2011 ACVP Certifying Examination In Clinical Pathology

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2011 Clinical Pathology Examination

- This show will present examples of glass slides, projected images and answer keys from the 2011 ACVP Certifying Examination in Clinical Pathology:
  - Hematology
  - Cytology and Surgical Pathology
- Further details and information on other sections are found on the ACVP website

Hematology 2011: Glass Slides

- 10 slides in 2 hours
  - ~12 minutes / slide
  - Each flat of slides shared by 2 candidates
  - Information given: species and specimen type
    - Example: Canine blood smear
  - Worth 40 % of total hematology section
    - Projected images 20 %
    - Multiple choice 40 %

Hematology 2011: Glass Slides

- In 2011:
  - 8 blood smears, 2 bone marrows
  - Species:
    - 7 canine
    - 1 feline
    - 1 avian (chicken)
    - 1 ruminant (bovine)

Hematology Glass Slides

- Provide a morphologic description:

  "Must provide the reader with a clear, concise description of pertinent qualitative and quantitative findings."

- Provide an interpretation:

  "As specifically as possible, provide any of the following that appear applicable to each case:

  - Diagnosis of disease or process
  - Differential diagnosis
  - Potential etiologies
  - Additional tests you would recommend"

Hematology Glass Slides – General Examples (not specifically from 2011)

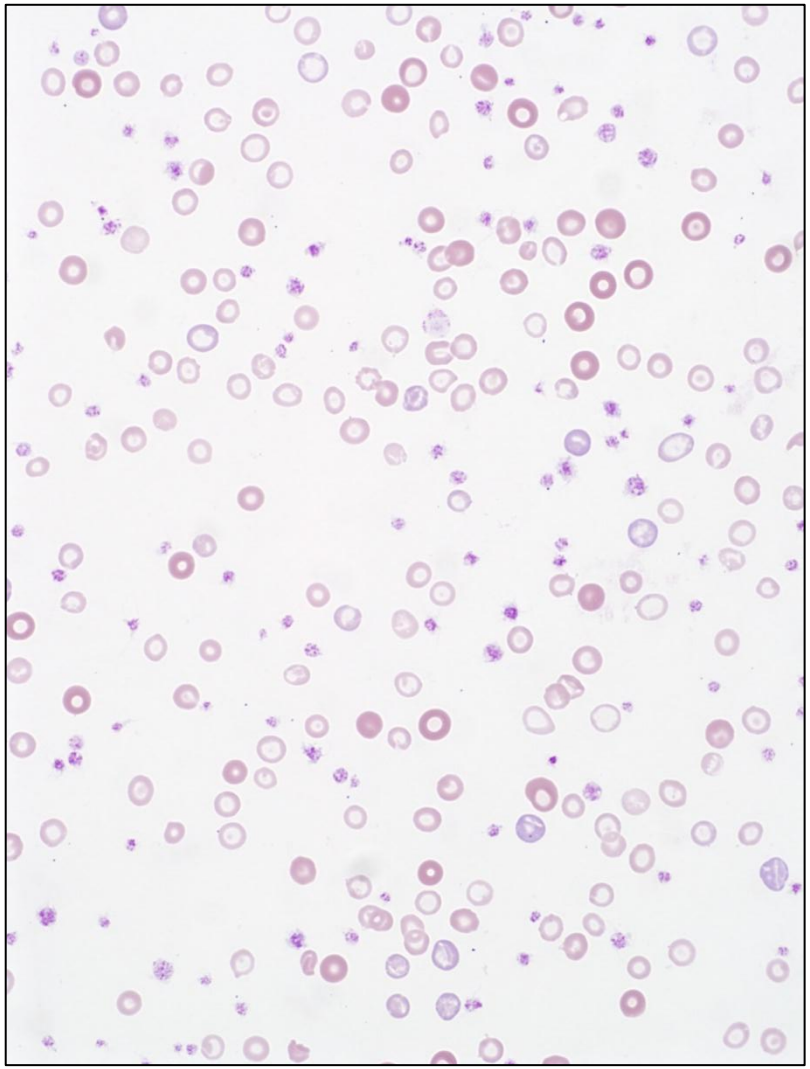
- Diagnosis of disease or process
  - Non-regenerative anemia
- Differential diagnosis
  - Severe chronic inflammation vs. chronic myelogenous leukemia
- Potential etiologies
  - *Theileria* vs. *Babesia*
- Additional tests you would recommend
  - PCR, flow cytometry

Hematology Glass Slides

- Can be in point form
- Be consistent and include information on all cell lineages
- Emphasize abnormal findings
- Cover normal briefly as part of full description
- No requirement for exact platelet or WBC estimates or 100 cell differential – describe in general terms
- Each case usually worth ~20 points
  - ~ 12 - 15 points for description & organization
  - ~ 5 - 8 points for interpretation and additional tests

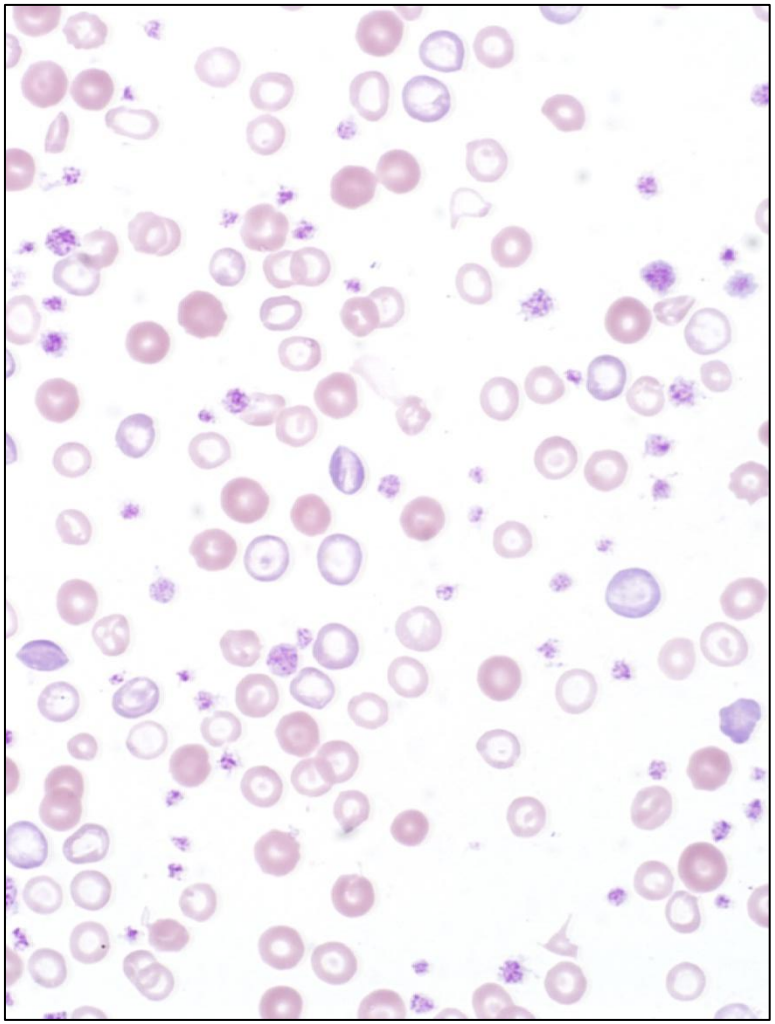
2011 Hematology Glass Slides Example # 1

- Canine blood smear
- Monolayer has a decreased red blood cell density consistent with anemia



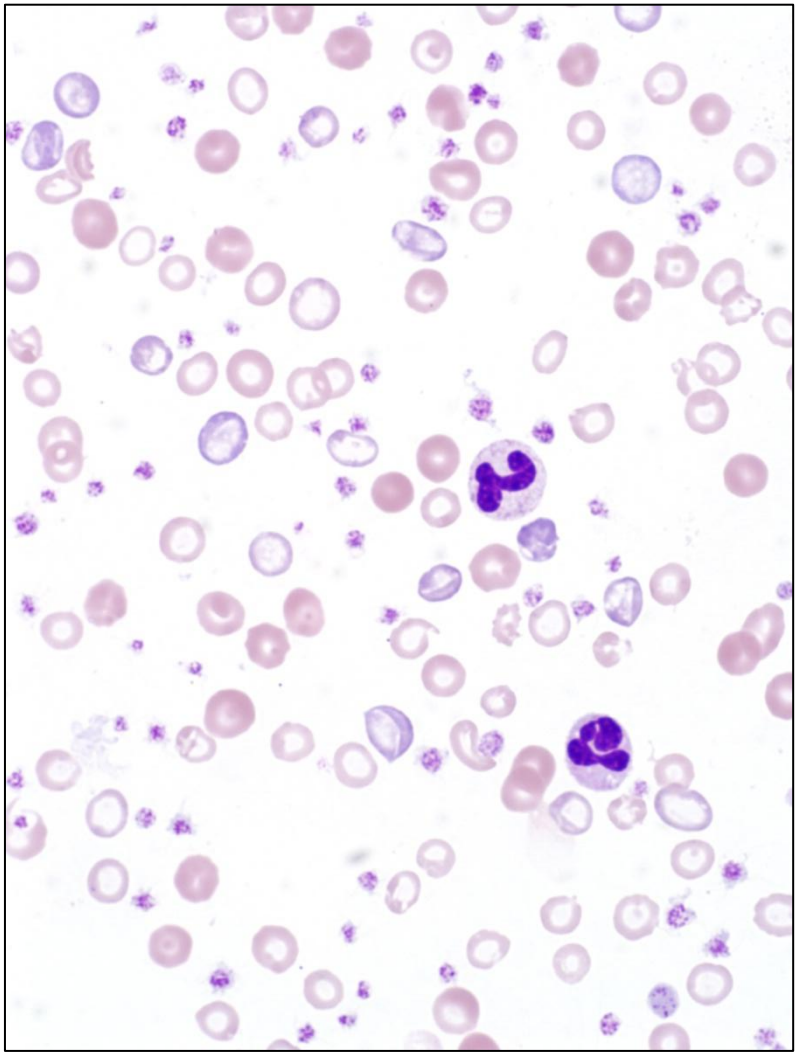
2011 Hematology Glass Slides Example # 1

- Increased polychromatophils
- Microcytosis
- Hypochromasia
- Occasional schistocytes



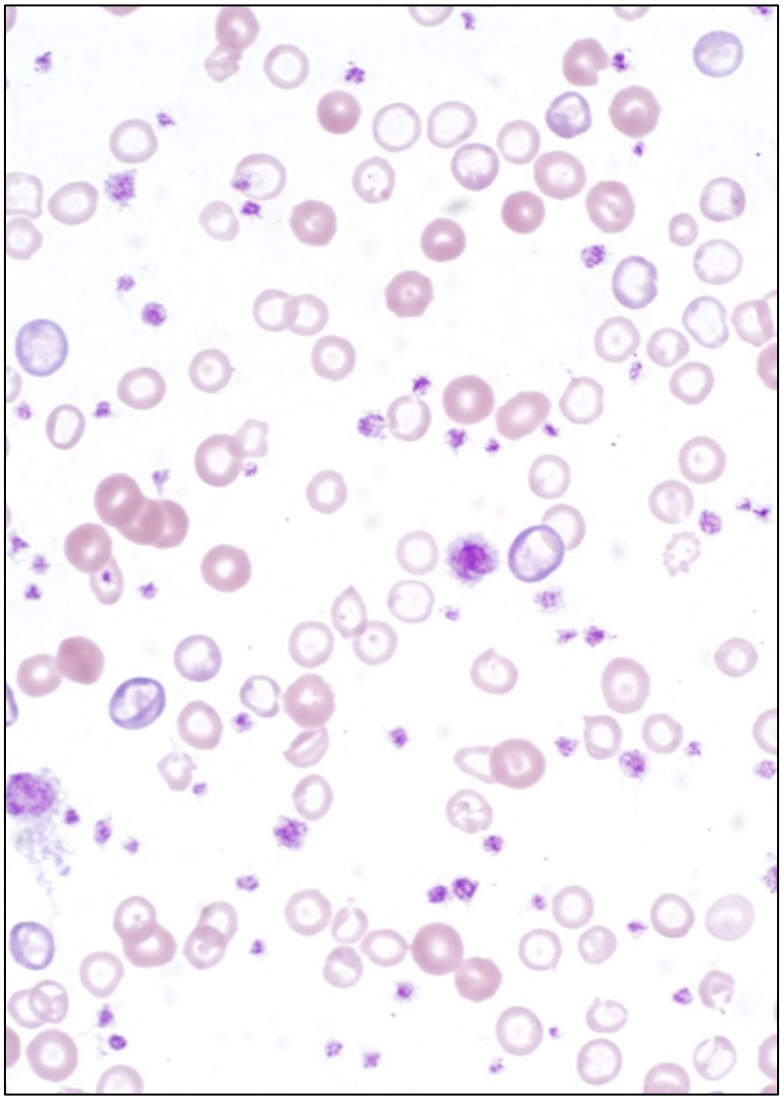
2011 Hematology Glass Slides Example # 1

- Leukocyte #s within normal limits
- Most are segmented neutrophils
- Low #s of bands
- Rest are lymphocytes & monocytes
- Mild toxic change



2011 Hematology Glass Slides Example # 1

- Thrombocytosis present
- Accept mild or moderate
- Most have normal morphology
- Occasional giant platelets seen



2011 Hematology Glass Slides Example # 1

- Anemia is markedly regenerative and has features most consistent with iron deficiency
- Inflammation is present
- Thrombocytosis – consider possible causes
- Further testing for iron status and causes of hemorrhage

2011 Hematology Glass Slides Example # 1

Description	Points
ERYTHRON	
Marked increase in intercellular space indicating severe anemia	1.0
Increase in polychromatophils	1.0
Anemia is microcytic	1.0
Anemia is hypochromic	2.0
Occasional schistocytes	0.5
Rare nucleated RBCs	0.5
LEUKON	
Numbers appear within normal limits	1.0
Majority are segmented neutrophils	1.0
Low numbers of bands	0.5
Very mild toxic change	0.5
Remaining leukocytes mainly monocytes (0.5) & lymphocytes (0.5)	1.0
Occasional lymphocytes are reactive – not consistent across smears	-
Rare eosinophils – not all candidates will see	-
PLATELETS	
Thrombocytosis (accept mild or moderate)	1.0
Occasional giant forms seen	0.5

2011 Hematology Glass Slides Example # 1

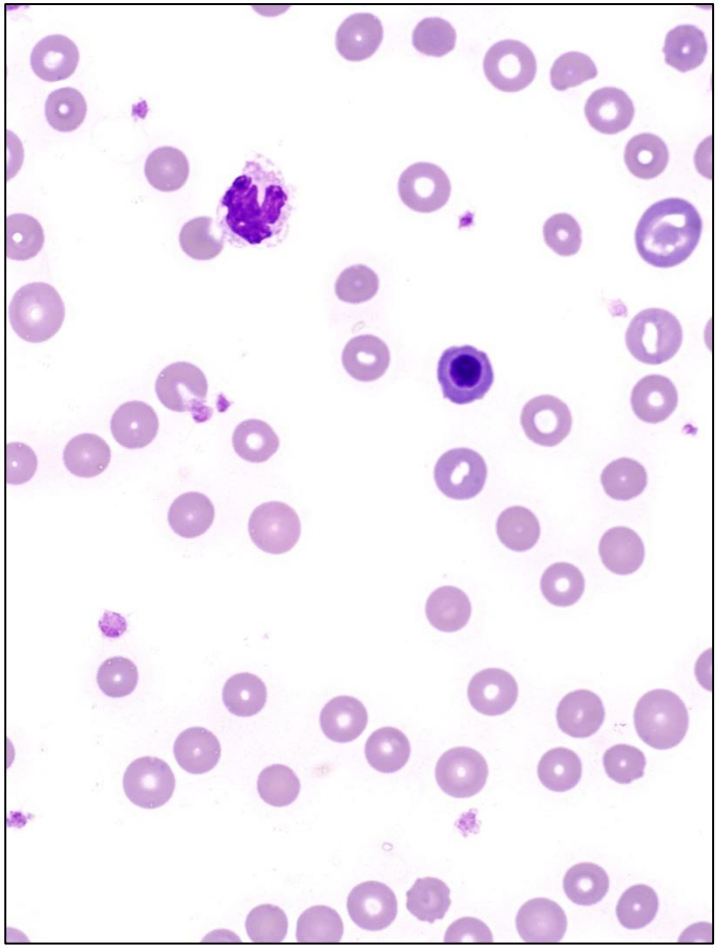
Interpretation	Points
Markedly regenerative anemia	1.0
Most consistent with iron deficiency	2.0
Inflammation	1.0
Explanation for thrombocytosis (list at least 2 possibilities for full marks): - reactive thrombocytosis (inflammation related) - response to increased demand - associated with iron deficiency - excitement (accept epinephrine release or splenic contraction) may be contributory but not full explanation	1.5

Comments / Additional tests	
Reasonable tests for blood loss and iron deficiency – could include: Clinical evaluation for signs of hemorrhage (hematuria, melena, etc) Evaluate protein concentration to support hemorrhage Assays to assess coagulation Tests for iron status (such as iron or ferritin concentration)	3.0

