2026
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WORLD CLASSIC
CELEBRATING THE CHAMPIONS OF CARE
VMX
VETERINARY MEETING & EXPO

Conflict of Interest Disclosure:

We have financial interest, arrangement or affiliation with:

Speaker	Name of Organization	Relationship
Fred Metzger	IDEXX	Speaker
Dennis B. DeNicola	IDEXX	Speaker

Diagnostic triathlon: Practical application of CBC, Biochemistry and urine, going for gold!

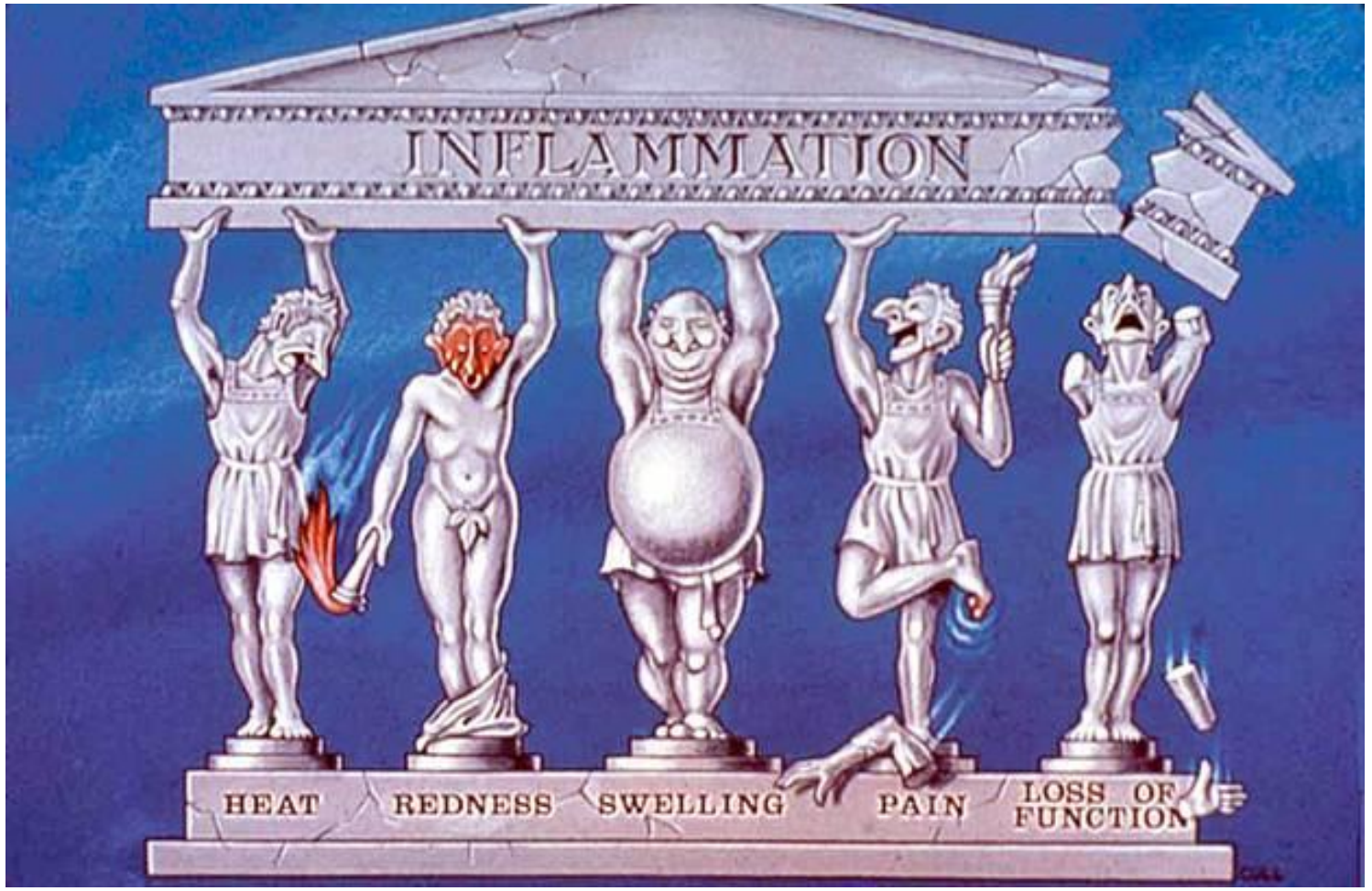
Fred L. Metzger DVM, MRCVS, DABVP

Dennis B. DeNicola DVM, PhD, DACVP

Laboratory Retrievers

Animals can't hide their objective data

The Clinical Pathology Olympics!



Calore Rubor Tumor Dalore

Laboratory Retrievers
Animals can't hide their objective data

The Laboratory Retriever Team

Alan H. Rebar, DVM, PhD, DACVP

Dennis B. DeNicola, DVM, PhD, DACVP

Fred Metzger, DVM, MRCVS, DABVP

Clinical Case - Libby

Libby

Signalment

- 12 yr, Fs, Chihuahua mix

Presenting Complaints

- Cranial abdominal pain
- Heart mumur 3/6

History

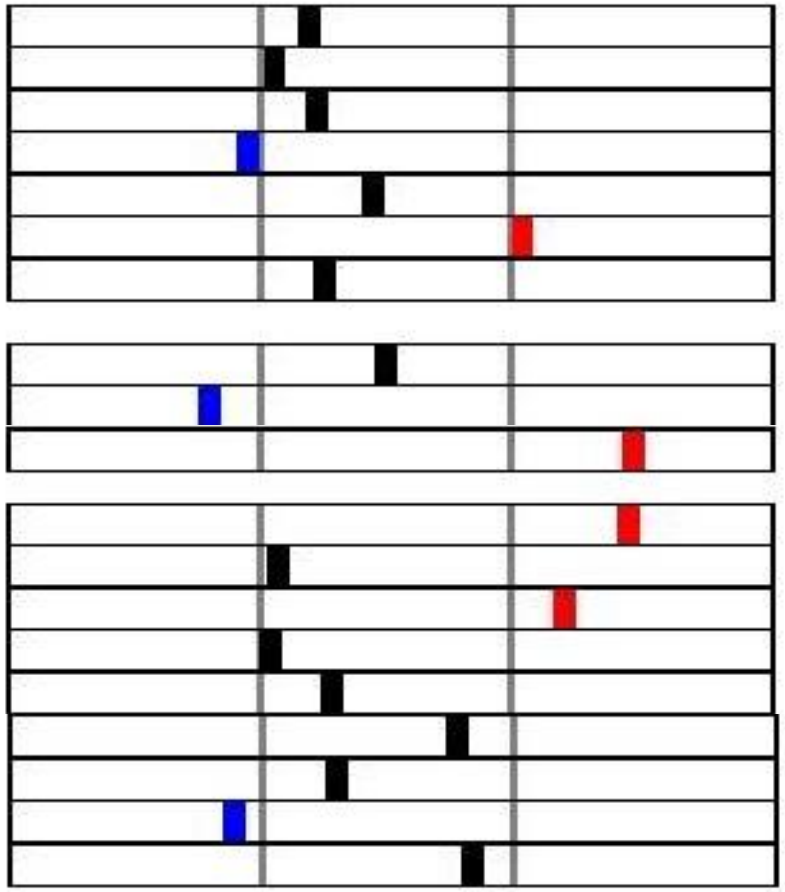
- ADR over the past 24 hours
- Vomiting the morning before presentation
- Owner reports a few ‘accidents’ in the house

The Data

- Printed copy of data and questions given to teams
- After 5-10 minutes the LRs review the data using PPT

