2	
			Haemorrhagic diathesis (examiner prompt)		
			Abnormalities of primary haemostasis e.g. thrombocytopenia; defects of platelet function; vasculitis etc.	2	
			Abnormalities of secondary haemostasis e.g. inherited and acquired coagulopathies etc.	2	
Slides 1-5	Formulation of differential diagnosis list	Based upon the list of problems that you have identified from the history and the physical examination, what are the most important **differential diagnoses** that you would consider for this case? Please justify your choices. *The examiner may ask about findings that*	**Peritonitis**	2	
			Pyrexia	1	
			Depression	1	
			Anorexia	1	
			Tachycardia	1	
			Decreased borborygmi	1	
			Mild abdominal pain	1	
			Ventral oedema	1	

		are inconsistent with certain diagnoses	*Haemorrhagic diathesis is not a consistent feature of peritonitis unless the horse has concurrent DIC*	1	
			Purpura haemorrhagica	2	
			Pyrexia	1	
			Depression	1	
			Anorexia	1	
			Petechial and ecchymotic haemorrhages	1	
			Dependent oedema	1	
			No recent history of respiratory infection e.g. Streptococcus equi subspecies equi, EHV or influenza)	1	
			DIC	1	
			Petechial and ecchymotic haemorrhages	1	
			Excessive bleeding from venipuncture site	1	
			Immune-mediated thrombocytopenia and other causes of thrombocytopenia e.g. myeloproliferative disease	2	
			Pyrexia	1	
			Petechial and ecchymotic haemorrhages	1	
			Excessive bleeding from venipuncture site	1	
			Equine infectious anaemia (EIA)	2	
			Pyrexia	1	
			Depression	1	
			Anorexia	1	
			Dependent oedema	1	
			Petechial and ecchymotic haemorrhages	1	
			No recent history of transport or new animals on the property	1	
			Equine granulocytic ehrlichiosis	2	
			Pyrexia	1	
			Depression	1	
			Anorexia	1	
			Dependant oedema	1	

			Petechial and ecchymotic haemorrhages	1	
			Horse is willing to move comfortably; no ataxia or clinical evidence of ataxia	1	
			Equine viral arteritis (EVA)	2	
			Pyrexia	1	
			Depression	1	
			Anorexia	1	
			Dependant oedema	1	
			Petechial and ecchymotic haemorrhages	1	
			No respiratory signs (conjunctivitis, rhinitis, nasal or ocular discharge) and no recent history of transport or new animals on the property	1	
			Others e.g. neoplasia	2	
Slides 1-5	Diagnostic plan	What **ancillary diagnostic tests** would you like to perform at this point? Please justify your choices.	Abdominocentesis and peritoneal fluid analysis/bacterial culture to rule out peritonitis	2	
			Skin biopsy to rule out purpura haemorrhagica	1	
			Platelet count and function; PT; PTT; activated clotting time; plasma AT III concentration and FDP assay to rule out DIC	6	
			Platelet count; antiplatelet factor 3 test and/or antiplatelet antibody test to rule out immune mediated thrombocytopenia. In the absence of an antiplatelet factor 3 test and/or antiplatelet antibody test, a presumptive diagnosis of IMTP may be made in horses with a low platelet count, normal PT, PTT and no evidence of DIC	4	
			Agar gel immunodiffusion (AGID or Coggins) test or C-ELISA test to rule out EIA	2	

			Identification of characteristic morulae in cytoplasm of neutrophils and eosinophils on examination of a blood smear; whole blood for PCR ; and paired serology to rule out equine granulocytic ehrlichiosis	3	
			Nasopharyngeal or conjunctival swabs for viral isolation and PCR; and paired serology to rule out EVA	3	
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Slide 6	Interpretation of peritoneal fluid analysis	Please comment on the peritoneal fluid analyses results? **NOTE:** candidate needs to comment on peritoneal fluid colour; turbidity; total protein and WBC and use this information to make a diagnosis of peritonitis	Orange turbid fluid; elevated WBC and elevated total protein confirms peritonitis	5	
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Slide 7	Identification and interpretation of peritoneal fluid cytology	Please identify the cells on the slide and interpret your findings in relation to this case. **NOTE:** candidate needs to identify all cell types on the slide and comment on the presence of intracellular bacteria.	Cells identified include neutrophils with intracellular coccoid bacteria; reactive macrophages and blast cells	4	
			Blast cells indicate the presence of a neoplastic process	1	
			Neutrophils with intracellular bacteria indicate a septic process	1	
			Reactive macrophages indicate an inflammatory process	1	
MOVE TO NEXT SLIDE					
Slide 8	Additional information	Provide candidate with results of other ancillary diagnostics tests that he or she has requested.			