Total Points	20

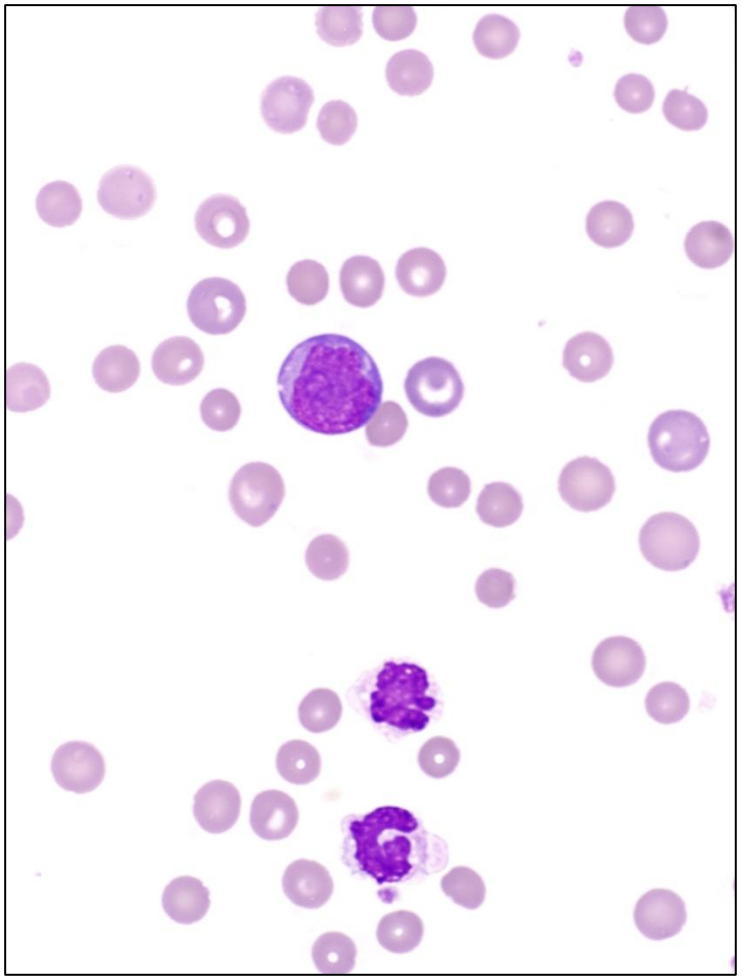
2011 Hematology Glass Slides Example # 2

- Canine blood smear
- Marked decreased in RBC density consistent with anemia



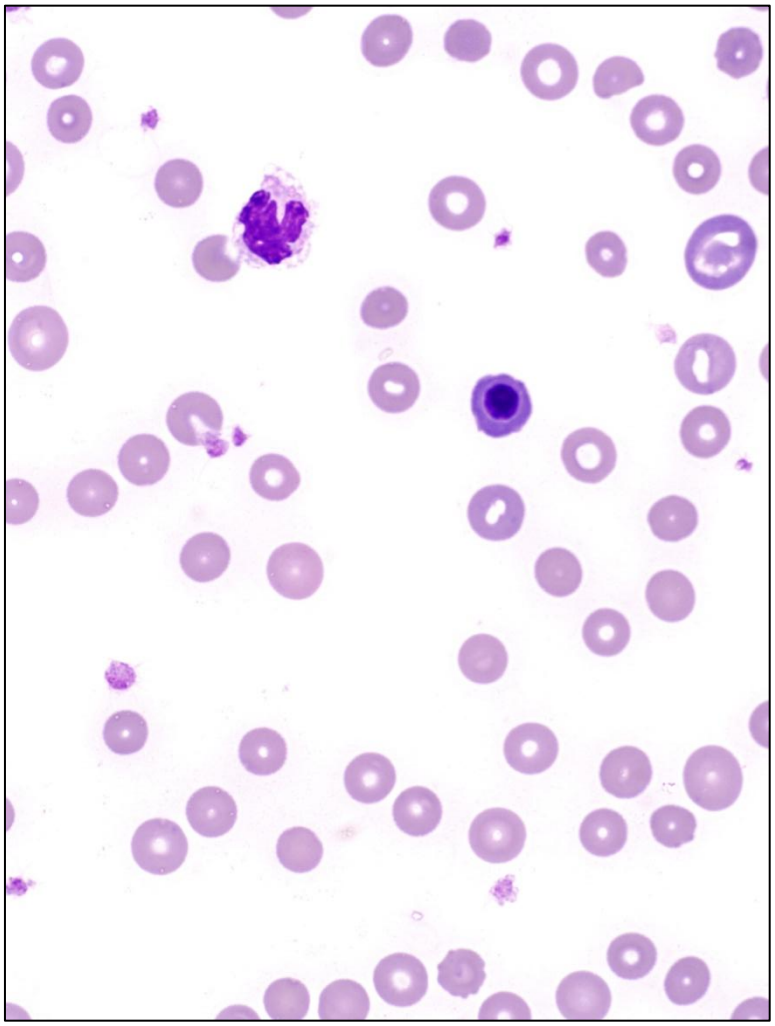
2011 Hematology Glass Slides Example # 2

- Occasional polychromatophils
- Moderate anisocytosis
- Low #s of spherocytes



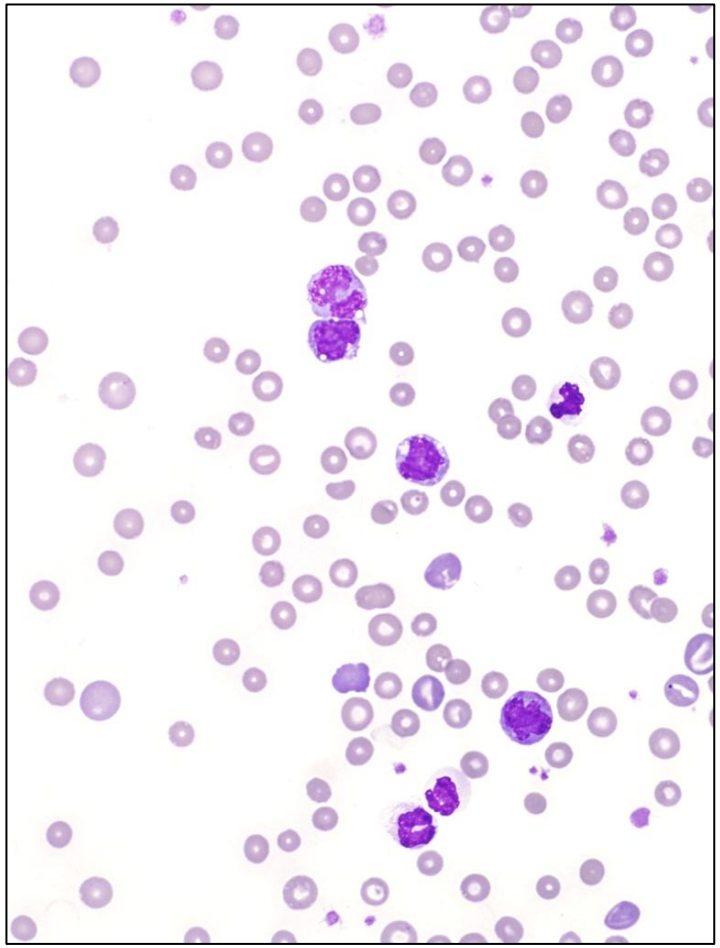
2011 Hematology Glass Slides Example # 2

- Slight hypochromasia
- Occasional target cells
- Rare metarubricytes



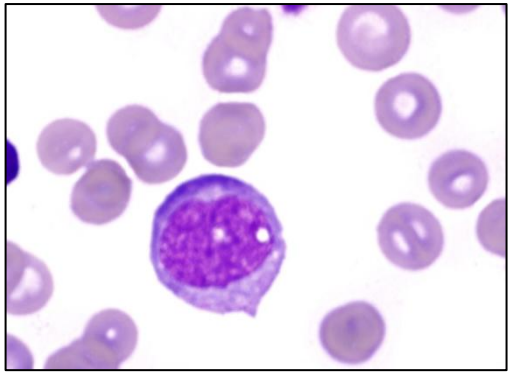
2011 Hematology Glass Slides Example # 2

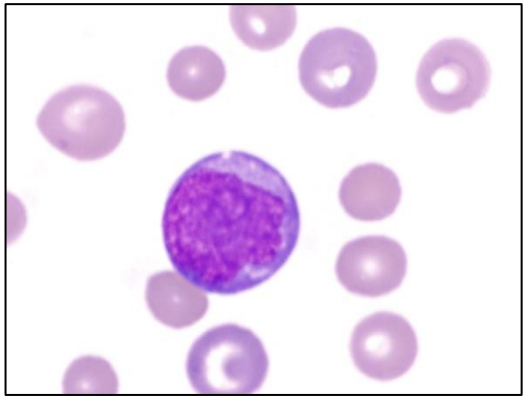
- Leukocyte #s increased
- Mainly segmented neutrophils
- Occasional bands
- Occasional Dohle bodies & vacuolation
- ~40 % of cells are atypical

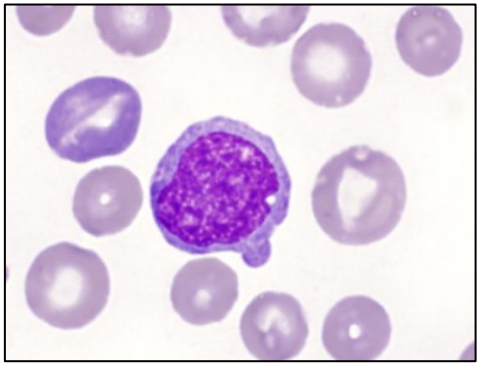


2011 Hematology Glass Slides Example # 2

- Description of atypical cells:
- Large
- Round
- Immature
- Moderate amount of basophilic cytoplasm
- Occasional clear punctate vacuoles







2011 Hematology Glass Slides Example # 2

- Futher atypical cell description:
  - Large nuclei
  - Nuclei indented to amoeboid to ribbon shaped
  - Chomatin – coarsely reticular to stippled
  - Rare cells – faint pink granules
- Platelets slightly decreased
- Rare shift (giant) platelets

2011 Hematology Glass Slides Example # 2

- Insufficient regenerative response
- Spherocytes consistent with immune mediated hemolysis
- Inflammation with toxic change
- Immature hemic cells suggest acute myeloid / monocytic leukemia
- Can’t rule out atypical severe inflammation
- Additional tests:
- Flow cytometry or immunophenotyping

2011 Hematology Glass Slides Example # 2

Description	Points
ERYTHRON	
Marked decreased in RBC density (0.5) consistent with anemia (0.5)	1.0
RBC morphology:	
Moderate anisocytosis	0.5
Occasional polychromatophils	0.5
Low #s of spherocytes	1.0
Occasional target cells	0.5
Slight hypochromasia	0.5
Rare basophilic stippling	0.5
Rare metarubricytes	0.5
LEUKON	
WBC # markedly increased (estimate was 80,000/ul but # not required)	1.0
Segmented neutrophils predominate	1.0
Occasional bands	0.5
Occasional Dohle bodies (0.5) and vacuolation (0.5)	1.0
~40 % of cells are atypical	1.0

2011 Hematology Glass Slides Example # 2

Description	Points
LEUKON, continued	
Description of atypical cells:	
Large (or give indication of size)	0.5
Round (some shape description)	0.5
Immature (some reference to degree of maturation)	0.5
Moderate amount of basophilic (0.5) cytoplasm (0.5)	1.0
Occasional clear punctate vacuoles	0.5
Nuclei are large (or size estimate)	0.5
Nuclear shape – indented to amoeboid to ribbon shaped	0.5
Chromatin - coarsely reticular to stippled	0.5
Rare cells contain faint pink granules	0.5
PLATELETS	
Slightly decreased # (estimate was 150,000/ul – not required to give)	0.5
Rare shift platelets – may be noted	-

2011 Hematology Glass Slides Example # 2

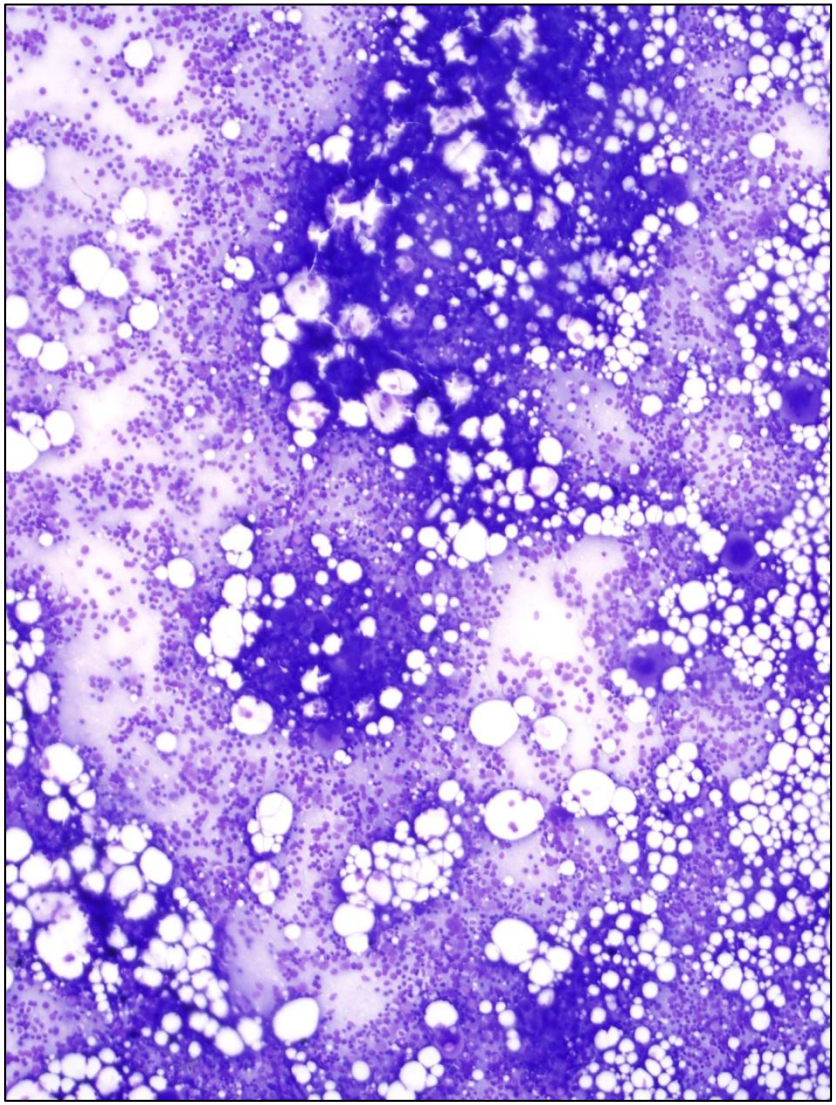
Interpretation	Points
Anemia (point for anemia earlier) has insufficient regenerative response	1.0
Spherocytosis consistent with immune-mediated hemolysis	1.0
Inflammatory leukogram (0.5) with toxicity (0.5)	1.0
Immature hemic cells suggestive of acute myeloid / monocytic leukemia	1.0
Cannot rule out atypical severe inflammatory response	0.5
Mild thrombocytopenia – consumption, destruction, decreased production	-

Comments / Additional tests	Points
Flow cytometry, immunophenotyping (accept either)	0.5

Total Points	20

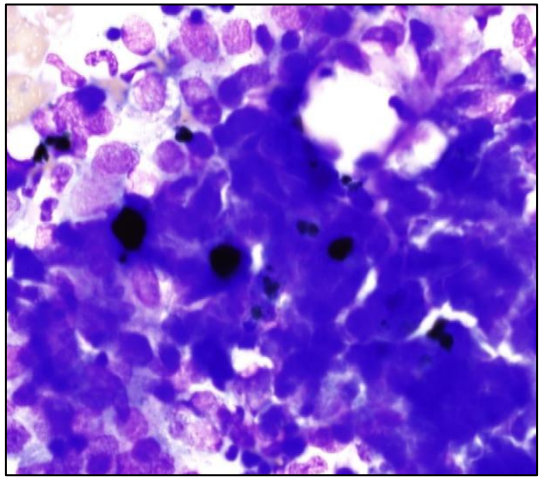
2011 Hematology Glass Slides Example # 3

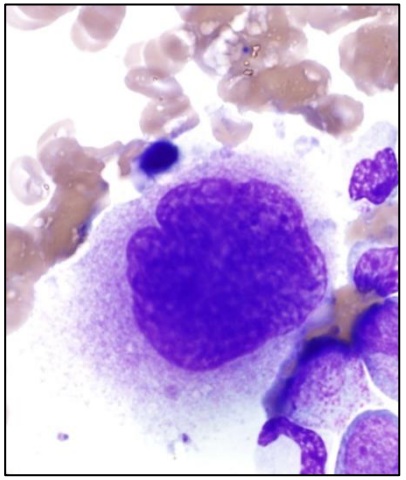
- Canine bone marrow aspirate
- Highly cellular
- Background – blood & lipid vacuoles
- Unit particles normal to hypercellular

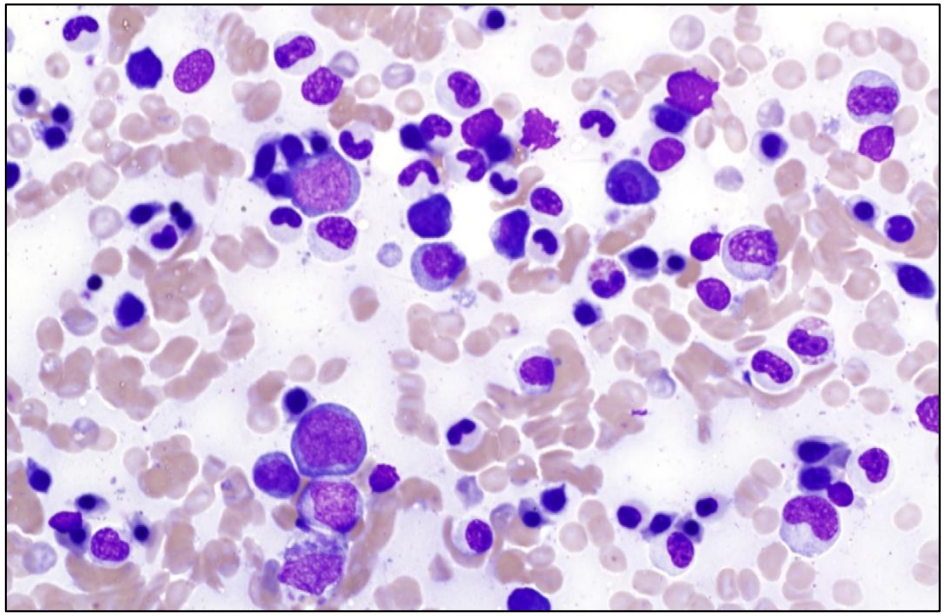


2011 Hematology Glass Slides Example # 3

- Iron – small to moderate amount
- M/E ratio – mildly ↓ - rough estimate (~1:2)
- Megakaryocytes – normal to mildly increased, some immature forms, morphology WNL