First independent review – The data

Test	Results	Reference Interval	LOW / NORMAL / HIGH
ProCyte Dx (December 3, 2019 2:46 PM)			
RBC	6.33 M/µL	5.65 - 8.87	
HCT	38.8 %	37.3 - 61.7	
HGB	14.8 g/dL	13.1 - 20.5	
MCV	61.3 fL	61.6 - 73.5	LOW
MCH	23.4 pg	21.2 - 25.9	
MCHC	38.1 g/dL	32.0 - 37.9	HIGH
RDW	15.8 %	13.6 - 21.7	
%RETIC	1.0 %		
RETIC	61.4 K/µL	10.0 - 110.0	
RETIC-HGB	19.9 pg	22.3 - 29.6	LOW
WBC	28.03 K/µL	5.05 - 16.76	HIGH
NEU	24.80 K/µL	2.95 - 11.64	HIGH
LYM	1.38 K/µL	1.05 - 5.10	
MONO	1.73 K/µL	0.16 - 1.12	HIGH
EOS	0.09 K/µL	0.06 - 1.23	
BASO	0.03 K/µL	0.00 - 0.10	
PLT	408 K/µL	148 - 484	
MPV	10.1 fL	8.7 - 13.2	
PDW	8.3 fL	9.1 - 19.4	LOW
PCT	0.41 %	0.14 - 0.46	



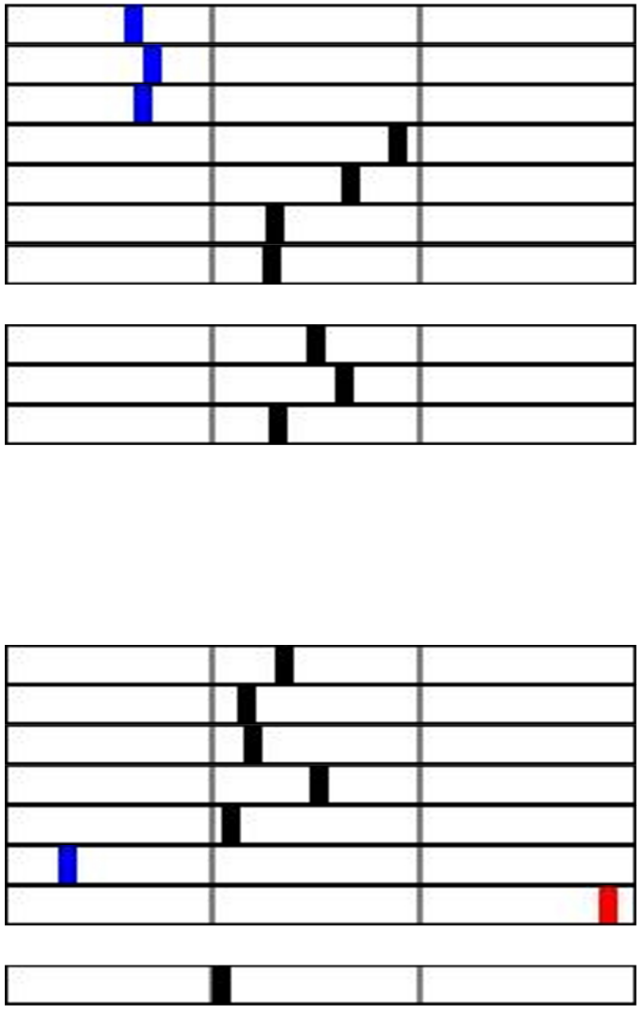
Complete Blood Count

Erythrogram
- RBC mass
- RBC morphology
- Objective measure of BM response Fe availability

Leukogram
- WBC mass
- WBC relative distribution
- WBC absolute distribution

Thrombogram
- PLT mass
- PLT morphology
- PLT mass

RBC	4.30 M/µL	5.65 - 8.87	LOW	
HCT	31.1 %	37.3 - 61.7	LOW	
HGB	10.5 g/dL	13.1 - 20.5	LOW	
MCV	72.3 fL	61.6 - 73.5		
MCH	24.4 pg	21.2 - 25.9		
MCHC	33.8 g/dL	32.0 - 37.9		
RDW	16.0 %	13.6 - 21.7		
%RETIC	1.4 %			
RETIC	61.5 K/µL	10.0 - 110.0		
RETIC-HGB	27.0 pg	22.3 - 29.6		
WBC	8.81 K/µL	5.05 - 16.76		
%NEU	68.0 %			
%LYM	20.2 %			
%MONO	4.1 %			
%EOS	7.6 %			
%BASO	0.1 %			
NEU	5.99 K/µL	2.95 - 11.64		
LYM	1.78 K/µL	1.05 - 5.10		
MONO	0.36 K/µL	0.16 - 1.12		
EOS	0.67 K/µL	0.06 - 1.23		
BASO	0.01 K/µL	0.00 - 0.10		
PLT	* 63 K/µL	148 - 484	LOW	
MPV	23.7 fL	8.7 - 13.2	HIGH	
PDW	--.-- fL	9.1 - 19.4		
PCT	0.15 %	0.14 - 0.46		



Laboratory Retrievers
Animals can't hide their objective data

Time to take part!

To take part in our interactive Q&A:

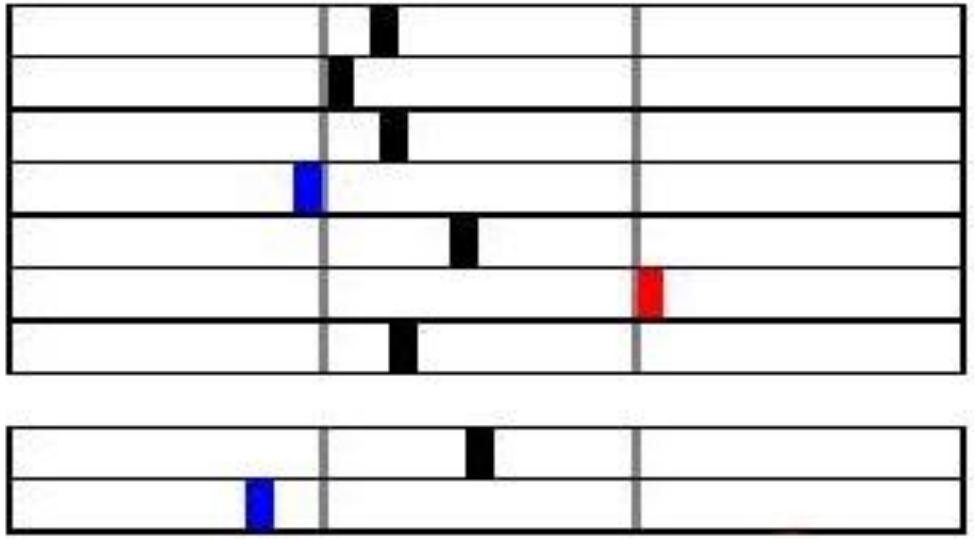
Scan the QR code with your mobile device now.

Or join us at: slido.com

#4066499

Libby – 12 yr, Fs, Chihuahua mix

Test	Results	Reference Interval	LOW / NORMAL / HIGH
ProCyte Dx (December 3, 2019 2:46 PM)			
RBC	6.33 M/µL	5.65 - 8.87	
HCT	38.8 %	37.3 - 61.7	
HGB	14.8 g/dL	13.1 - 20.5	
MCV	61.3 fL	61.6 - 73.5	LOW
MCH	23.4 pg	21.2 - 25.9	
MCHC	38.1 g/dL	32.0 - 37.9	HIGH
RDW	15.8 %	13.6 - 21.7	
%RETIC	1.0 %		
RETIC	61.4 K/µL	10.0 - 110.0	
RETIC-HGB	19.9 pg	22.3 - 29.6	LOW



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Do not edit
How to change the design

What is the best primary interpretation for Libby's erythrogram DATA? (Choose all that apply)