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Slide 9	Identification and interpretation of the complete blood count (CBC)	Please list the problems identified from the results of a complete blood count (CBC) and interpret each one individually in relation to this case. *Please indicate if you require further diagnostic tests to aid in your interpretation of the clinicopathological data* IN THIS CASE …….>	**Mild normocytic normochromic anaemia**	3	
			<u>Anaemia may be caused by</u>:		
			(1) Blood loss e.g. splenic haematoma	1	
			(2) Haemolysis e.g. IMHA	1	
			(3) Decreased red cell production e.g. anaemia of chronic disease, myelophthisis, aplastic anaemia or myelosuppressive drugs	1	
			In this case, the anaemia is mild, and is most likely due to anaemia of chronic disease; however the presence of a pancytopenia should alert you to the possibility of a bone marrow problem affecting myelopoiesis.	2	
			Request a bone marrow biopsy	1	
			Low grade haemolysis is possible due to concurrent hyperbilirubinemia.	3	
			Request an in-saline agglutination test and/or a Coombs test to rule out IMHA	2	
			Blood loss anaemia is unlikely as there is no evidence of excessive haemorrhage	1	

			Leukopenia secondary to mature neutropenia without a left shift and some evidence of toxic changes	4	
			<u>Neutropenia may be caused by</u>: (1) increased tissue demand for neutrophils which exceeds bone marrow production in cases of peracute inflammation or infection e.g. acute bacterial, viral or protozoal infection (2) sequestration neutropenia (margination of neutrophils in small vessels secondary to severe endotoxemia) e.g. acute colitis (3) decreased neutrophil production e.g. myelophthisis, idiopathic pancytopenia or myelosuppressive drugs	 1 1 1	
		IN THIS CASE ……>	The leukopenia and mature neutropenia in this case suggest a peracute inflammatory response, probably due to the peritonitis, however the absence of either a regenerative or degenerative left shift or mature neutrophilia in relation to the peritonitis leads one to suspect an underlying bone marrow problem affecting myelopoiesis *Request a bone marrow biopsy*	2 1	
			The toxic morphology of the neutrophils is compatible with a bacterial infection	1	
			Thrombocytopenia	1	

			Thrombocytopenia may be caused by: (1) sequestration e.g. splenomegaly (2) ineffective platelet production e.g. myelophthisis, idiopathic pancytopenia or myelosuppressive drugs (3) increased platelet destruction e.g. IMTP, infectious diseases or drug reactions (4) Increased platelet consumption e.g. recent haemorrhage, thrombosis or DIC (5) EDTA dependent pseudothrombocytopenia	1 1 1 1 1	
		IN THIS CASE ……>	In this case a negative antiplatelet antibody test and the absence of antibodies against EIA and Anaplasma phagocytophilum rules out increased platelet destruction	3	
			Excessive consumption of thrombocytes is unlikely as there is no evidence of DIC, thrombosis or excessive haemorrhage.	3	
			The most likely cause of thrombocytopenia in this case is a bone marrow problem affecting the megakaryocyte *Request a bone marrow biopsy*	1 1	

Slide 9	Identification and interpretation of the serum biochemical profile	Please list the problems identified from the results of the serum biochemical analysis and interpret each one individually in relation to this case *Please indicate if you require further diagnostic tests to aid in your interpretation of the clinicopathological data* IN THIS CASE ……>	**Hyperbilirubinemia**	1	
			<u>Hyperbilirubinemia may be caused by</u>: (1) Haemolysis (unconjugated bilirubin) e.g. IMHA (2) Liver failure (conjugated and unconjugated bilirubin) e.g. pyrrolizidine alkaloid toxicity (3) Post hepatic obstruction (conjugated bilirubin) e.g. cholelithiasis (4) Anorexia associated with systemic disease (unconjugated bilirubin)	2 2 2 2	
			Low grade haemolysis is possible due to concurrent anaemia. *Request an in-saline agglutination test and/or a Coombs test to rule out IMHA*	1 1	
			Liver failure is unlikely as bile acids are within normal range	1	
			In this case the majority of the bilirubin is conjugated, which rules out post hepatic obstruction.	1	
			The most likely cause of hyperbilirubinemia in this case is anorexia secondary to acute septic peritonitis and a suspected underlying neoplastic process	1	
			Hyperfibrinogenemia	1	
			Hyperfibrinogenemia is an acute phase protein and is elevated in response to infection, inflammation and neoplasia	4	