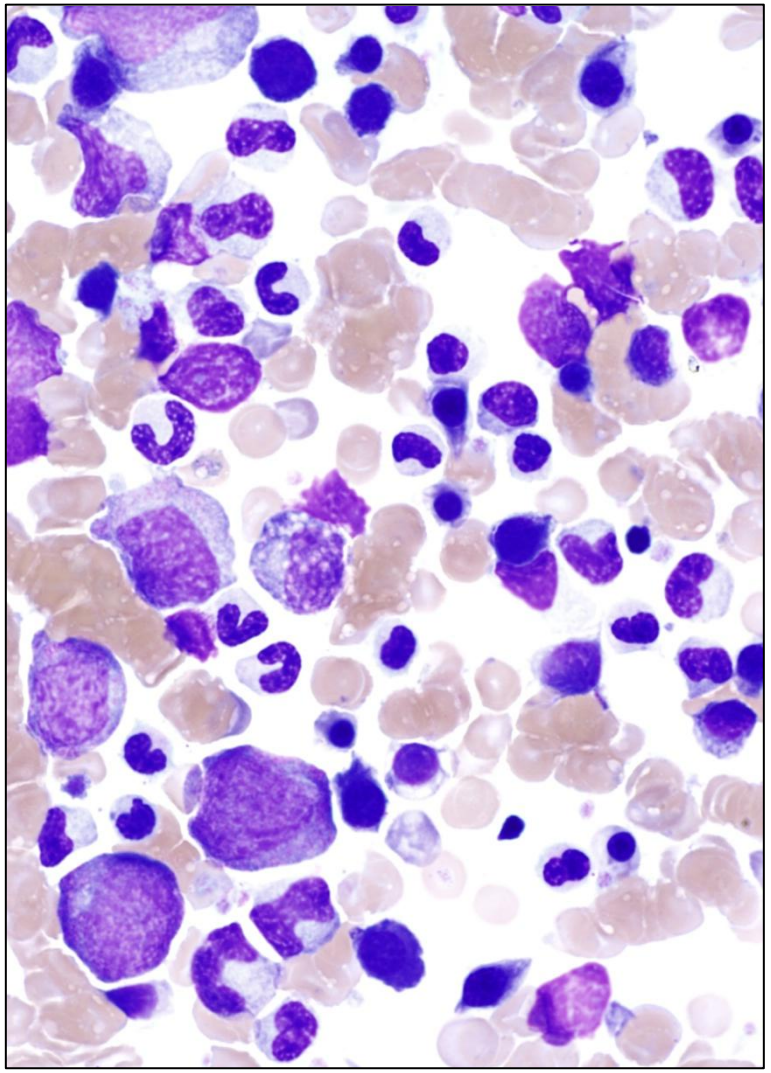






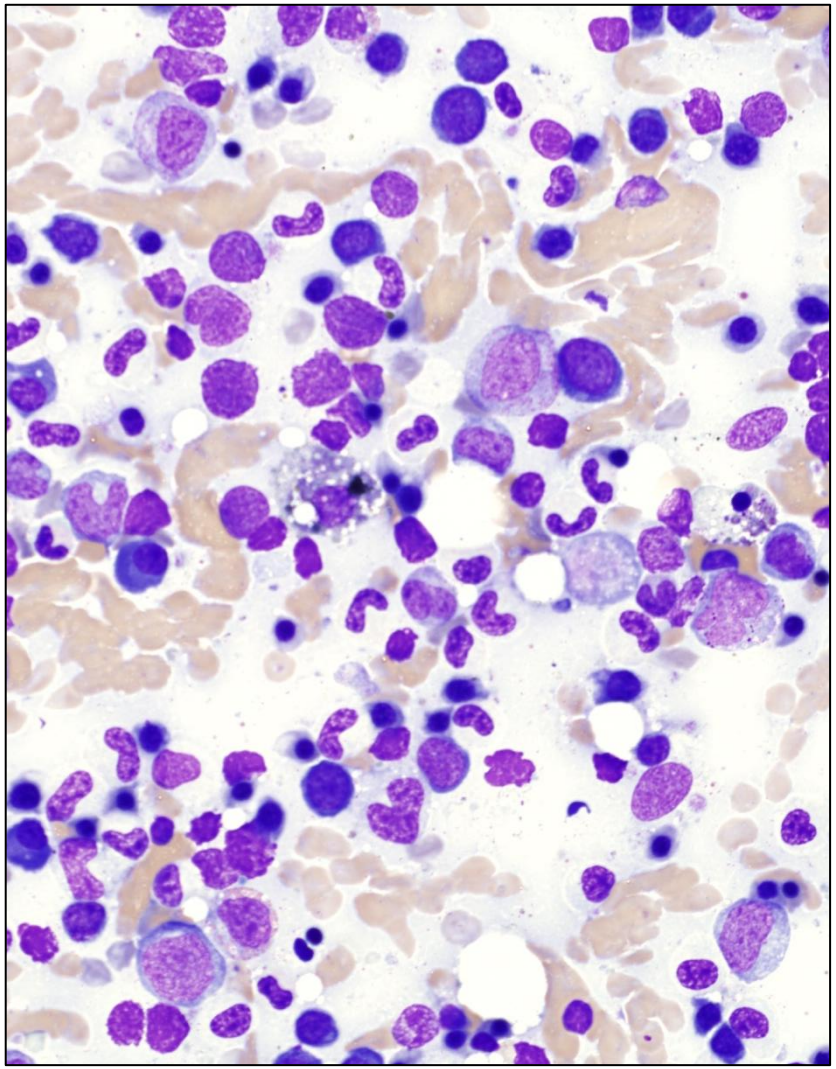
2011 Hematology Glass Slides Example # 3

- Myeloid series:
- Early to mid-stage maturation is synchronous
- Segmented forms absent
- Cells with mature cytoplasm have oval to band shaped nuclei



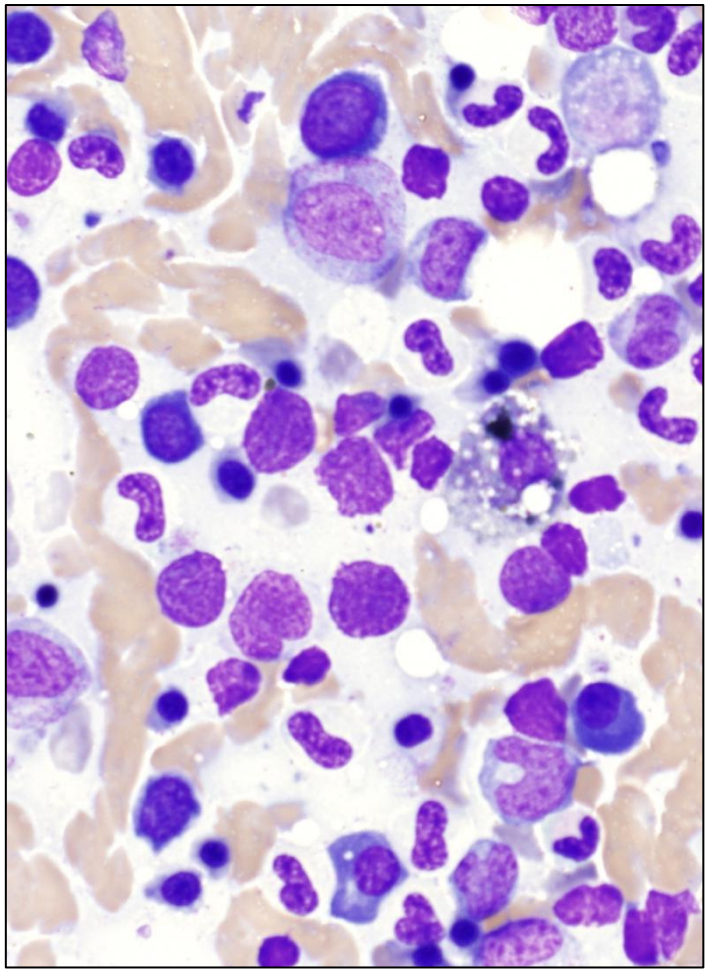
2011 Hematology Glass Slides Example # 3

- Erythroid series:
- Normal morphology
- Normal maturation
- Moderate #s of polychromatophils



2011 Hematology Glass Slides Example # 3

- Plasma cells – normal to mildly increased
- Lymphocytes – few present (normal)
- Macrophages - rare



2011 Hematology Glass Slides Example # 3

- Consistent with Pelger-Huet anomaly
- Erythroid hyperplasia
- Possible mild megakaryocytic and plasma cell hyperplasia
- Other considerations for hyposegmentation:
  - pseudo-PHA or immune destruction of segs
  - Incipient recovery from insult to granulocytic series
- Check granulocyte morphology on blood smear (or accept correlate with CBC findings)
- Pelger-Huet Anomaly clinically insignificant in dogs

2011 Hematology Glass Slides Example # 3

Description	Points
Highly cellular (0.5), many unit particles (1), many individual nucleated cells (0.5)	2.0
Background: lipid vacuoles & blood (or any reasonable description)	1.0
Unit particles: normocellular to hypercellular	1.0
Storage iron – small to moderate amount (within normal limits)	1.0
Megakaryocytes:	
Normal to mildly increased #s	0.5
Morphology within normal limits	0.5
Some immature forms	0.5
M:E ratio: mildly decreased (0.5) and rough estimate (1.5) of ~1:2	2.0
Granulocytic series:	
Early to mid-stage maturation is synchronous	1.0
Segmented forms are absent	1.5
Cells with mature cytoplasm have oval to band-shaped nuclei	1.0
Erythroid series:	
Normal morphology	1.0
Synchronous maturation	1.0
Moderate #s of polychromatophils	0.5
Plasma cells – low #s (normal) to mildly increased	1.0
Lymphocytes – low #s (normal)	0.5
Macrophages – rare	0.5

2011 Hematology Glass Slides Example # 3

Interpretation	Points
Consistent with Pelger-Huet anomaly	1.0
Erythroid hyperplasia	1.0
Possible mild megakaryocytic hyperplasia (equivocal - not all will note)	-
Possible mild plasma cell hyperplasia (equivocal - not all will note)	-

Comments / Additional tests	Points
Ddx for hyposegmentation:	
Pseudo-PHA or immune destruction of segs (either for mark)	0.5
Incipient recovery from insult to granulocytic series	0.5
Check granulocytic morphology on blood smear (or accept correlate with CBC findings)	0.5
Pelger-Huet anomaly clinically insignificant in dogs	0.5
Breed association – Australian shepherds may be noted	-

Total Points	20

Hematology Projected Images

- Hematology images in 2011:
  - 29 digital images in one hour
  - 1.5 – 2 minutes per image
  - Images are projected only once
  - Images are large – generally fill whole screen
  - 1 - 2 points per image
  - 20% of total hematology section score
    - Multiple choice 40 %
    - Glass slides 40 %

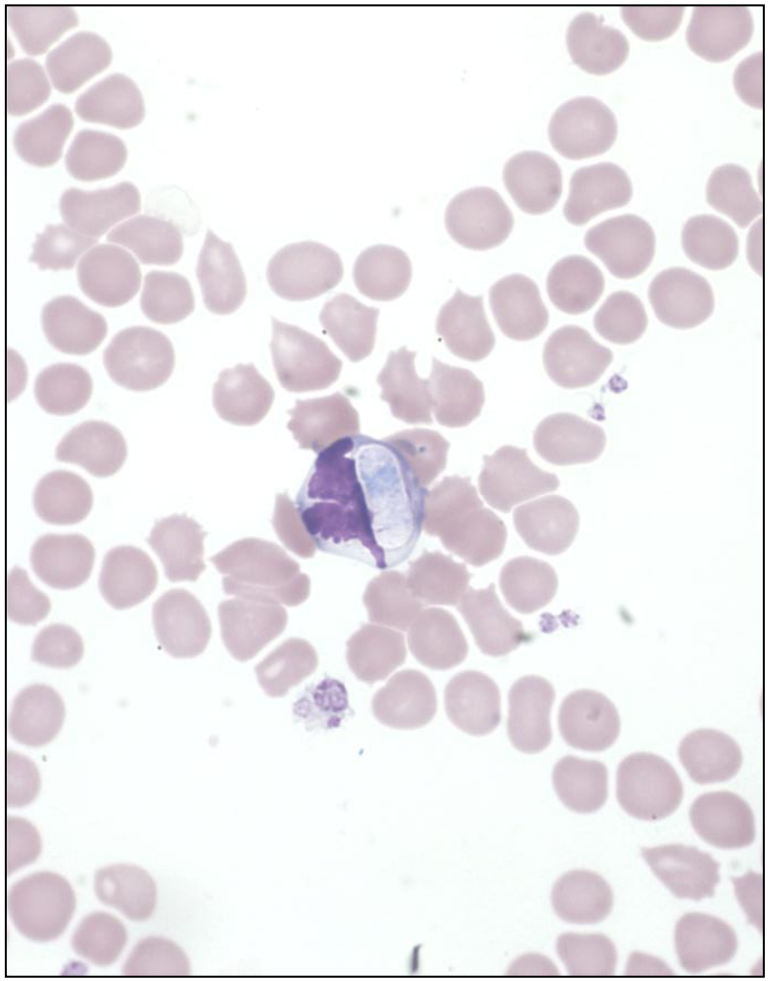
Hematology 2011 Projected Images

- May ask these types of questions:
  - Identification of cell or structure
  - Provide a diagnosis or interpretation
  - Possible causes
  - Associated laboratory findings
  - Further tests such as stains to aid diagnosis

- May include images of:
  - Blood smears (Wright-Giemsa, special stains)
  - Bone marrow aspirates or H&E sections
  - Electron micrographs
  - Histograms
  - Immunohistochemical stains
  - Laboratory based visual results such as crossmatching

2011 Hematology Projected Images Example # 1

- Canine blood smear
- 1 point
- Diagnosis:
- *Hepatozoon* spp infection (or hepatozoonosis)
- Either term was acceptable for full mark



2011 Hematology Projected Images Example # 2

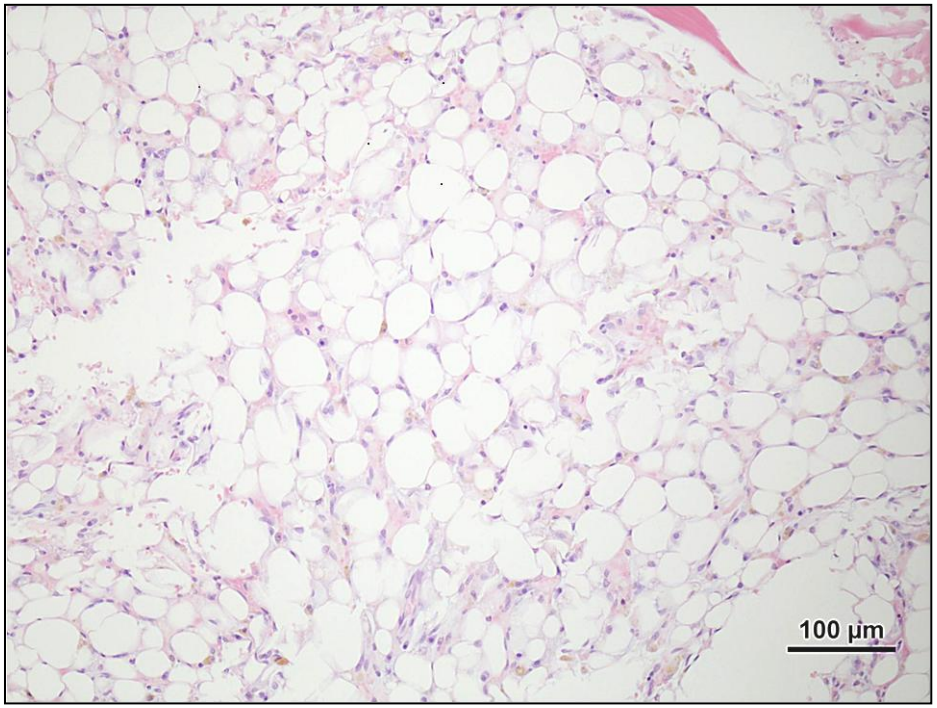
- Porcine blood
- Scanning electron micrograph, 1 point
- Diagnosis:
- *Mycoplasma haemosuis* infection
- Accept mycoplasmosis, hemoplasmosis
- ½ point was given for *Eperythrozoon suis* infection or eperythrozoonosis (in 2011 only ☺)

2011 Hematology Projected Images Example # 3

- Dog bone marrow H&E stain
- 1 point
- Diagnosis:

  Aplasia

  (accept severe or marked panhypoplasia)