ⓘ The Slido app must be installed on every computer you're presenting from

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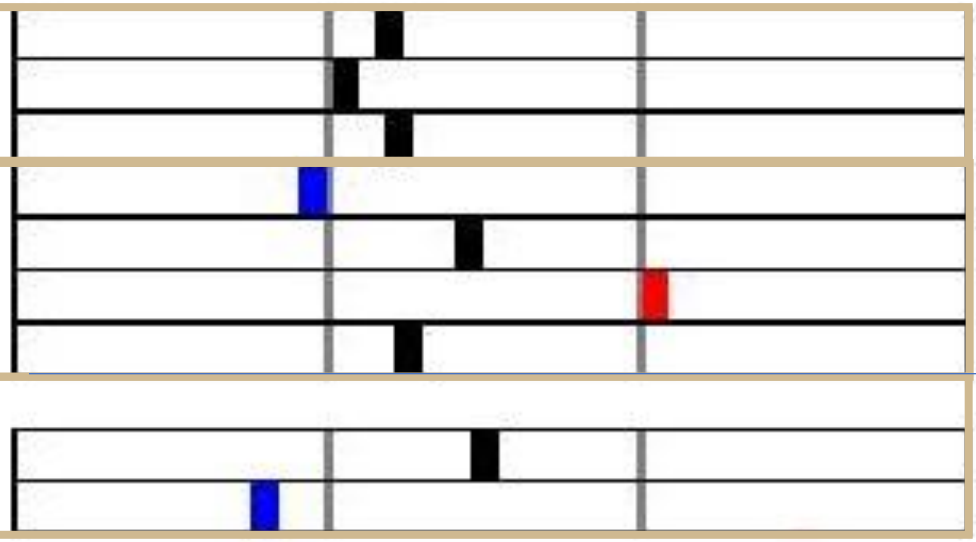
Libby – 12 yr, Fs, Chihuahua mix

Test	Results	Reference Interval	LOW / NORMAL / HIGH
ProCyte Dx (December 3, 2019 2:46 PM)			
RBC	6.33 M/µL	5.65 - 8.87	
HCT	38.8 %	37.3 - 61.7	
HGB	14.8 g/dL	13.1 - 20.5	
MCV	61.3 fL	61.6 - 73.5	LOW
MCH	23.4 pg	21.2 - 25.9	
MCHC	38.1 g/dL	32.0 - 37.9	HIGH
RDW	15.8 %	13.6 - 21.7	
%RETIC	1.0 %		
RETIC	61.4 K/µL	10.0 - 110.0	
RETIC-HGB	19.9 pg	22.3 - 29.6	LOW

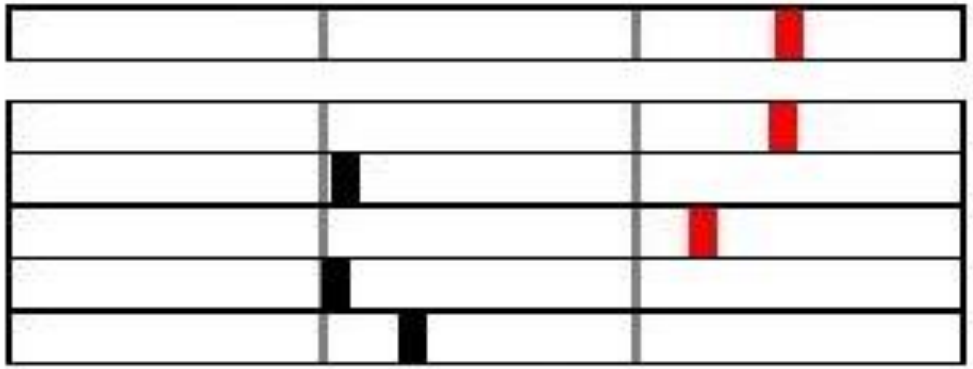


Low normal RBC mass
Microcytosis and hyperchromasia
Normal RETIC and low RETIC-HGB

Laboratory Retrievers
Animals can't hide their objective data

Libby – 12 yr, Fs, Chihuahua mix

Test	Results	Reference Interval	LOW / NORMAL / HIGH
ProCyte Dx (December 3, 2019 2:46 PM)			
WBC	28.03 K/µL	5.05 - 16.76	HIGH
NEU	24.80 K/µL	2.95 - 11.64	HIGH
LYM	1.38 K/µL	1.05 - 5.10	
MONO	1.73 K/µL	0.16 - 1.12	HIGH
EOS	0.09 K/µL	0.06 - 1.23	
BASO	0.03 K/µL	0.00 - 0.10	



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What is the best interpretation for Libby's leukogram DATA?

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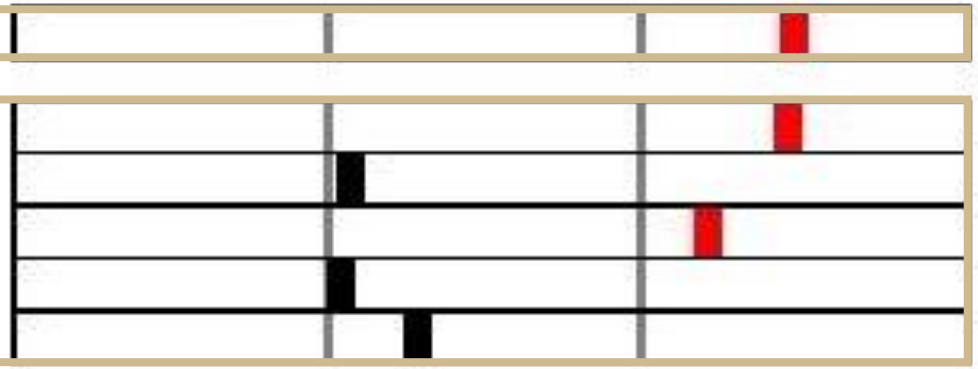
Libby – 12 yr, Fs, Chihuahua mix

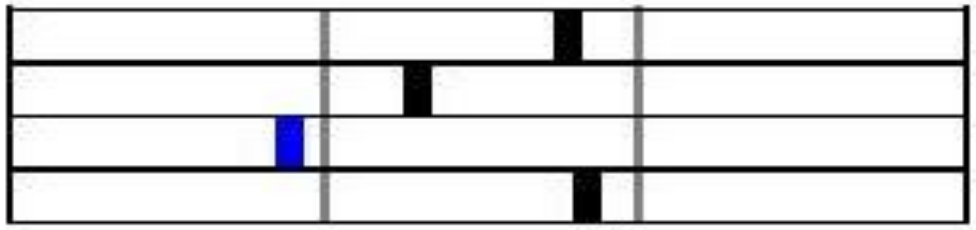
Test	Results	Reference Interval	LOW / NORMAL / HIGH
ProCyte Dx (December 3, 2019 2:46 PM)			
WBC	28.03 K/µL	5.05 - 16.76	HIGH
NEU	24.80 K/µL	2.95 - 11.64	HIGH
LYM	1.38 K/µL	1.05 - 5.10	
MONO	1.73 K/µL	0.16 - 1.12	HIGH
EOS	0.09 K/µL	0.06 - 1.23	
BASO	0.03 K/µL	0.00 - 0.10	



Mild to moderate leukocytosis
Mild to moderate neutrophilia
Low within RI lymphocytes and eosinophils
Minimal monocytosis

Libby – 12 yr, Fs, Chihuahua mix

Test	Results	Reference Interval	LOW	NORMAL	HIGH
ProCyte Dx (December 3, 2019 2:46 PM)					
PLT	408 K/µL	148 - 484			
MPV	10.1 fL	8.7 - 13.2			
PDW	8.3 fL	9.1 - 19.4	LOW		
PCT	0.41 %	0.14 - 0.46			



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What is the best interpretation for Libby's decreased PDW?