		IN THIS CASE ……>	In this case the elevation in fibrinogen is due to septic peritonitis and a suspected underlying neoplastic process	1	
			Elevation in SDH (sorbitol dehydrogenase)	1	
			SDH is a liver specific enzyme. Elevations in SDH indicate acute hepatocellular damage. The half life of SDH is short, so elevations in SDH indicate acute ongoing liver damage	3	
		IN THIS CASE ……>	In this case the elevation in SDH is not immediately clear, although absorption of bacteria and toxins from the peritoneal cavity via the portal circulation may cause liver damage. *Request a liver biopsy*	2 1	
			Elevation in AST (aspartate aminotransferase)	1	
			AST is a non-specific indicator of tissue damage and is most commonly elevated with liver damage or muscle necrosis	3	
		IN THIS CASE ……>	In this case, muscle necrosis is unlikely as CK is normal, suggesting that the elevation in AST (in combination with SDH) is most likely associated with liver damage	2	
Slides 1-9	Formulation of a treatment plan	What general therapeutic aims would you consider in this case at this stage? Please justify your choices	Intravenous polyionic fluids to maintain hydration; avoid electrolyte imbalances; and avoid renal tubular damage due to the administration of potentially nephrotoxic drugs during treatment	3	

		NOTE: the candidate is expected to outline general therapeutic aims for treating septic peritonitis and thrombocytopenia and justify their choices	NSAID's for their local and systemic anti-inflammatory effects (e.g. flunixin meglumine)	1	
			Intravenous antibiotics ideally based upon results of bacterial culture and sensitivity testing. A combination of a β- lactam antibiotic and an aminoglycoside is a reasonable first choice due to their synergistic effect and ability to provide a broad spectrum of activity against a variety of gram positive and gram negative aerobic and anaerobic bacteria. Metronidazole can be added due to the possibility of *Bacteroides fragilis* which is resistant to penicillin.	2 3 2	
			Peritoneal lavage or drainage to remove toxic bacterial byproducts, products of inflammatory cells, and to reduce the likelihood of adhesions.	3	
			Heparin to reduce the likelihood of adhesions	1	
			Platelet rich plasma to replenish thrombocytes and prevent life threatening haemorrhage	1	
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Slide 10	Additional information	Provide candidate with information about therapy and case progression			
Slide 11	Recognition of further clinical complications	Please interpret the complete blood count (CBC) on day 2	The repeat CBC indicates a persistent thrombocytopenia, mild anaemia, and a remarkable increase in the WBC	3	

			The primary WBC type is an abnormal blast cell, confirming a leukaemia	1	
			Fibrinogen concentration has also increased when compared to the previous day, suggesting ongoing inflammation	1	
Slides 10-11	Formulation of an updated differential diagnosis list	Based upon the list of problems that you have identified from the CBC on day 2, please formulate an updated list of differential diagnoses for this case *The examiner may ask about findings that are inconsistent with certain diagnoses*	Leukaemia (lymphoproliferative or myeloproliferative disorder affecting the bone marrow) with secondary septic peritonitis and thrombocytopenia	3	
			Lymphoma with a leukaemic phase and secondary septic peritonitis *Lymphoma does not affect the bone marrow and would not cause a thrombocytopenia unless it was associated with IMTP or DIC*	2 1	
Slides 10-11	Formulation of a further investigative plan	How might you further investigate this case?	Bone marrow biopsy or aspirate	1	
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Slide 12	Interpretation of the bone marrow aspirate	Please interpret the results of the bone marrow aspirate and comment on which immunohistochemical and cytochemical staining techniques could be used to further classify the blast cells	29% of the cellular matrix of the bone marrow consists of blast cells, confirming leukaemia	1	
			Antibody labeling (CD3, CD79a) to determine if the cells are from the lymphoid or the myeloid line	1	
			Serum lysozyme (muramidase) to confirm if the cells are neutrophils or monocytes	1	

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Slide 13-14	Formulation of a prognosis	Please comment on the prognosis for this horse	Grave prognosis. Recommend euthanasia	1	
			Point total	215	
Thank you					
Conversion Factor = candidate point no / 217 (i.e. total point number) * 100 = grade out of 100					

Summary of points awarded

Identifying problems clinical & lab problems as listed	(%)
Ability to regurgitate information available on slides	(%)
Clinical data interpretation	(%)
Lab data interpretation	(%)
Interpretation of diagnostic information	(%)
Differential Diagnosis	(%)
Diagnostic Plan	(%)
Therapeutic Plan	(%)
Disease-specific knowledge	(%)
Knowledge of disease & case management	(%)