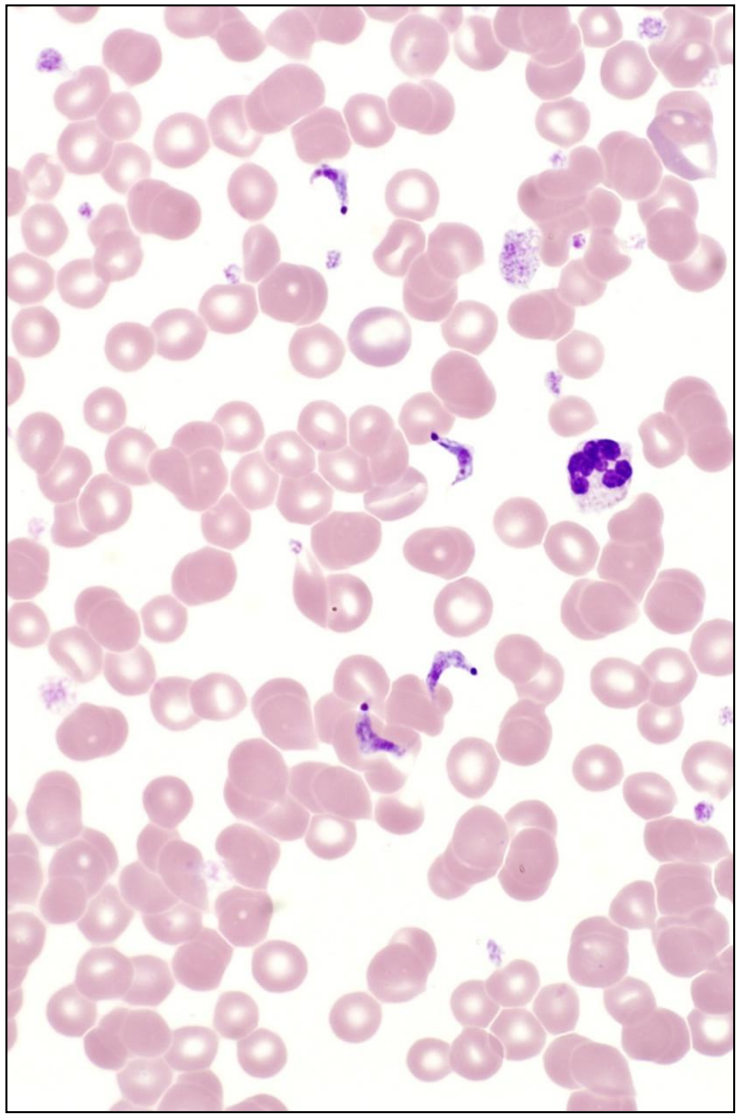
2011 Hematology Projected Images Example # 4

- Canine blood smear
- 1.5 points (0.5 each)
- Identify the finding

  Presence of trypanosomes
- Name the disease:

  Chagas disease
- Name tissue most commonly affected in this disease:

  Heart

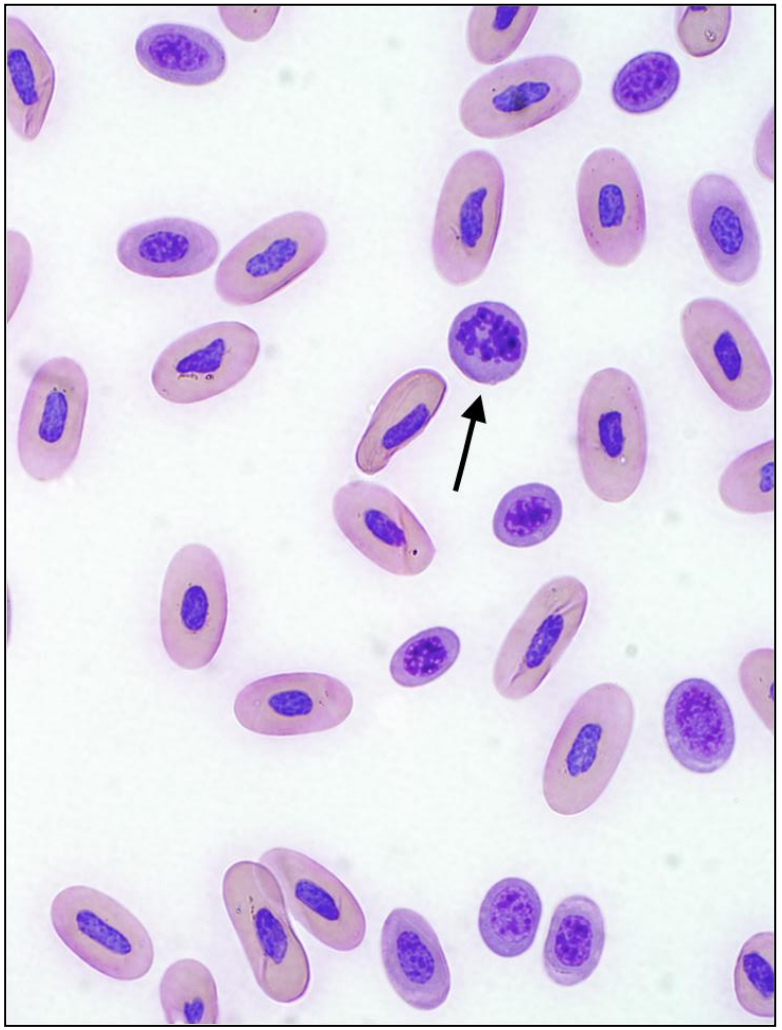


2011 Hematology Projected Images Example # 5

- Chameleon blood smear. Patient is anemic.
- Interpretation (1 point)
  Regenerative response to anemia
- Identify and give significance of object indicated by arrow

  (1 point)

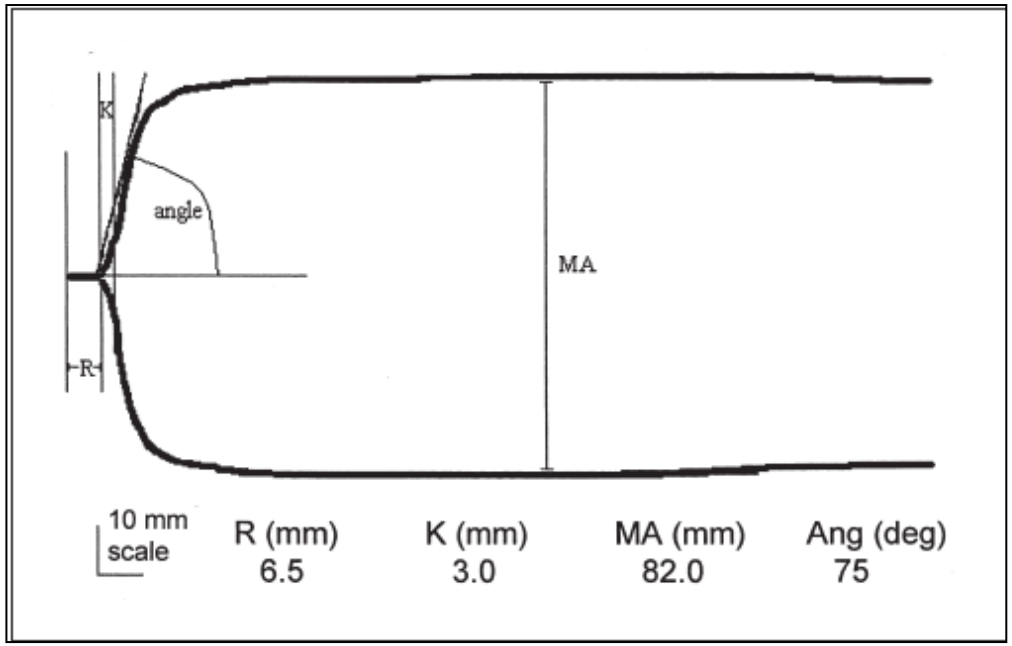
  Mitotic polychromatophil, not unusual to see in regenerative anemia



2011 Hematology Projected Images Example # 6

- Canine blood, thromboelastography tracing
- 1 point
- Interpretation:

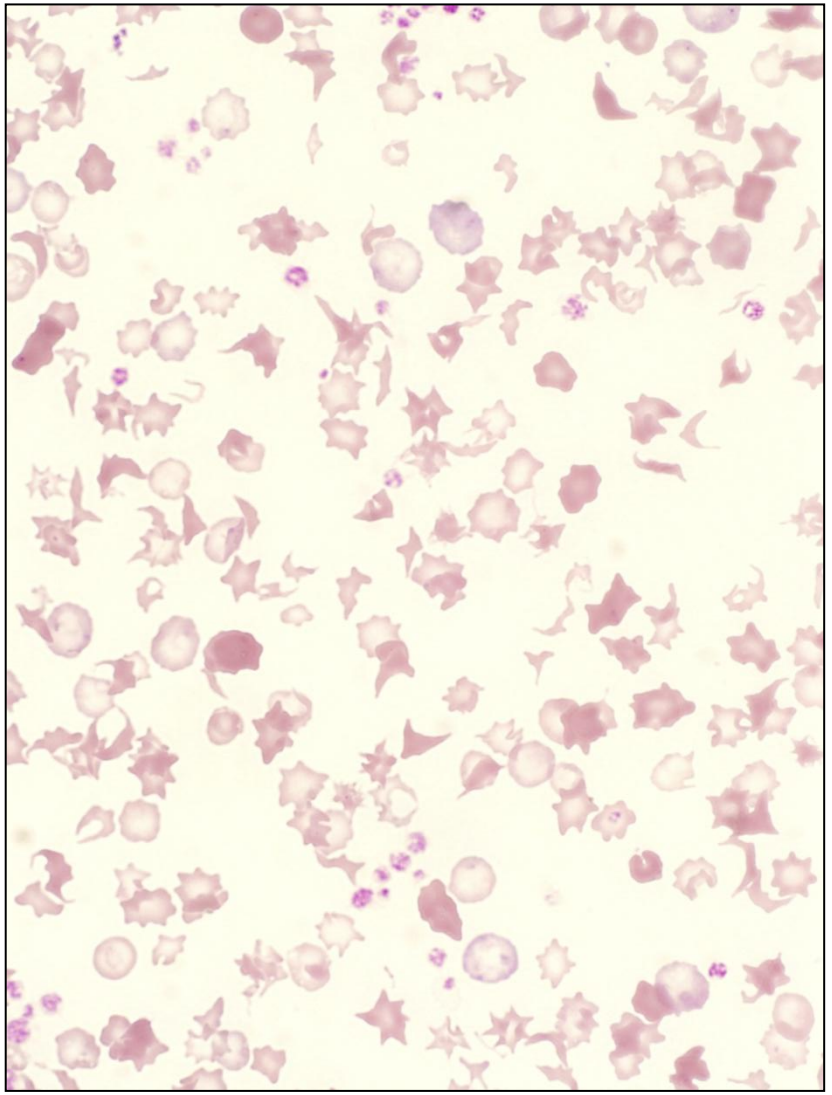
  Hypercoagulable state



2011 Hematology Projected Images Example # 7

- Porcine blood smear
- I point
- Interpretation:

  Iron deficiency anemia



Cytology and Surgical Pathology (CSP) Glass Slides

- 15 glass slides in 3 hours
  - ~12 minutes / slide
  - 2 candidates share a flat of slides
  - Given species and sample type:
  - Example: Dog, peritoneal fluid, direct smear
- Mainly cytology but also histopathology
- 50 % of CSP section:
  - 25 % projected images
  - 25 % multiple choice

Cytology and Surgical Pathology (CSP) Glass Slides

- Cytologic sample types can include:
  - Impression smears or aspirates from masses or organs
  - Direct smears or cytospun preparations of fluids including urine
  - Fecal smears
  - Washes or lavages

Cytology and Surgical Pathology Glass Slides

- Sample type in 2011:
  - 13 cytology
  - 2 histopathology
- Species in 2011:
  - 10 canine
  - 1 feline
  - 1 camelid (alpaca)
  - 2 equine
  - 1 avian (parrot)
- Each case usually worth 20 points
  - ~12-16 points for description & organization
  - ~4 - 8 points for interpretation & additional tests

Cytology and Surgical Pathology Glass Slides

- Sample Sources in 2011:
  - Skin= 1
  - Lung=1
  - Pericardial fluid = 1
  - Pleural fluid=1
  - Peritoneal fluid = 2
  - Spleen=2
  - Lymph node =3
  - Abdominal mass = 2
  - Celomic mass = 1
  - Liver= 1

CSP Glass Slides

- Provide a morphologic description:
  - "This must provide the reader with a clear, concise description of pertinent qualitative and quantitative findings."
- Provide an interpretation:
  - "As specifically as possible, provide any of the following that appear applicable to each case:
    - Diagnosis of disease or process
    - Characterization of effusions
    - Differential diagnosis
    - Potential etiologies
    - Additional tests you would recommend"

CSP Glass Slides – General Examples (not specifically from 2011)

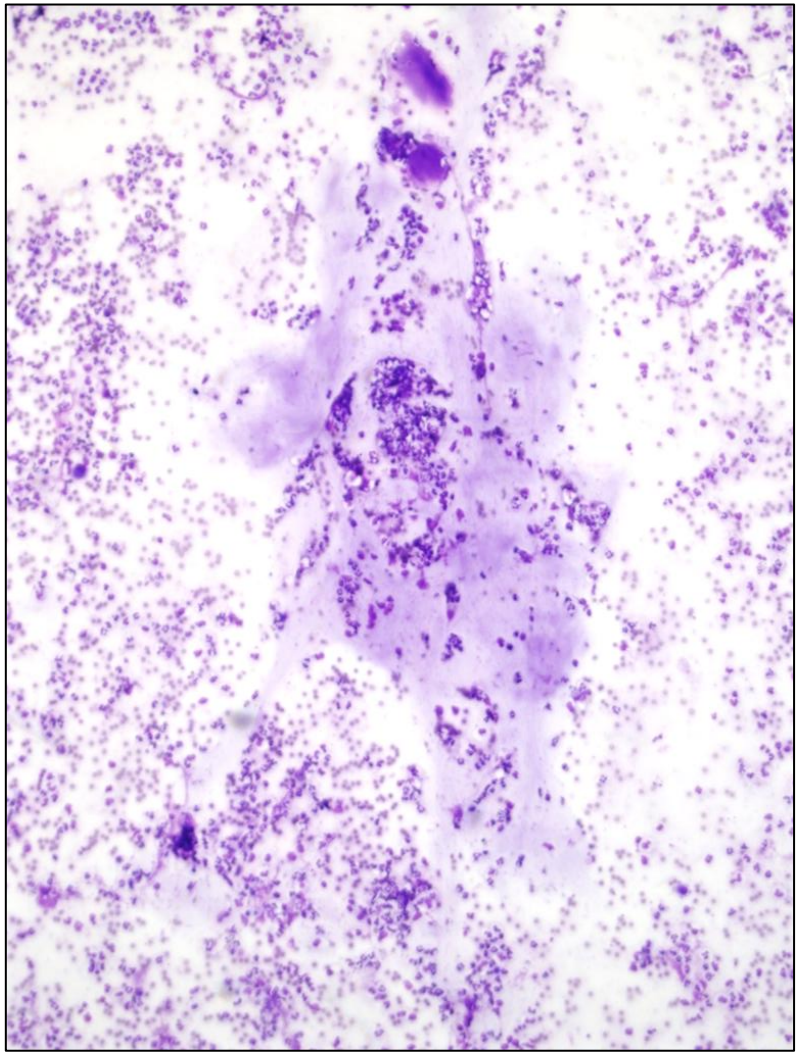
- Diagnosis of disease or process
  - Septic neutrophilic inflammation
- Characterization of effusions
  - Exudate
- Differential diagnosis
  - Osteosarcoma or chondrosarcoma
- Potential etiologies
  - *Actinomyces* or *Nocardia* spp
- Additional tests you would recommend
  - Immunohistochemistry: suggest markers

CSP Glass Slides

- Point form is acceptable
- Include information on nucleated cellularity, erythrocytes and background
- Negative findings may be important:
  - “Neutrophils are non-degenerate”
  - “No infectious agents are seen”
  - “The organisms are non-staining”

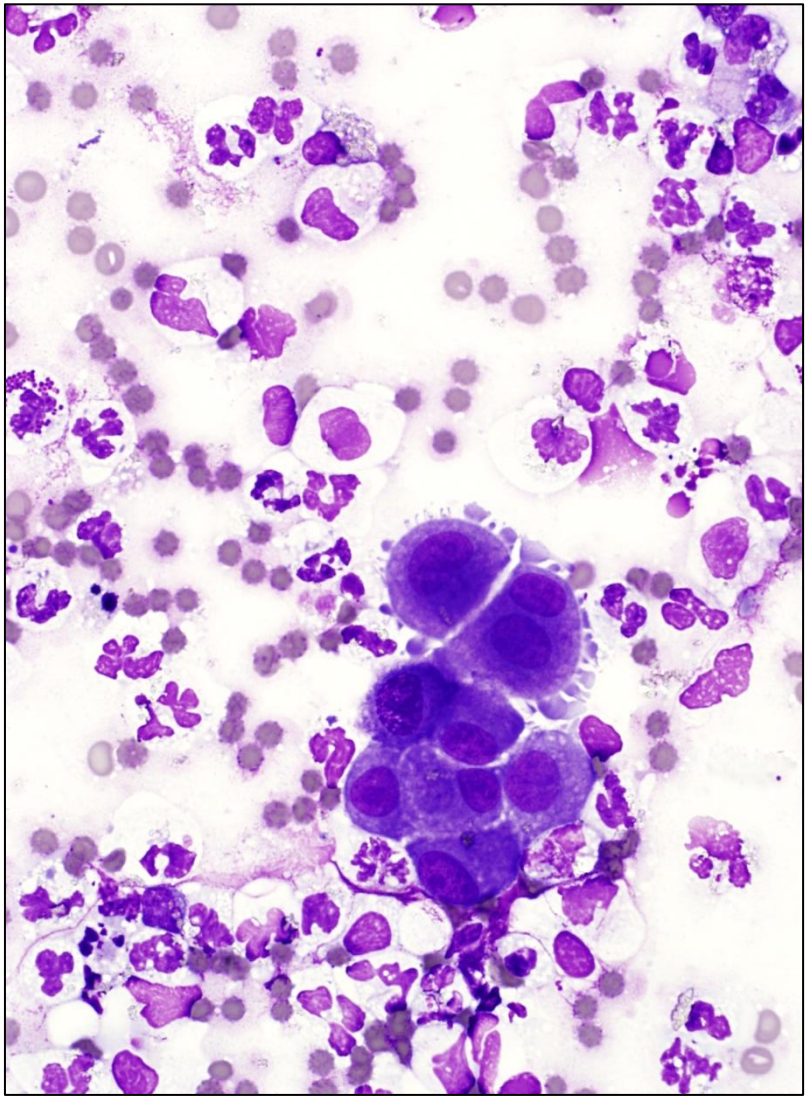
2011 CSP Glass Slides Example # 1

- Dog, peritoneal fluid, direct smear
- Cellularity is high
- Moderate amount of cellular debris & erythrocytes
- Scattered foci of amorphous pale lavender material