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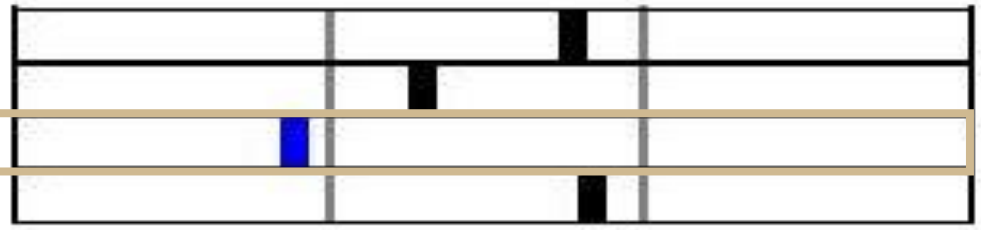
Libby – 12 yr, Fs, Chihuahua mix

Test	Results	Reference Interval	LOW	NORMAL	HIGH
ProCyte Dx (December 3, 2019 2:46 PM)					
PLT	408 K/µL	148 - 484			
MPV	10.1 fL	8.7 - 13.2			
PDW	8.3 fL	9.1 - 19.4	LOW		
PCT	0.41 %	0.14 - 0.46			



Mild insignificant decreased PDW

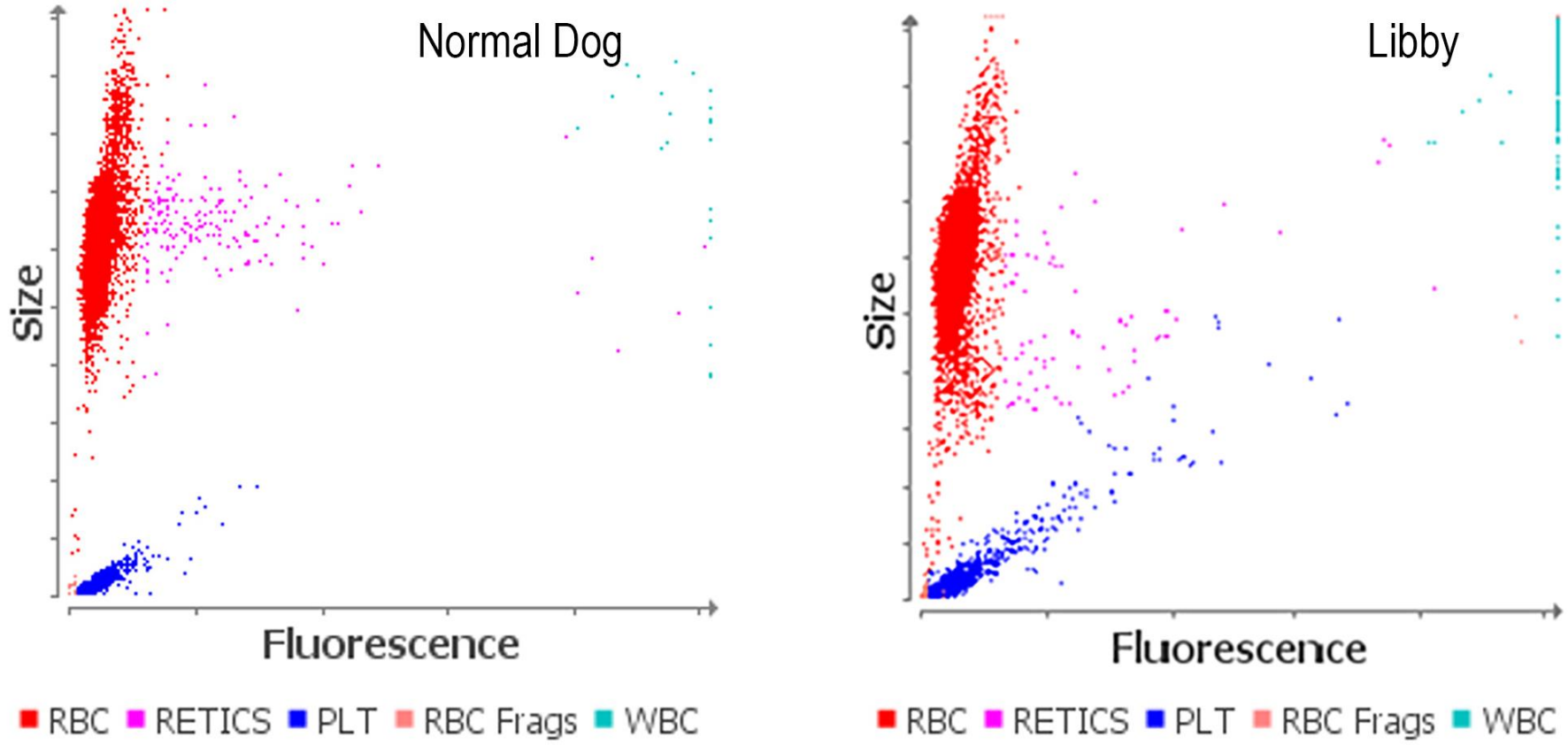
The Dot Plots

- Printed copy of dot plots and questions given to teams
- After 5-10 minutes the LRs review the dot plots using PPT

- General questions to answer:
  1. Does my patient dot plot look like a representative normal dot plot?
  2. Can I trust the data: are the digitized events located where they should be?
  3. Are there any obvious quantitative abnormalities?
  4. Are there any obvious qualitative abnormalities?

The RBC/PLT Dot Plot

RBC/PLT Dot Plots



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Based on the RBC/PLT Dot Plot: Does my patient dot plot look like a representative normal dot plot?

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Based on the RBC/PLT Dot Plot: Can I trust the data – are the digitized events located where they should be?

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Based on the RBC/PLT Dot Plot: Are there any obvious quantitative abnormalities?

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Based on the RBC/PLT Dot Plot: Are there any obvious quantitative abnormalities?

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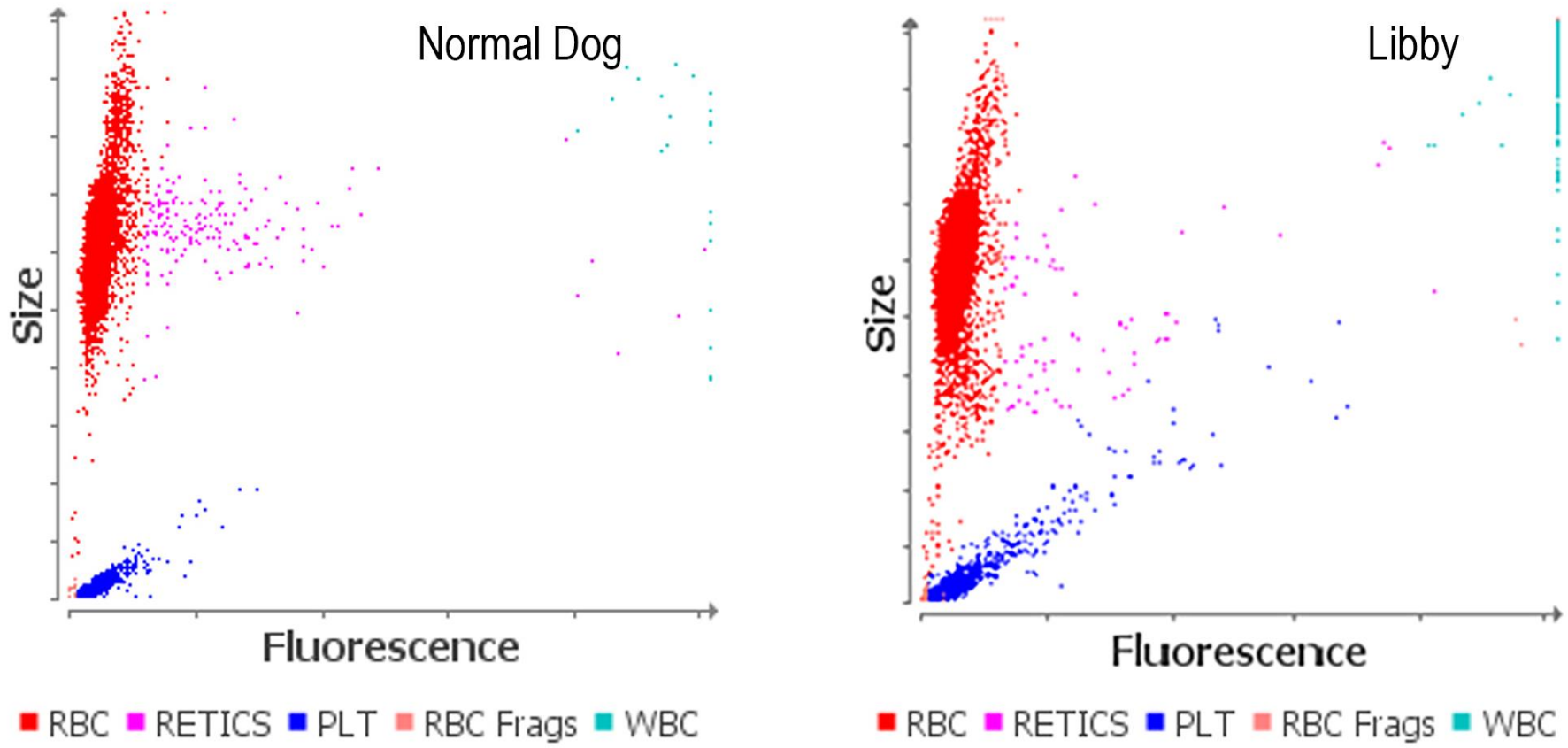
The RBC/PLT Dot Plot