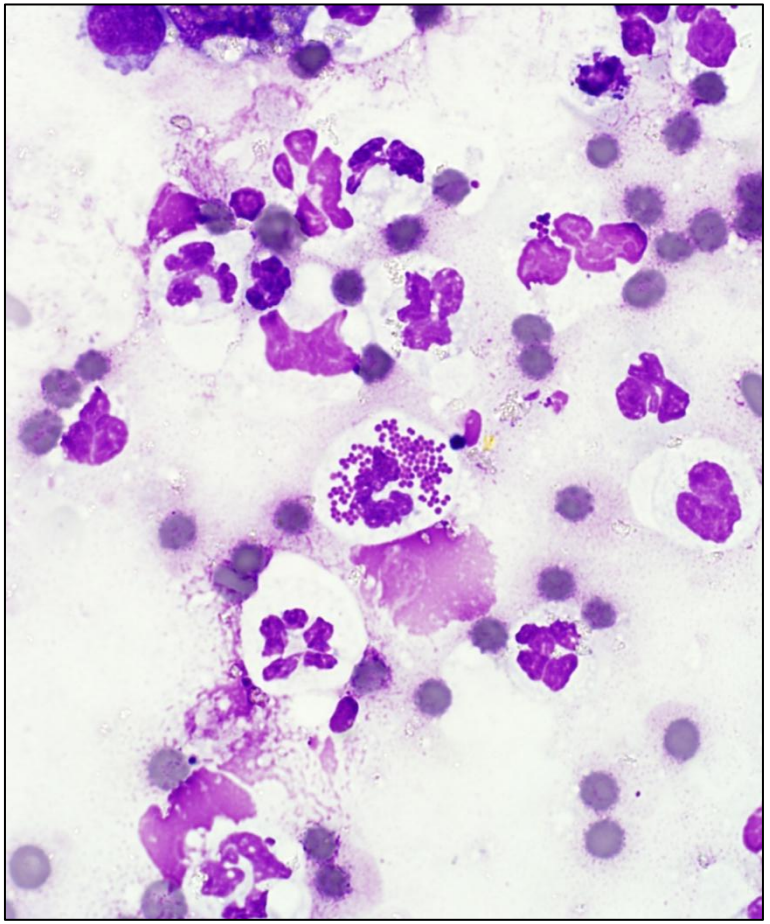
2011 CSP Glass Slides Example # 1

- Neutrophils predominate
- Degenerative change
- Often contain small irregular poorly staining crystalline material
- Few mesothelial cells



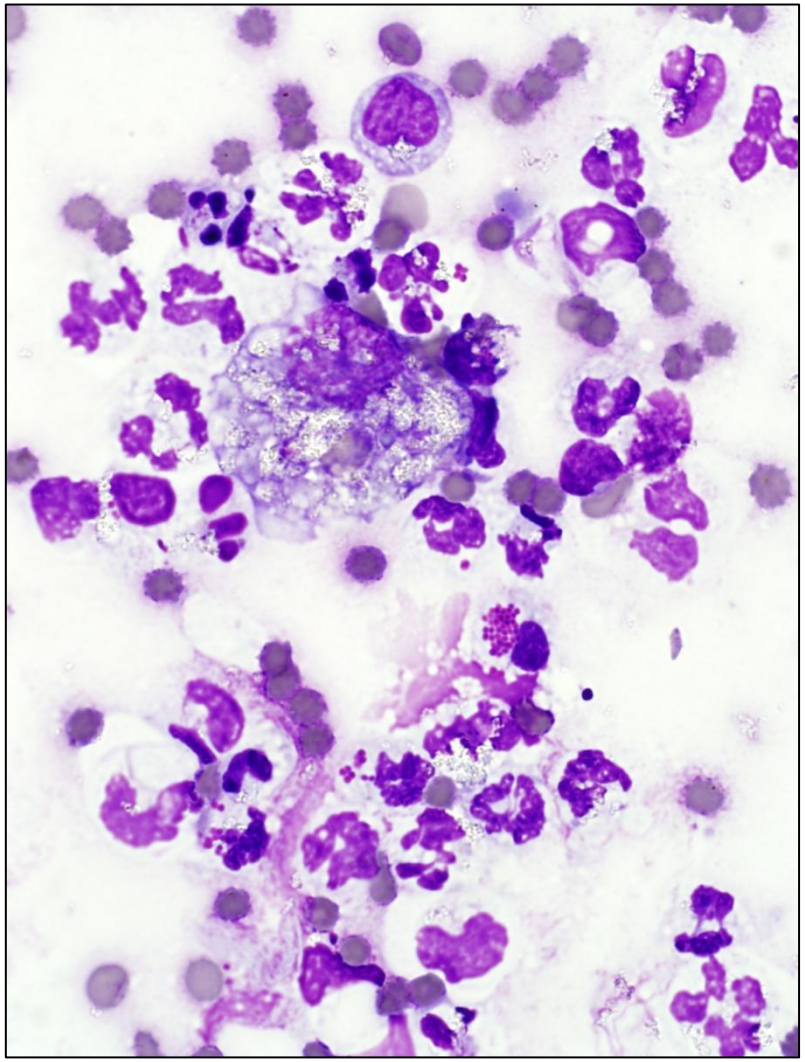
2011 CSP Glass Slides Example # 1

- Neutrophils contain bacteria
- Mainly cocci



2011 CSP Glass Slides Example # 1

- Lower #s of macrophages
- Also contain crystalline material
- Many cells have nuclear pyknosis or karyorrhexis



2011 CSP Glass Slides Example # 1

- Septic neutrophilic / purulent / suppurative to pyogranulomatous inflammation
- Various terms acceptable but need to note mainly neutrophils with fewer macrophages
- Crystalline material consistent with barium
- Mucoid material consistent with white bile (or accept clear biliary fluid)
- Additional tests could include:
  - Measure bilirubin in paired peritoneal fluid and serum samples
  - Culture and sensitivity

2011 CSP Glass Slides Example # 1

Description	Points
Cellularity is high	1.0
Scattered foci of amorphous pale lavender material (mucus)	1.0
Moderate amount of cellular debris and erythrocytes	1.0
Rare small irregular bright yellow forms consistent with bilirubin crystals	1.0
Neutrophils predominate	1.0
Moderate to marked degenerative change	1.0
Neutrophils often contain small irregular poorly staining crystalline material	1.0
Intracellular bacteria	1.0
Primarily cocci	1.0
Lower #s of macrophages	1.0
Often contain the crystalline material seen in the neutrophils	1.0
Neutrophils & macrophages occasionally contain fragments of cellular debris	1.0
Few mesothelial cells	1.0
Many cells with nuclear pyknosis or karyorrhexis	1.0

2011 CSP Glass Slides Example # 1

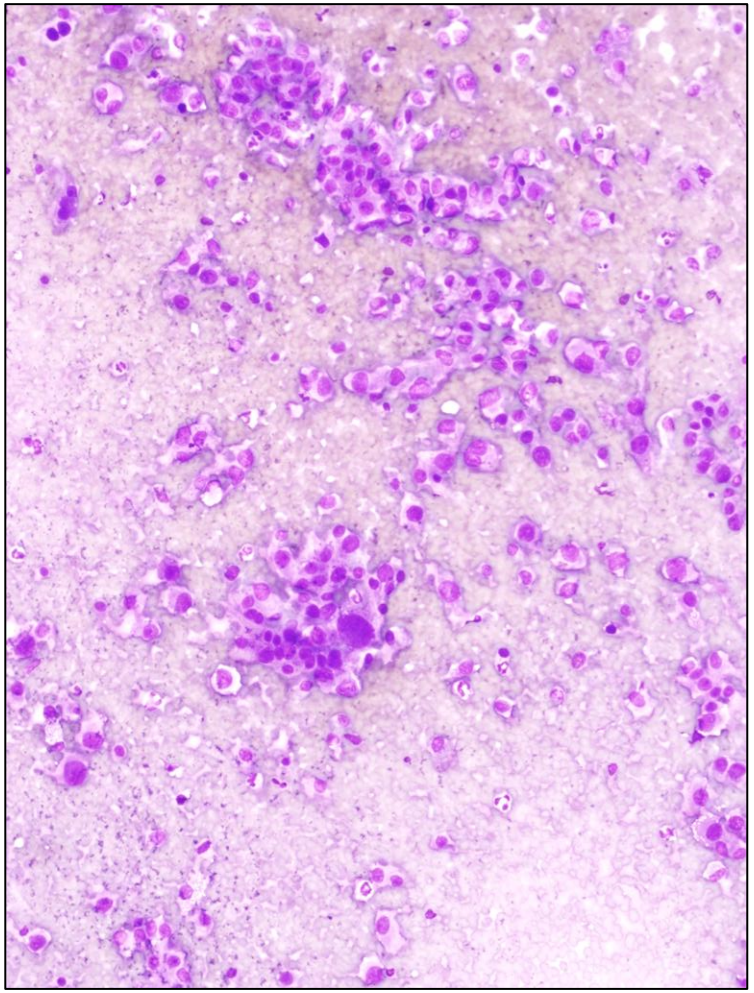
Interpretation	Points
Neutrophilic / purulent / suppurative to pyogranulomatous inflammation (various terms acceptable to denotes neutrophils and fewer macrophages)	1.0
Sepsis	1.0
Crystalline material consistent with barium	1.0
Mucoid material consistent with white bile (or accept clear biliary fluid)	1.0

Comments / Additional tests	Points
Measure bilirubin in paired peritoneal fluid and serum samples (0.5 for either)	1.0
Culture and sensitivity	1.0

Total Points	20

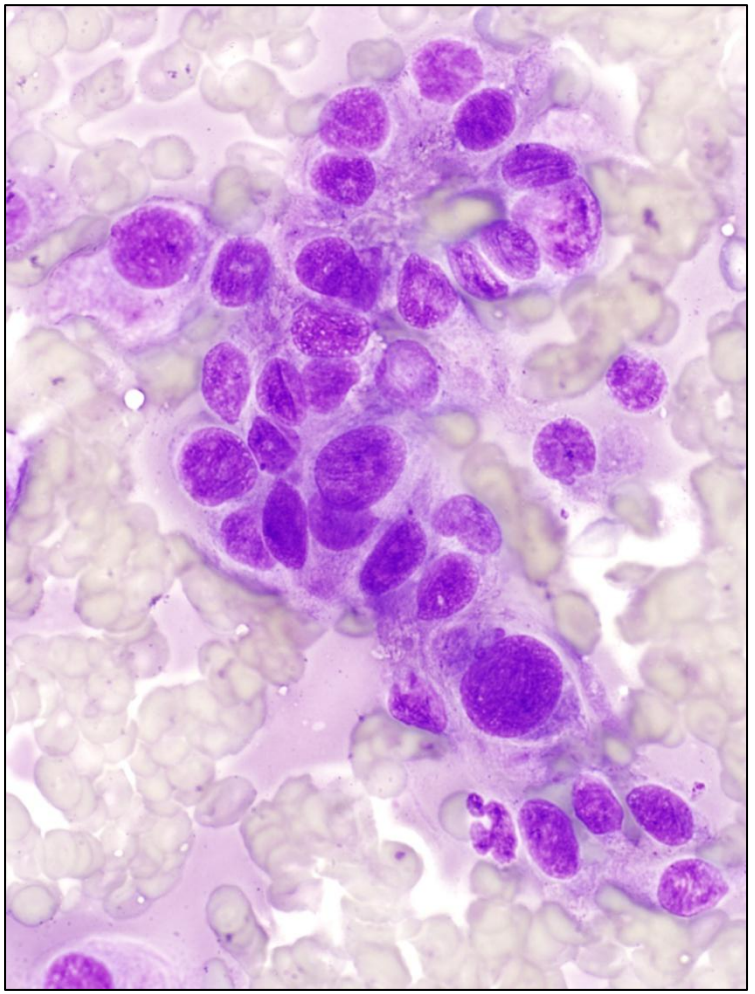
2011 CSP Glass Slides Example # 2

- Dog, subcutaneous mass, impression smear
- Highly cellular
- Abundant erythrocytes
- Predominant population of atypical cells



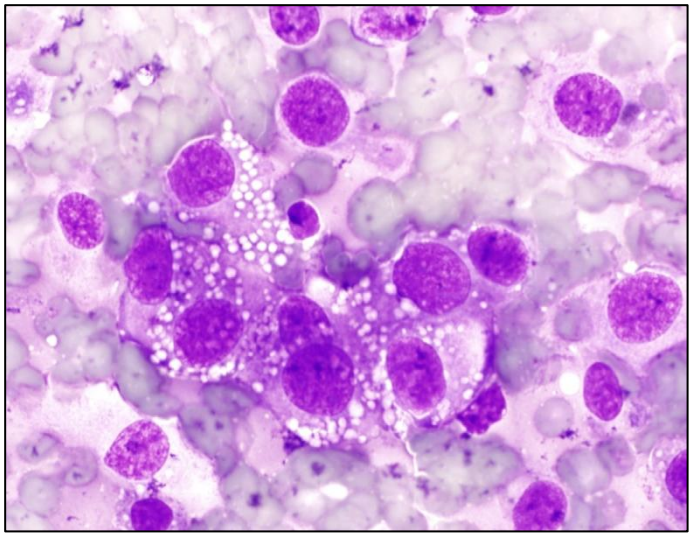
2011 CSP Glass Slides Example # 2

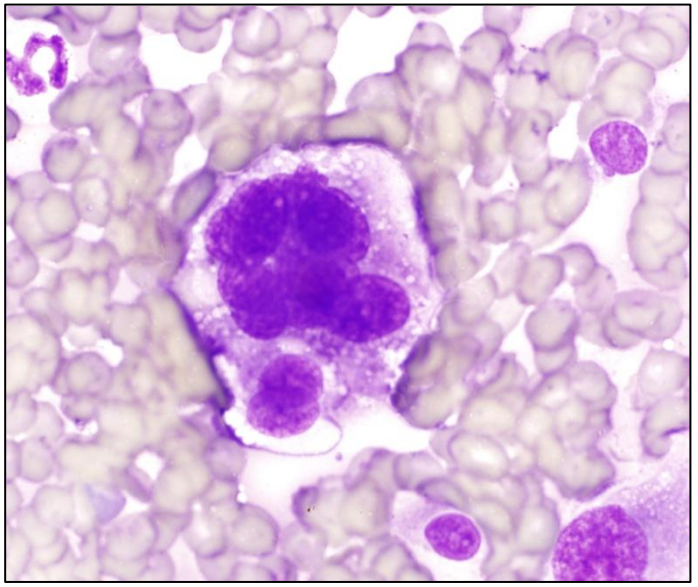
- Singly or occasionally in small aggregates
- Spindloid to ovoid
- Moderate to marked anisocytosis and anisokaryosis
- Variable N/C ratio



2011 CSP Glass Slides Example # 2

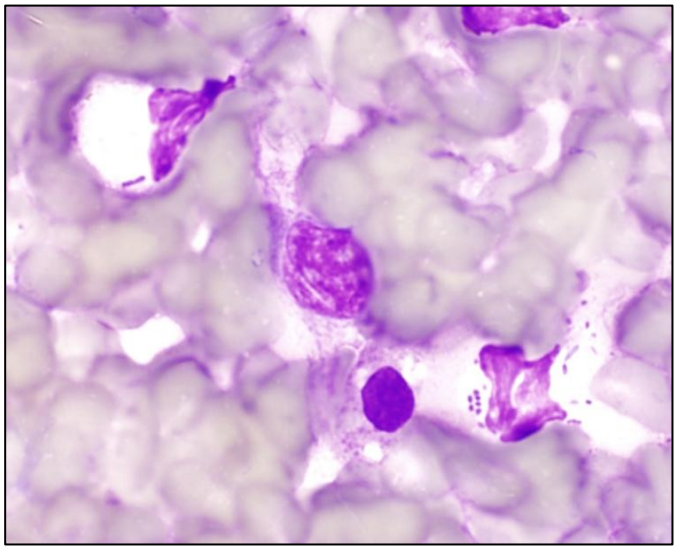
- Basophilic cytoplasm with small vacuoles
- Nucleus round to oval
- Finaly stippled to granular chromatin
- Frequent multinucleation
- Atypical nucleoli