RBC/PLT Dot Plots



Laboratory Retrievers
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What is/are the primary overall interpretation(s) of Libby's RBC/PLT dot plot changes? (Select all correct statements)

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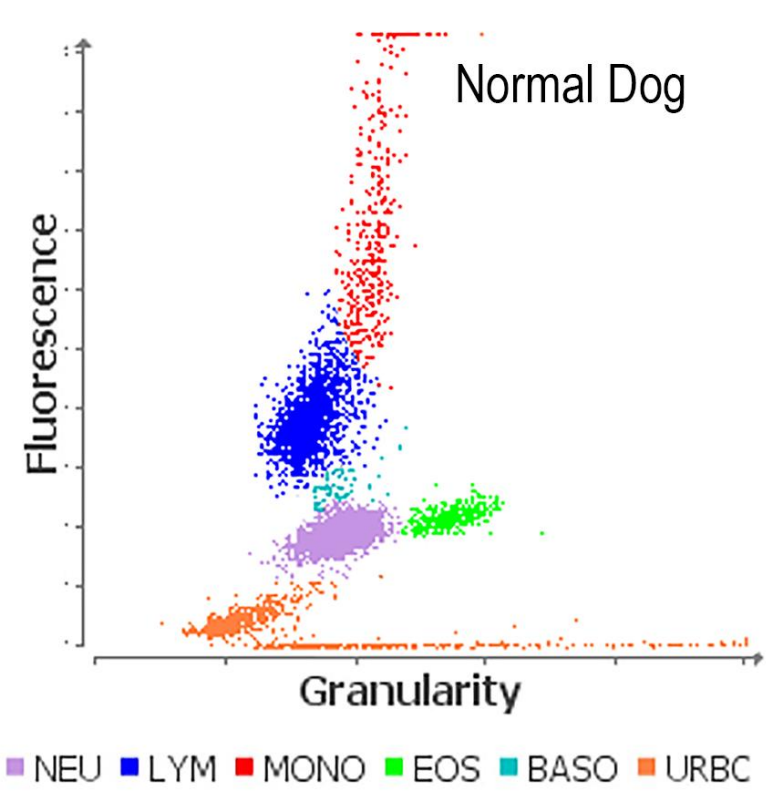
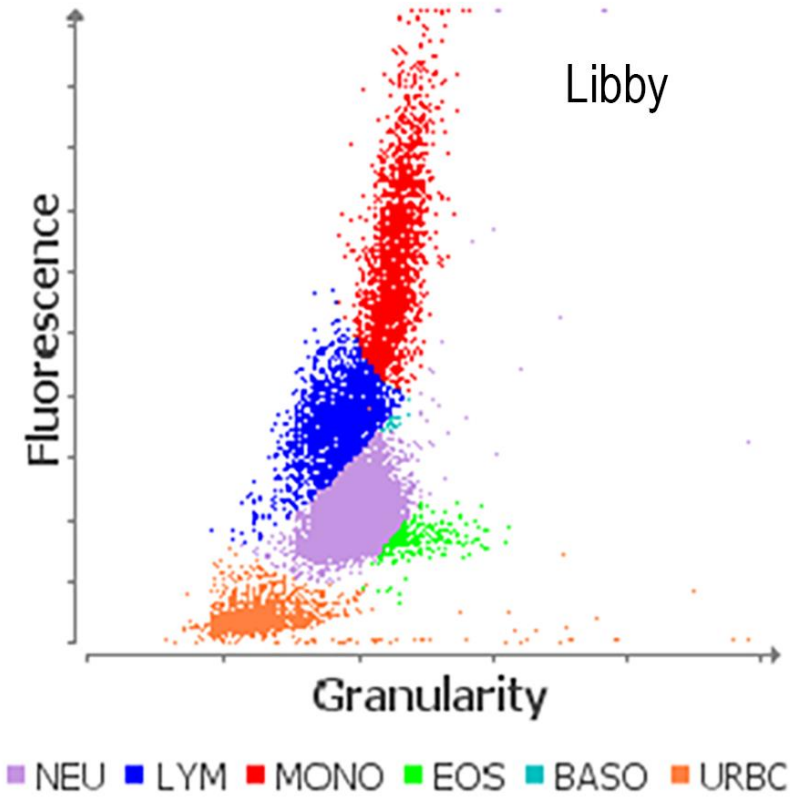
The WBC Dot Plot

WBC Dot Plots





Laboratory Retrievers
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Do not edit
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Based on the WBC Dot Plot: Does my patient dot plot look like a representative normal dot plot?

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Do not edit
How to change the design

Based on the WBC Dot Plot: Can I trust the data: are the digitized events located where they should be?

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Do not edit
How to change the design

Based on the WBC Dot Plot: Are there any obvious quantitative abnormalities?

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Do not edit
How to change the design

Based on the WBC Dot Plot: Are there any obvious qualitative abnormalities?

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Do not edit
How to change the design

What is/are the primary overall interpretation(s) of Libby's WBC dot plot changes? (Select all correct statements)

ⓘ The Slido app must be installed on every computer you're presenting from

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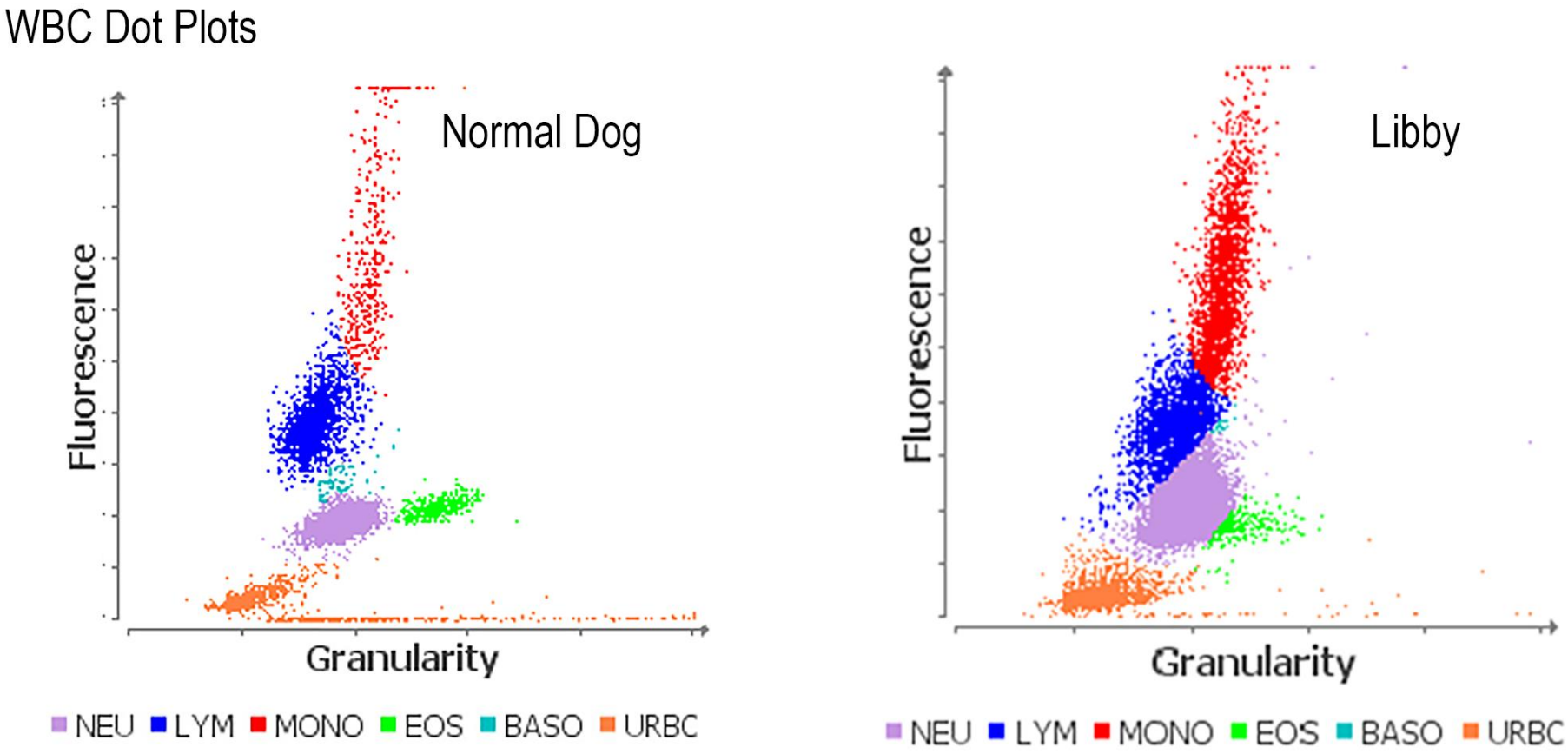
The WBC Dot Plot