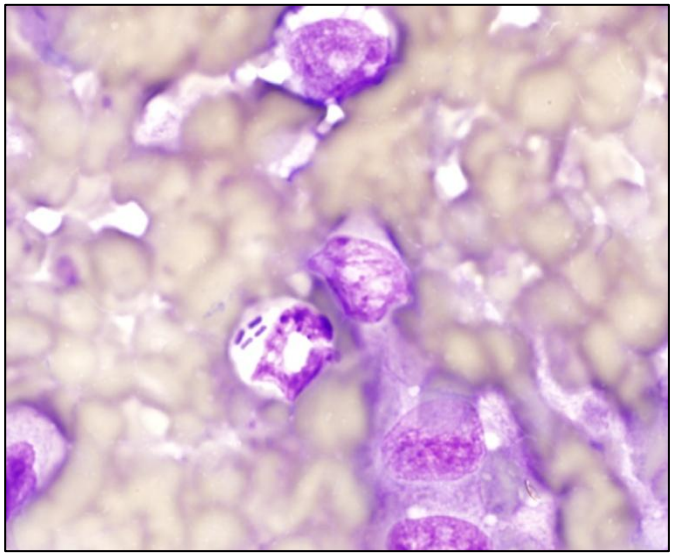




2011 CSP Glass Slides Example # 2

- Low #s of neutrophils
- Degenerate
- Intracellular bacteria
- Rods or cocci





2011 CSP Glass Slides Example # 2

- Sarcoma
- Neutrophilic inflammation
- Sepsis
- Additional tests could include:
  - Biopsy /histopathology
  - Immunohistochemistry
  - Culture & sensitivity

2011 CSP Glass Slides Example # 2

Description	Points
Highly cellular sample	0.5
Abundant erythrocytes	1.0
Predominant population of atypical cells	1.0
Found singly	0.5
Occasionally in small aggregates	0.5
Spindloid to ovoid to flag-shaped	1.0
Moderate to marked anisocytosis	1.0
Moderate to marked anisokaryosis	1.0
Variable N/C ratio	0.5
Cytoplasm	
Basophilic cytoplasm	0.5
Small discrete vacuoles	1.0
Nucleus	
Round to oval	0.5
Chromatin finely stippled to granular	1.0
Frequent multinucleation	1.0
Atypical nucleoli	1.0
Low numbers of neutrophils	1.0
Degenerate	1.0
Intracellular bacterial (rods or cocci)	1.0
Occasional macrophages with hemosiderin / hematoidin (not all will see)	-

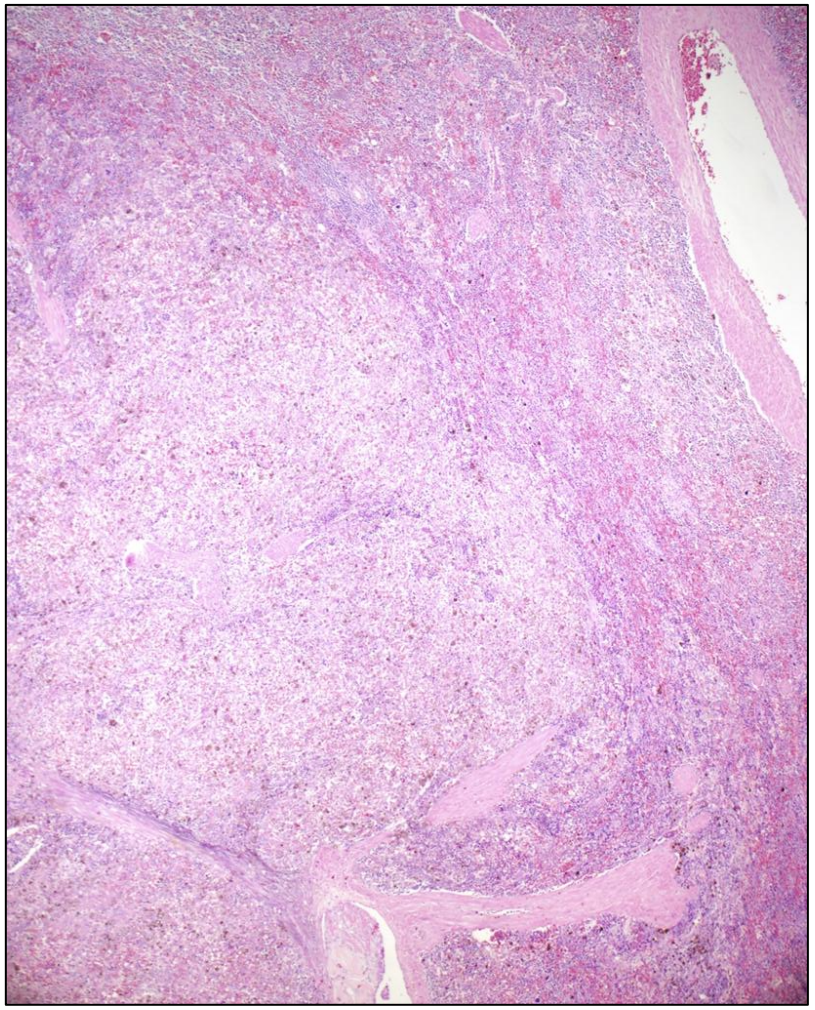
2011 CSP Glass Slides Example # 2

Interpretation	Points
Sarcoma (list 2 possible differentials) Neutrophilic inflammation Sepsis	2.0 1.0 1.0

Additional tests	Points
Biopsy /histopathology Immunohistochemistry (suggest markers) or culture & sensitivity also acceptable additional tests	1.0
Total Points	**20**

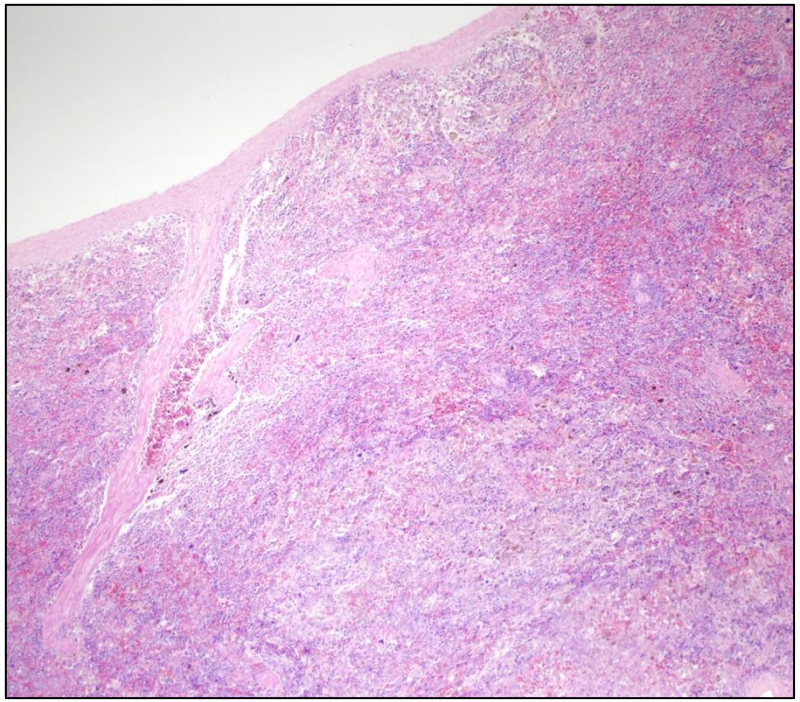
2011 CSP Glass Slides Example # 3

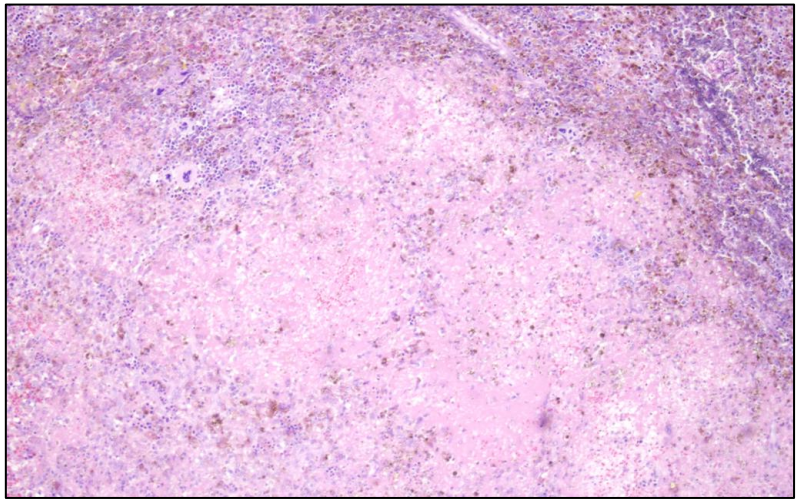
- Dog splenic biopsy
- H&E stain
- Multifocal nodules
- Poorly demarcated
- Sheets of neoplastic cells
- Non-encapsulated
- Fine vascular stroma



2011 CSP Glass Slides Example # 3

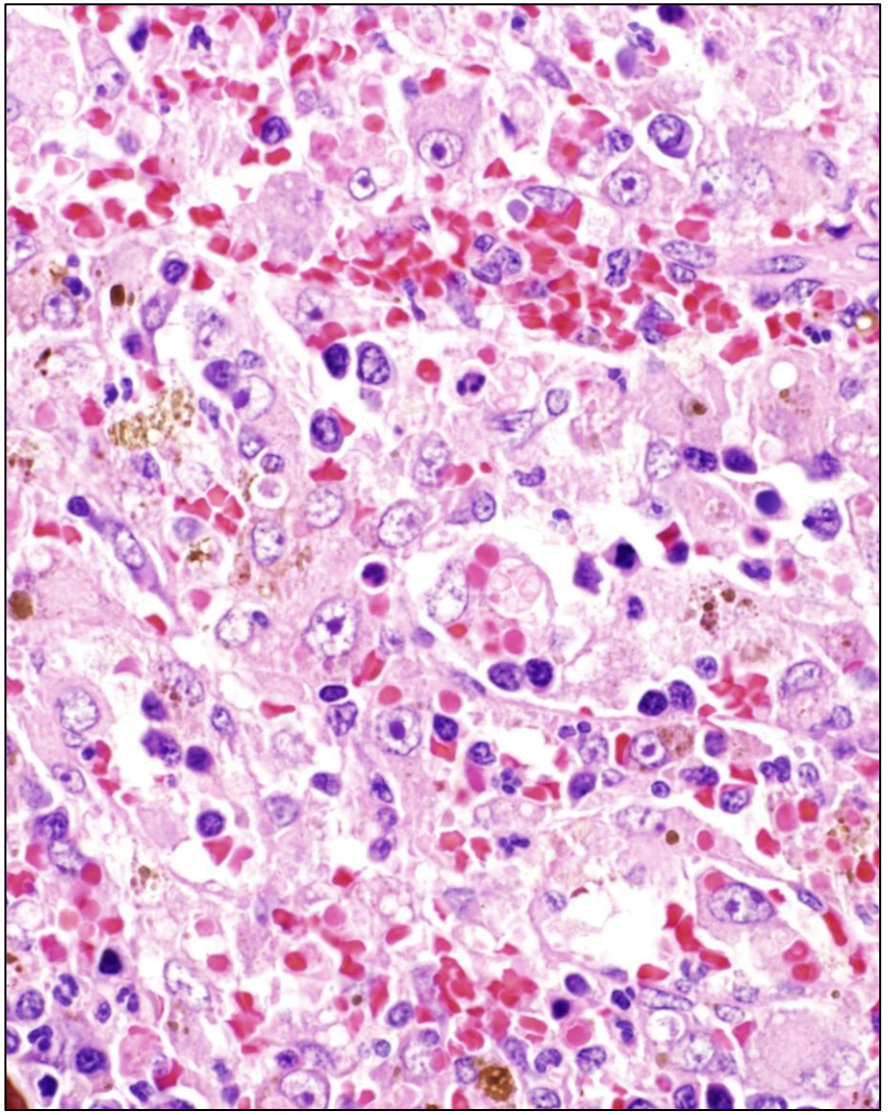
- Tumor cells causing compression of parenchyma / normal architecture
- Also accept effacement or disruption
- Multifocal areas of necrosis





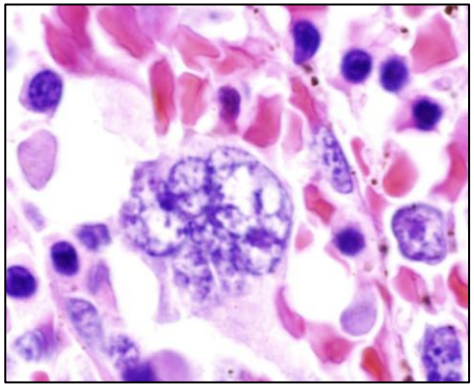
2011 CSP Glass Slides Example # 3

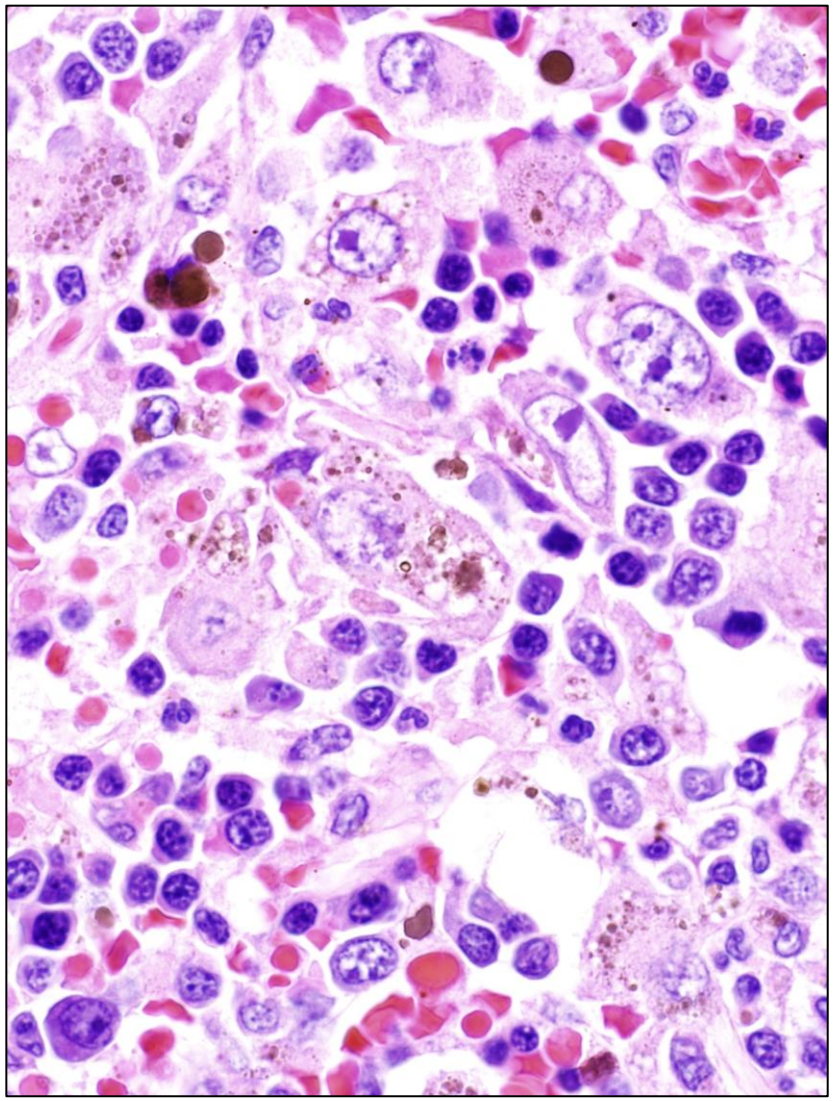
- Large, round to polygonal neoplastic cells
- Cytoplasm eosinophilic and occasionally vacuolated



2011 CSP Glass Slides Example # 3

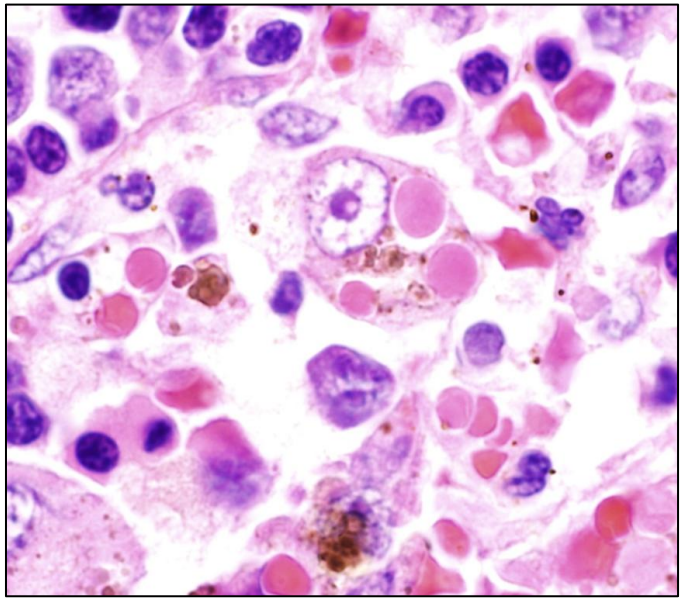
- Open chromatin
- Prominent nucleoli
- Multinucleation
- Low mitotic activity
- Moderate anisocytosis & anisokaryosis
- Variable N:C ratio