Laboratory Retrievers
Animals can't hide their objective data

What is included in a complete blood count

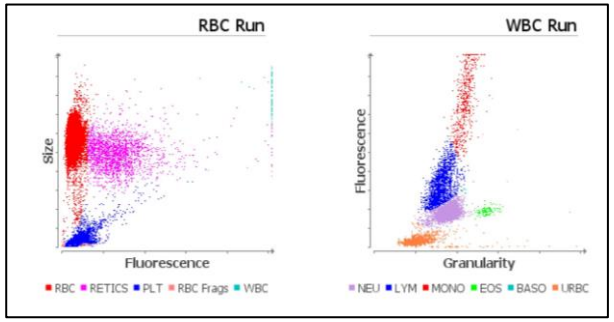
Three basic components

Analyzer data

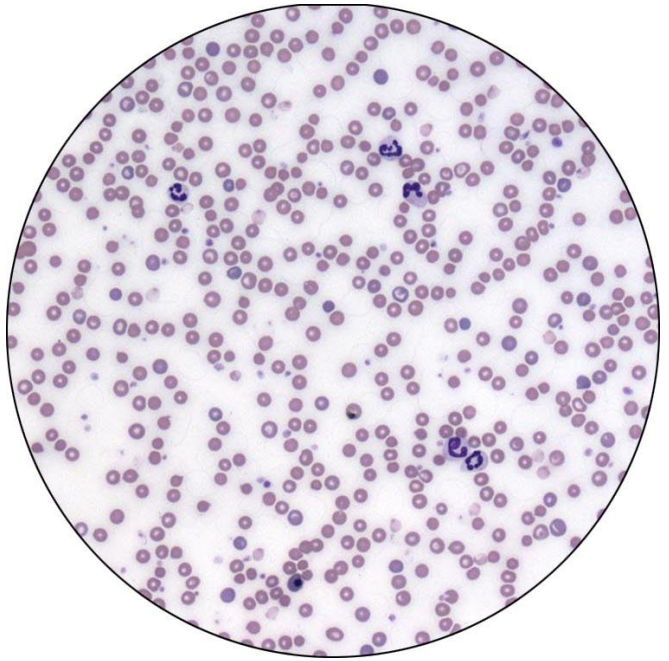
Test	Results	Reference Interval	LOW / NORMAL / HIGH
ProCyte Dx (September 30, 2016 9:20 AM)			
RBC	3.12 M/µL	5.65 - 8.87	LOW
HCT	23.3 %	37.3 - 61.7	LOW
HGB	7.8 g/dL	13.1 - 20.5	LOW
MCV	74.7 fL	61.6 - 73.5	HIGH
MCH	25.0 pg	21.2 - 25.9	
MCHC	33.5 g/dL	32.0 - 37.9	
RDW	18.0 %	13.6 - 21.7	
%RETIC	10.9 %		
RETIC	338.8 K/µL	10.0 - 110.0	HIGH
WBC	* 11.56 K/µL	5.05 - 16.76	
%NEU	* 72.7 %		
%LYM	* 20.3 %		
%MONO	* 5.7 %		
%EOS	* 1.2 %		
%BASO	* 0.1 %		
NEU	* 8.40 K/µL	2.95 - 11.64	
LYM	* 2.35 K/µL	1.05 - 5.10	
MONO	* 0.66 K/µL	0.16 - 1.12	
EOS	* 0.14 K/µL	0.06 - 1.23	
BASO	* 0.01 K/µL	0.00 - 0.10	
nRBC	* Suspected		
PLT	238 K/µL	148 - 484	
MPV	12.1 fL	8.7 - 13.2	
PDW	22.0 fL	9.1 - 19.4	HIGH
PCT	0.29 %	0.14 - 0.46	

nRBCs suspected

Analyzer graphics



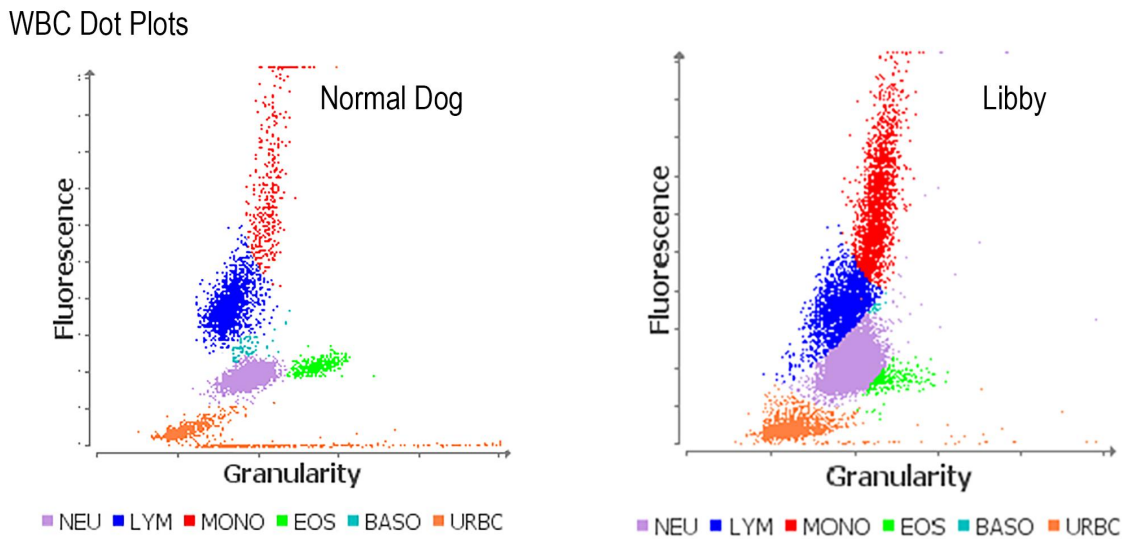
Blood film microscopic review



Laboratory Retrievers
Animals can't hide their objective data

Libby – 12 yr, Fs, Chihuahua mix

Test	Results	Reference Interval	LOW / NORMAL / HIGH
ProCyte Dx (December 3, 2019 2:46 PM)			
WBC	28.03 K/µL	5.05 - 16.76	HIGH
NEU	24.80 K/µL	2.95 - 11.64	HIGH
LYM	1.38 K/µL	1.05 - 5.10	
MONO	1.73 K/µL	0.16 - 1.12	HIGH
EOS	0.09 K/µL	0.06 - 1.23	
BASO	0.03 K/µL	0.00 - 0.10	

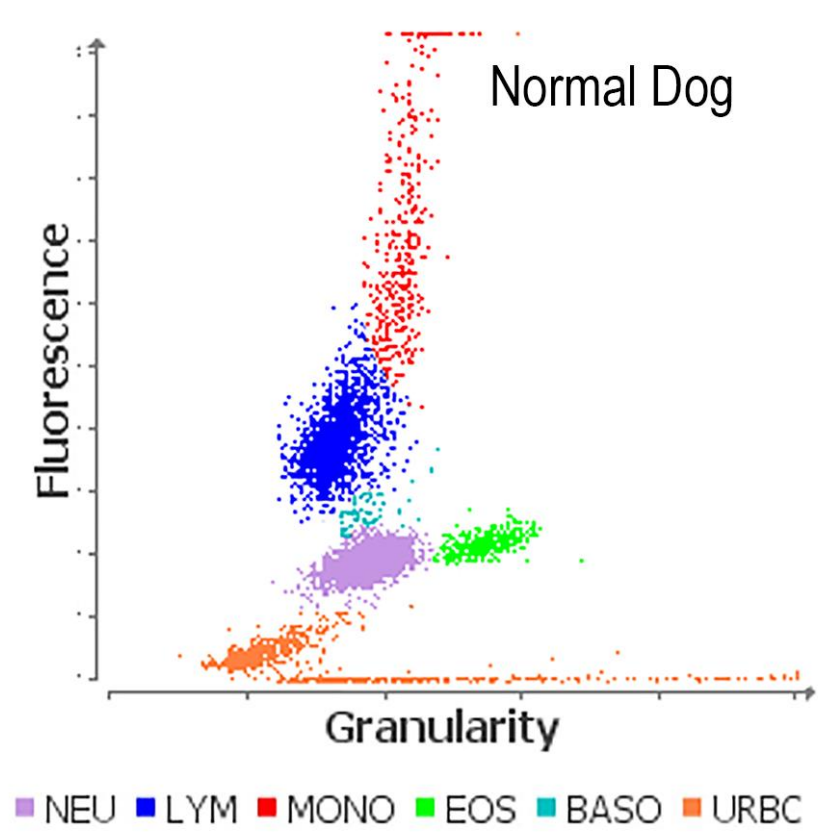


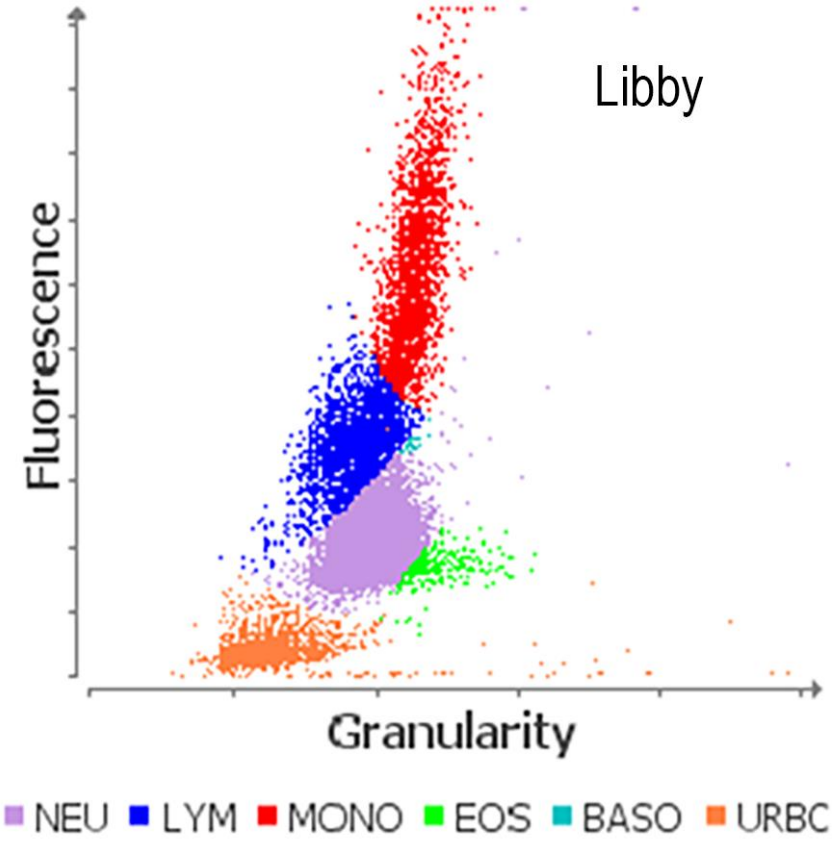
Although no flags or messages – data should be questioned

Laboratory Retrievers
Animals can't hide their objective data

Libby – 12 yr, Fs, Chihuahua mix

WBC Dot Plots





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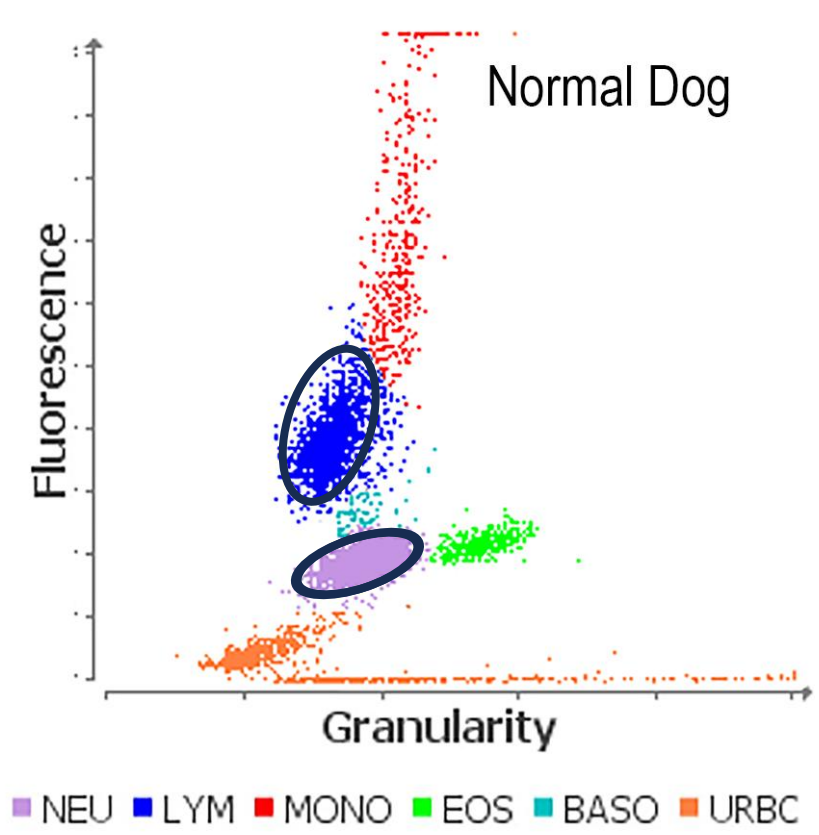
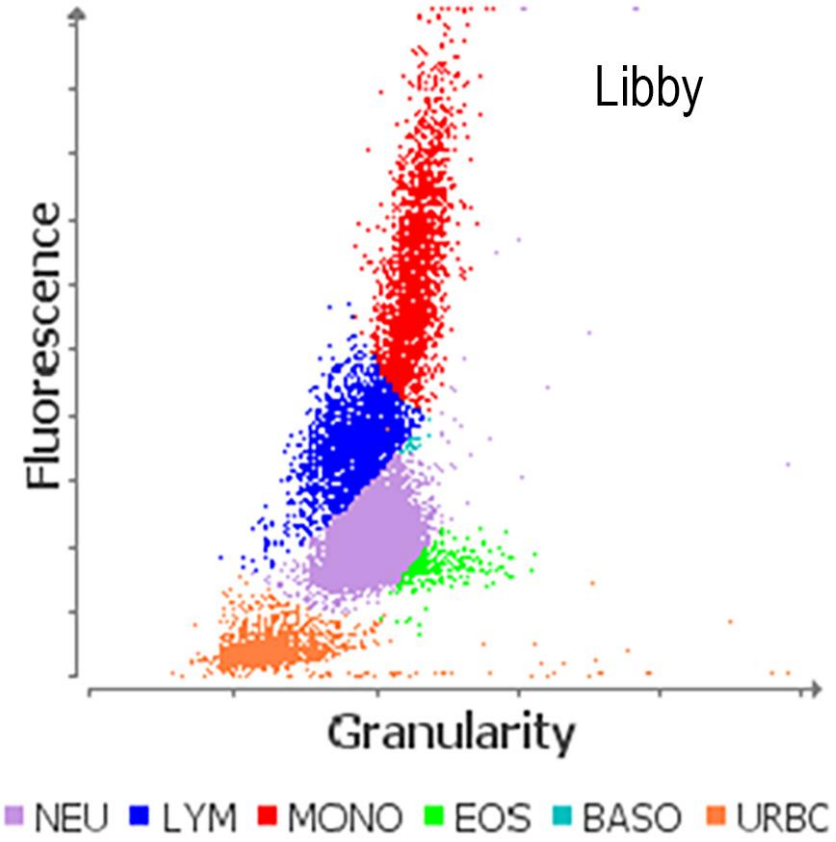
Libby – 12 yr, Fs, Chihuahua mix