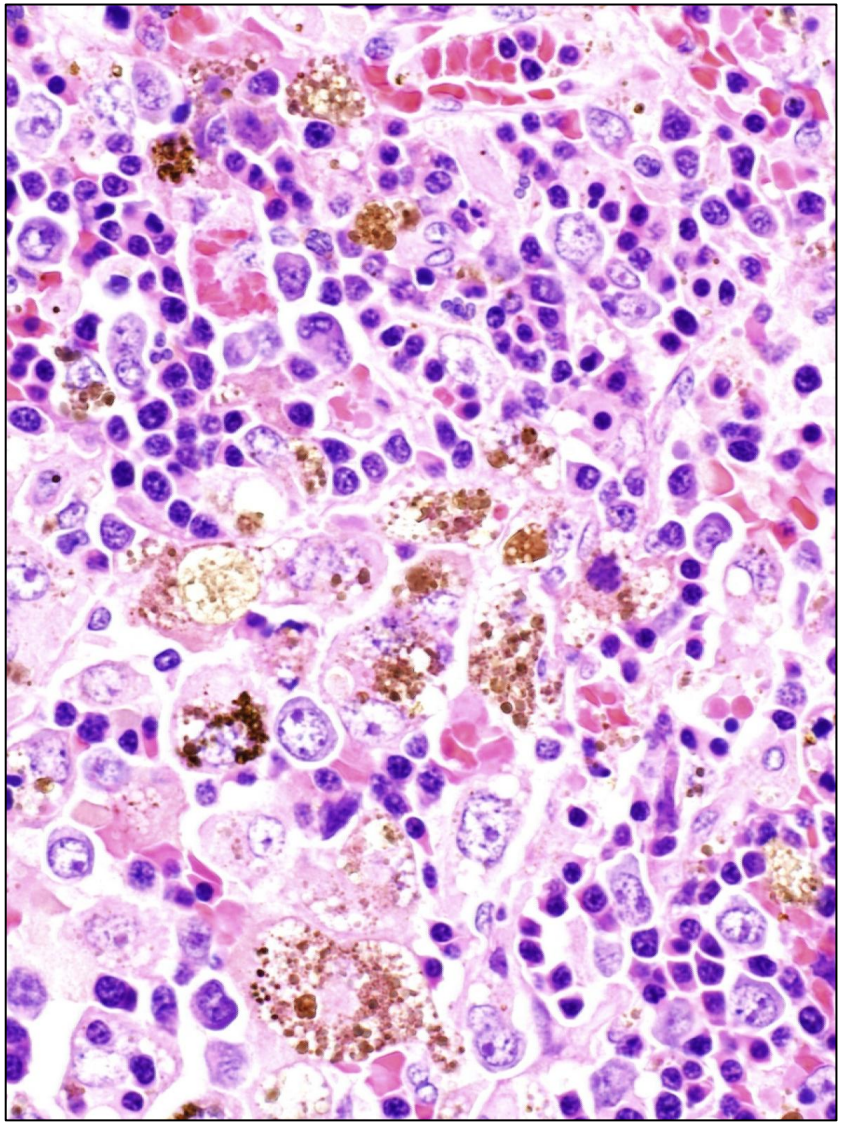




2011 CSP Glass Slides Example # 3

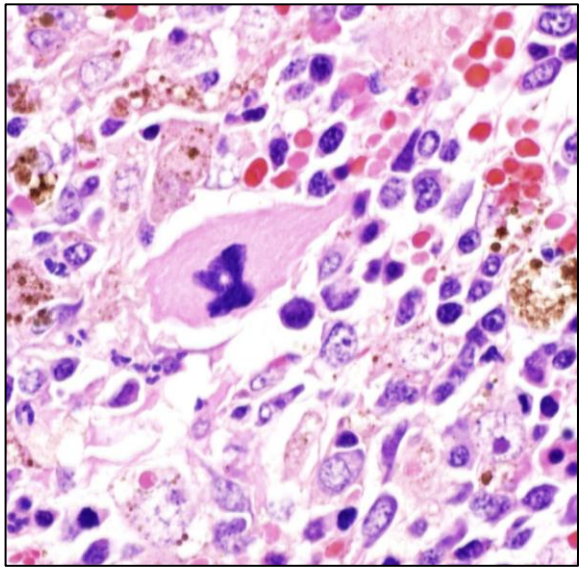
- Erythrophagocytosis
- Gold to black pigment consistent with hemosiderin

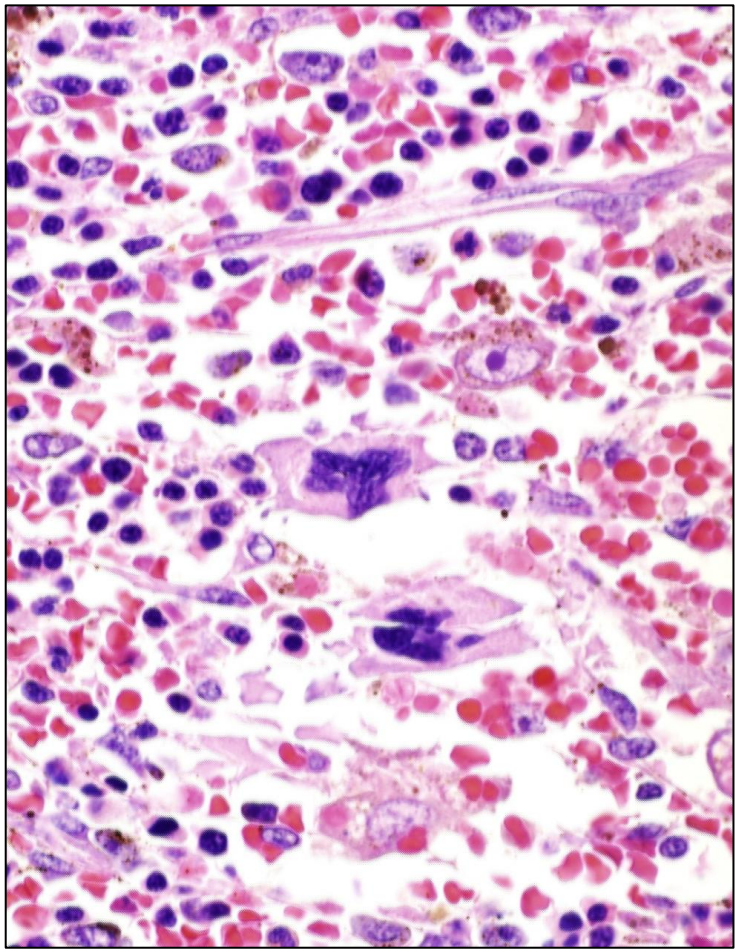




2011 CSP Glass Slides Example # 3

- Multifocal aggregates of hematopoietic precursors





2011 CSP Glass Slides Example # 3

- Consistent with histiocytic sarcoma
- ½ marks for mesenchymal tumor, sarcoma or malignant neoplasia
- Hemophagocytic variant
- Presence of extramedullary hematopoiesis
- Further tests – immunohistochemistry

2011 CSP Glass Slides Example # 3

Description	Points
Multifocal nodules	0.5
Poorly demarcated / diffuse	0.5
Non-encapsulated	0.5
Composed of sheets of neoplastic cells	1.0
Fine fibrovascular stroma	0.5
Causing mild compression of surrounding parenchyma (also accept disruption or effacement of normal parenchyma / architecture)	0.5
Neoplastic cells are large, round to polygonal (some indication of size/shape)	1.0
Cytoplasm of neoplastic cells:	
Eosinophilic	0.5
Occasionally vacuolated	0.5
Nuclei of neoplastic cells	
Open chromatin	1.0
Prominent / distinct / dark nucleoli	0.5
Frequent multinucleation	1.0
Low mitotic activity (~1 per 10 HPF)	0.5
Moderate anisocytosis	0.5
Moderate anisokaryosis	0.5
Variable N:C ratio	0.5
Frequent erythrophagocytosis	1.0
Gold to black pigment consistent with hemosiderin	1.0

2011 CSP Glass Slides Example # 3

Description, continued	Points
Multifocal aggregates of hematopoietic precursors	1.0
Decreased lymphocytes	1.0
Multifocal areas of necrosis	1.0

Interpretation	Points
Consistent with histiocytic sarcoma (1/2 marks for only saying mesenchymal tumor, malignant neoplasia)	2.0
Hemophagocytic	1.0
Evidence of extramedullary hematopoiesis	1.0

Comments / Additional tests	
Immunohistochemical confirmation – expression consistent with macrophages, not dendritic cells (CD11d+, not CD11c) MHC II+, possible poor/patchy CD1+	1.0

Total Points	20

Cytology & Surgical Pathology 2011 Projected Images

- The 2011 examination consisted of:
  - 35 images in one hour
  - 1.5 - 2 minutes / image
  - Images projected only once
  - Images are large – generally fill whole screen
  - 1 - 2 points per image
  - 25% of total CSP score
    - 50 % Glass slides
    - 25 % Multiple choice

Cytology & Surgical Pathology 2011 Projected Images

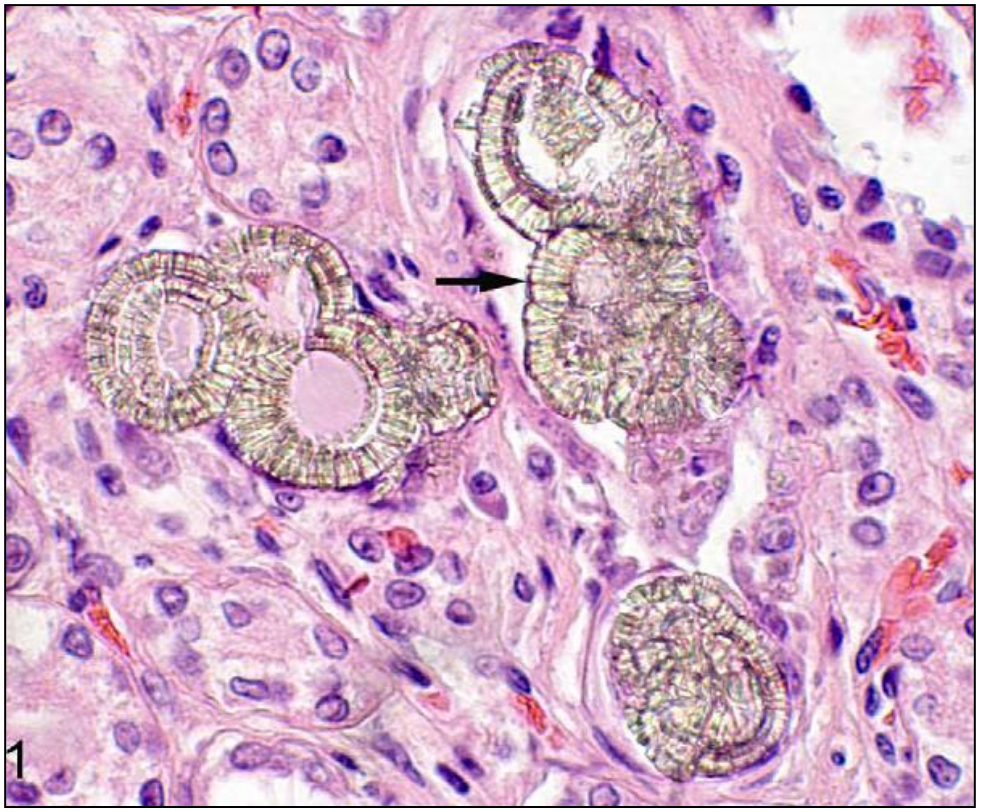
- Questions may ask for:
  - Description
  - Diagnosis
  - Identify indicated structure
  - Interpretation
  - Confirmatory tests or stains

Cytology & Surgical Pathology 2011 Projected Images

- May include images of:
  - Fine needle aspirates
  - Fluids (effusions, washes, lavages)
  - Scrapings or impression smears
  - Electron micrographs
  - Immunohistochemical staining
  - Biopsy sections – histopathology
  - Urine sediments
  - Flow cytometry histograms

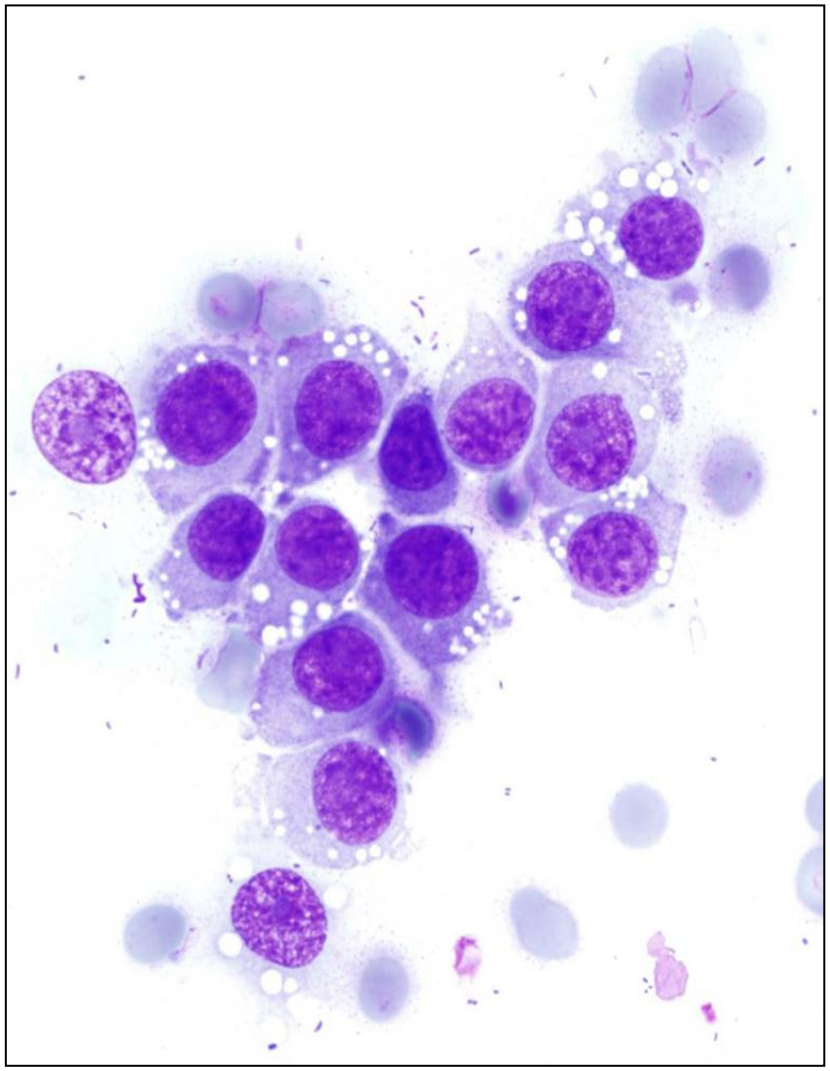
2011 CSP Projected Images Example # 1

- Biopsy of a kidney from a dog
- 1 point
- Identify:
- Melamine /cyanuric acid crystals



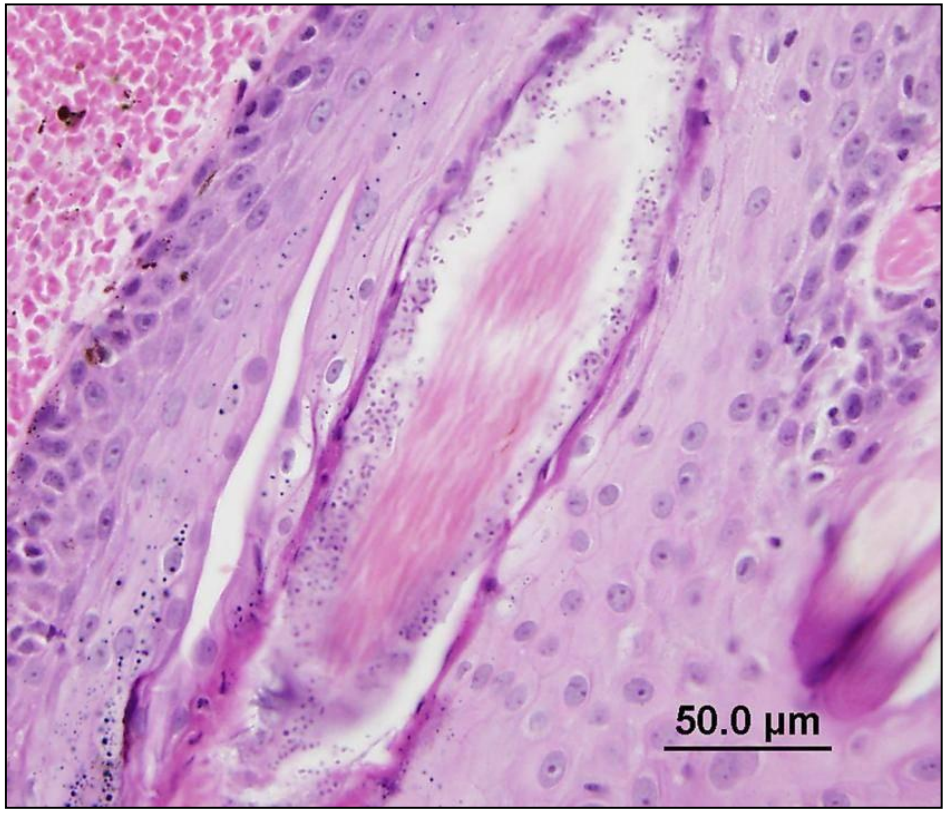
2011 CSP Projected Images Example # 2

- Aspirate from a nasal mass in a dog
- 1 point
- Diagnosis:
- Transmissible venereal tumor



2011 CSP Projected Images Example # 3

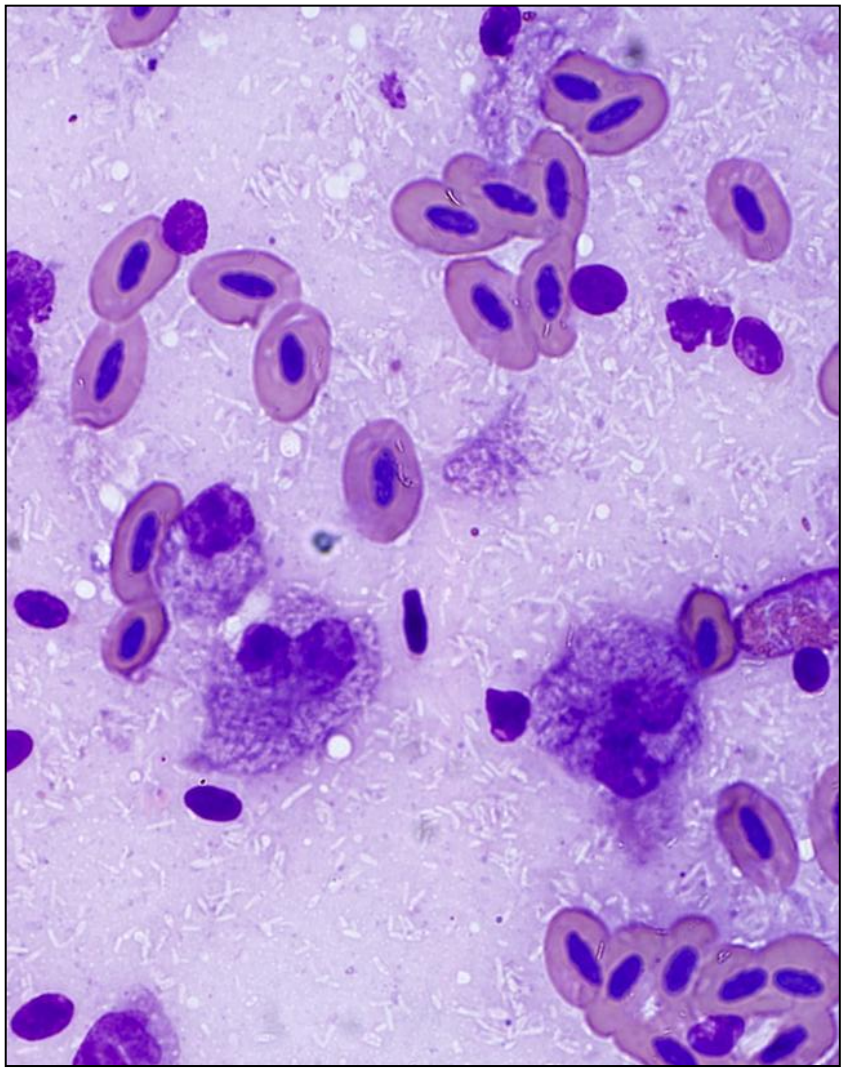
- Skin biopsy from a dog
- 1 point
- Diagnosis:
- Dermatophyte infection (or Dermatophytosis)
- Either term was acceptable for full point



2011 CSP Projected Images Example # 4

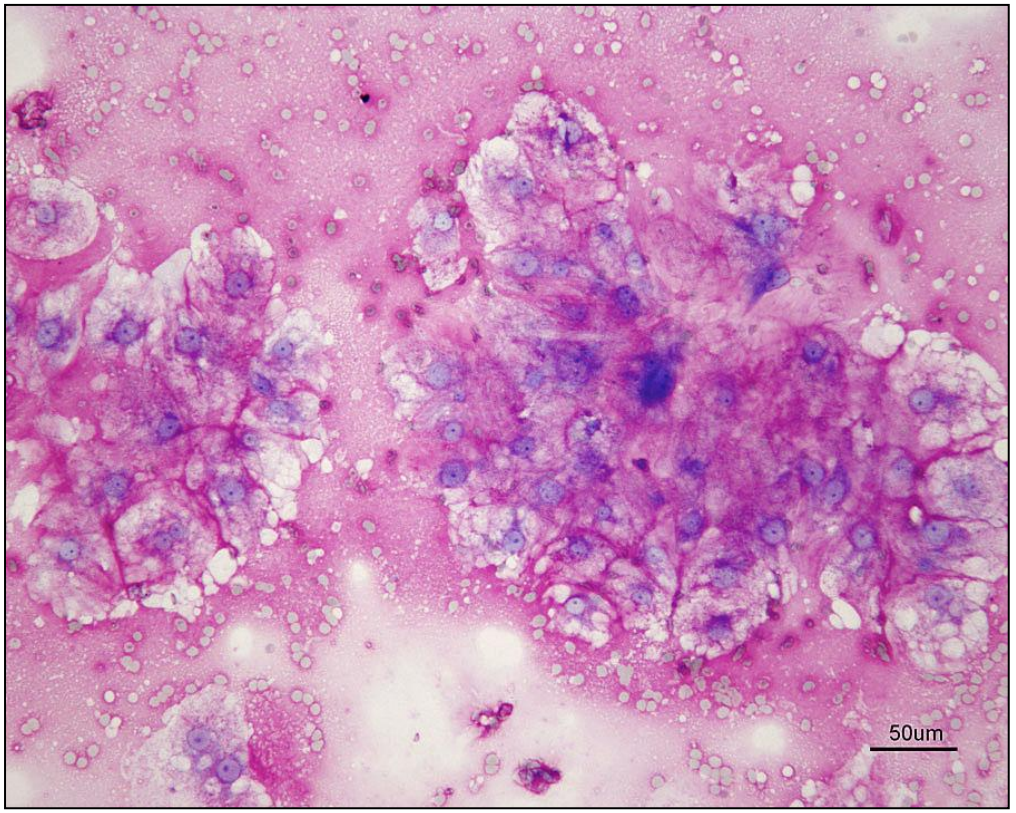
- Lung impression smear from a parrot
- 1 point
- Diagnosis:
- *Mycobacterium avium* or *spp*.

  (or Mycobacteriosis)
- Either term was acceptable for full point



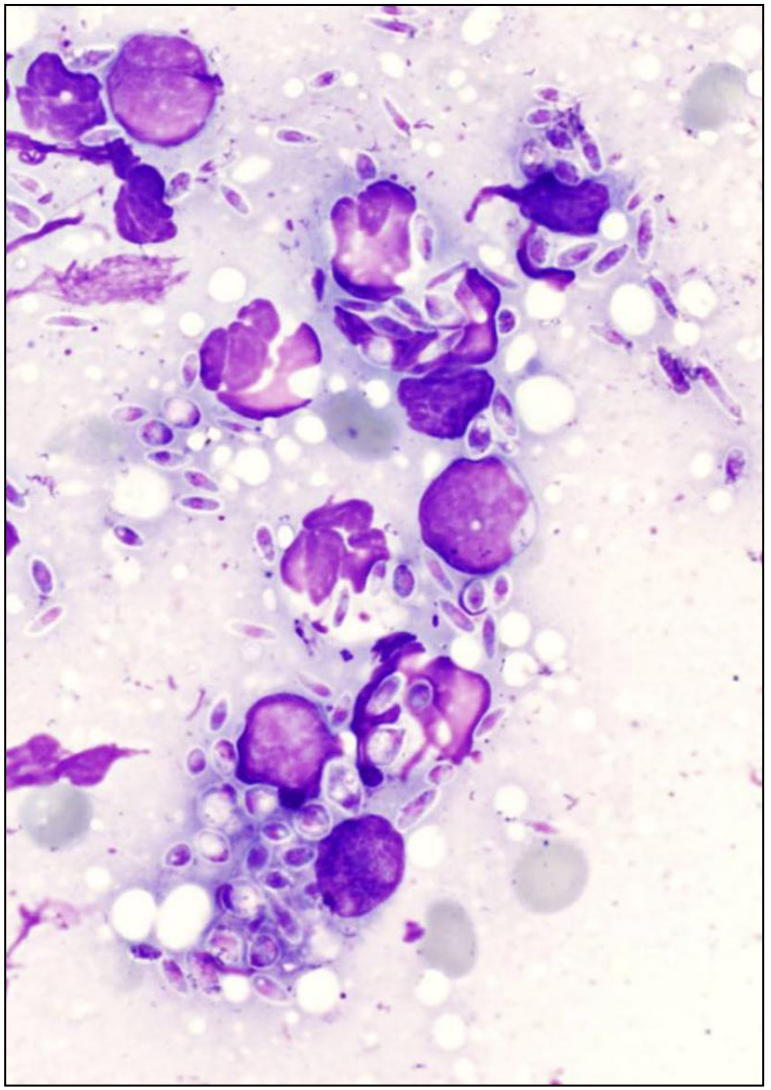
2011 CSP Projected Images Example # 5

- Aspirate of cervical mass from a ferret
- 1 point
- Name the tissue of origin:
- Notochord



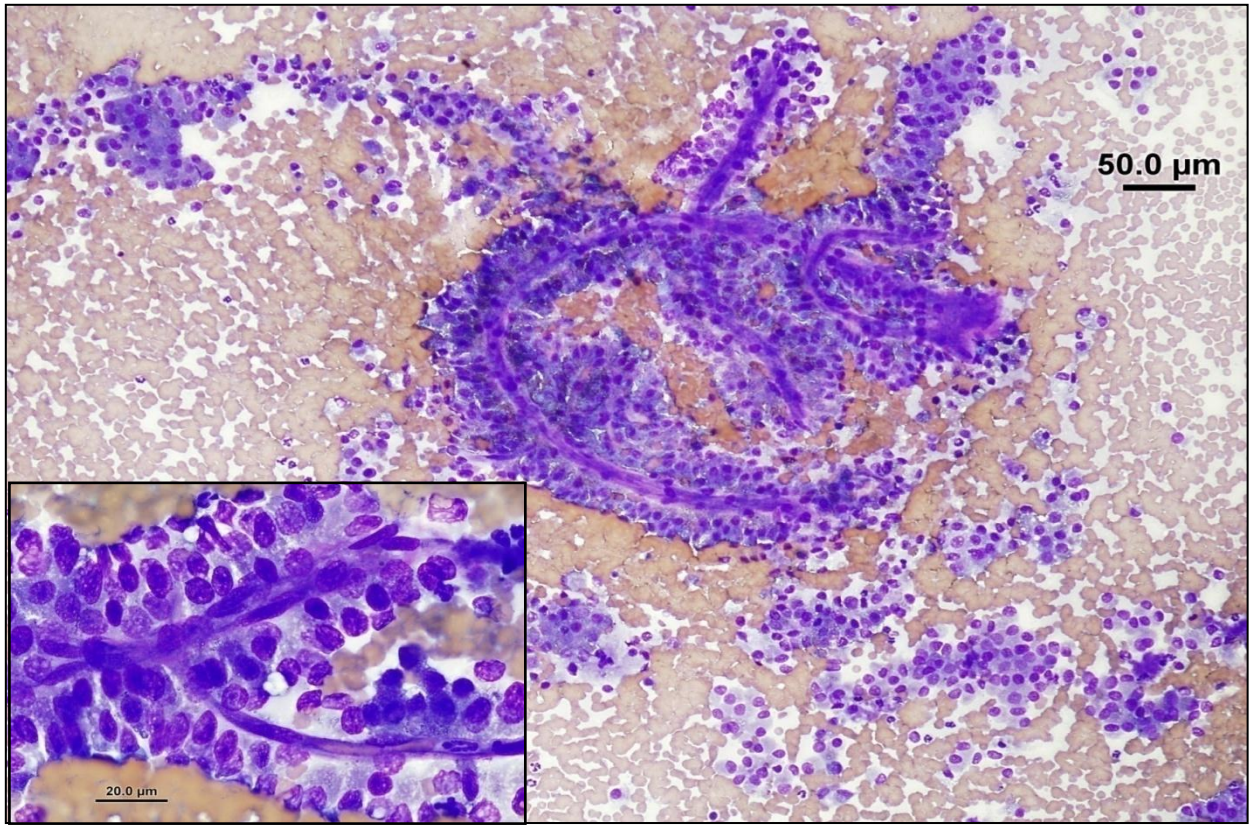
2011 CSP Projected Images Example # 6

- Skin impression smear from a dog
- 1 point
- Diagnosis:
- *Sporothrix schenckii* (Sporotrichosis)
- Either term was acceptable for full point



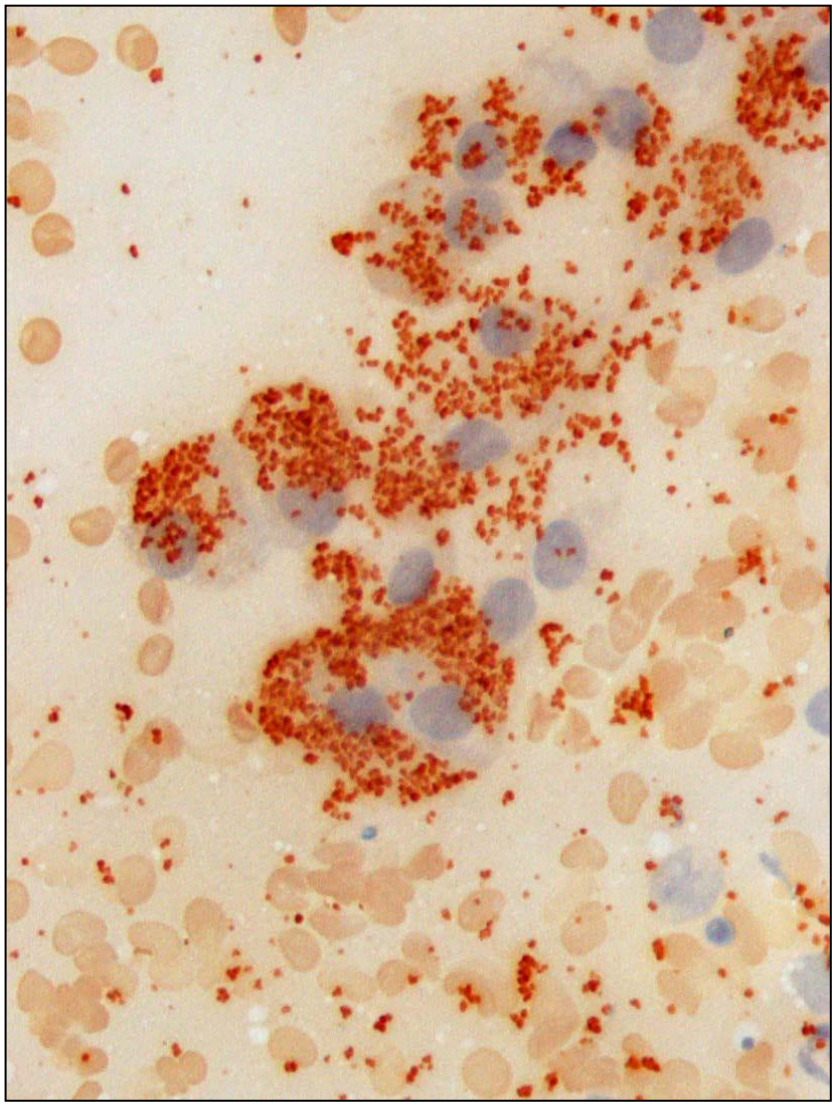
2011 CSP Projected Images Example # 7

- Aspirate of a testicular mass from a dog
- 1 point. Diagnosis: Interstitial cell tumor



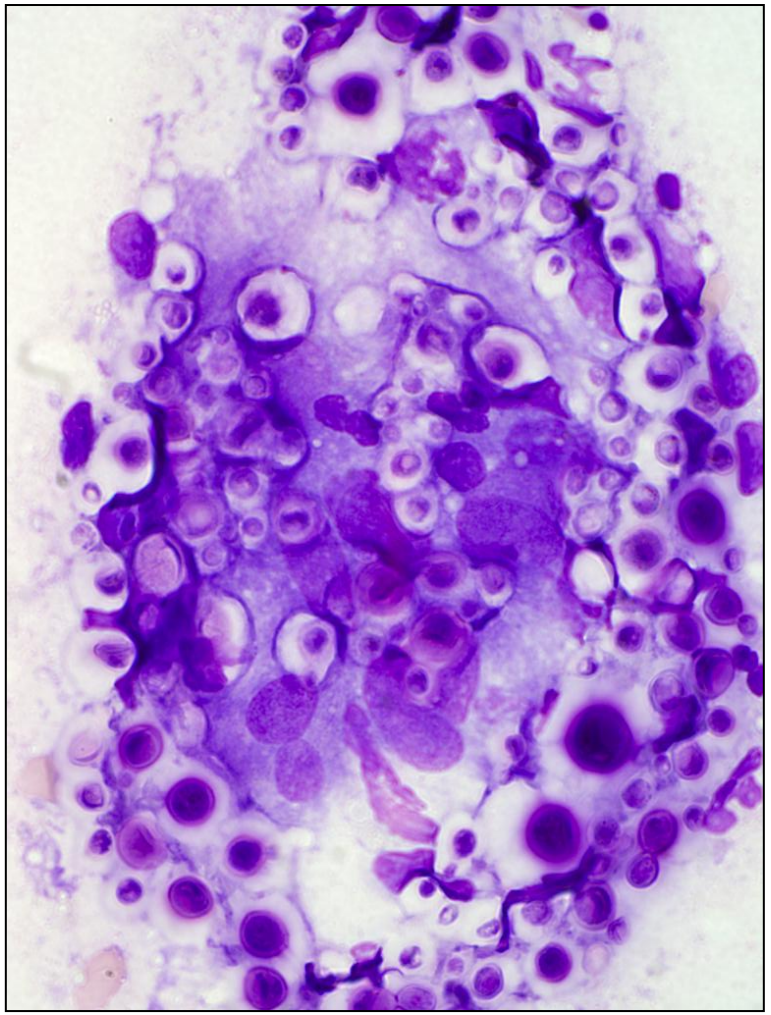
2011 CSP Projected Images Example # 8

- Liver aspirate from a dog
- Rhodanine stain
- 1 point
- Diagnosis:
- Copper toxicosis



2011 CSP Projected Images Example # 9

- Cerebrospinal fluid from a horse
- 1 point
- Diagnosis:
- *Cryptococcus neoformans* (Cryptococcosis)
- Either term was acceptable for full point
- Note: *C. gattii* would also be correct



2013 ACVP Certifying Examination:
September 17,18,19th in Ames, Iowa

Questions?