WBC Dot Plots

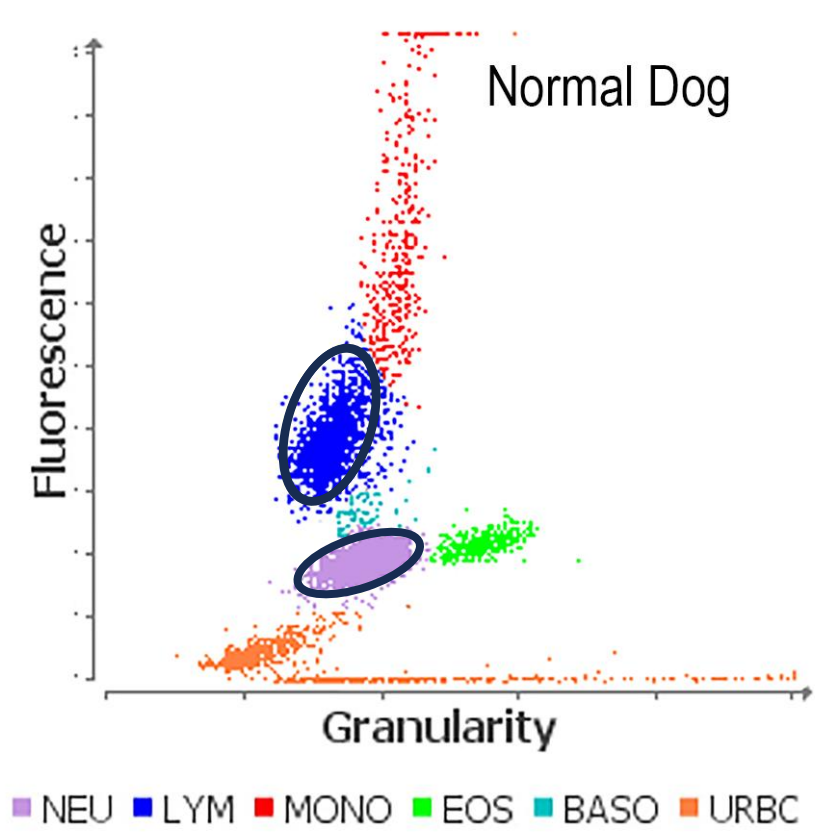


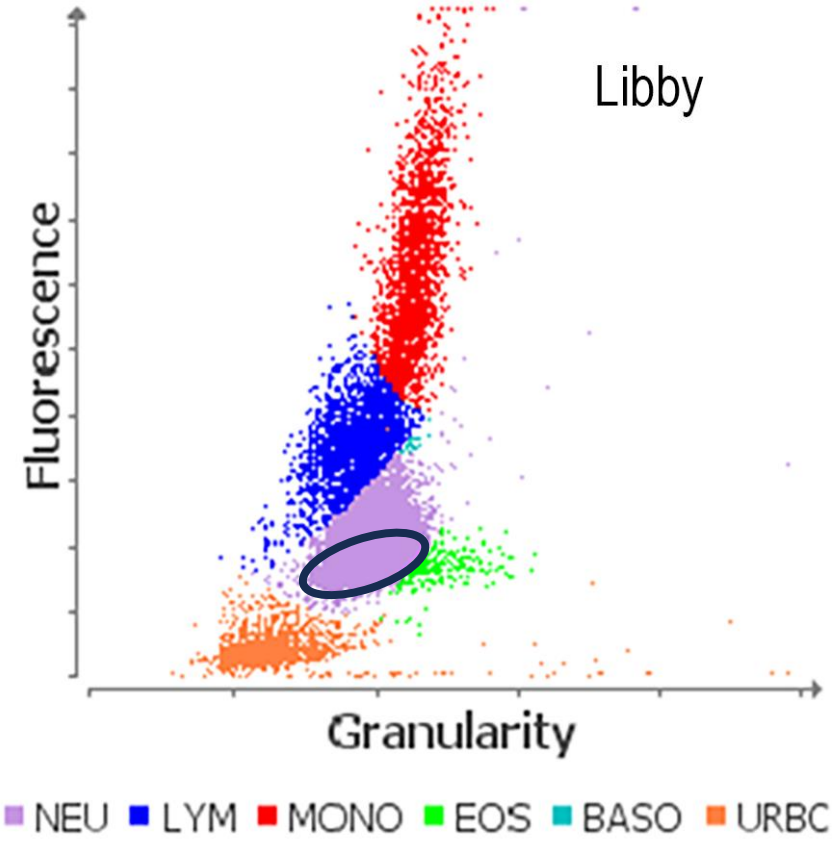


Animals can't hide their objective data

Libby – 12 yr, Fs, Chihuahua mix

WBC Dot Plots

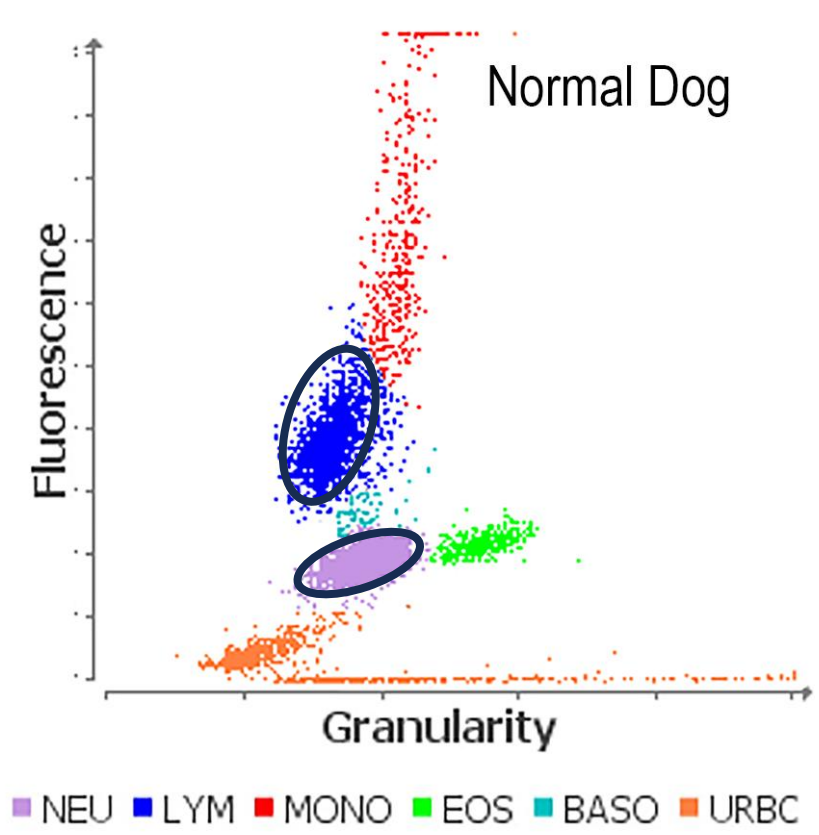


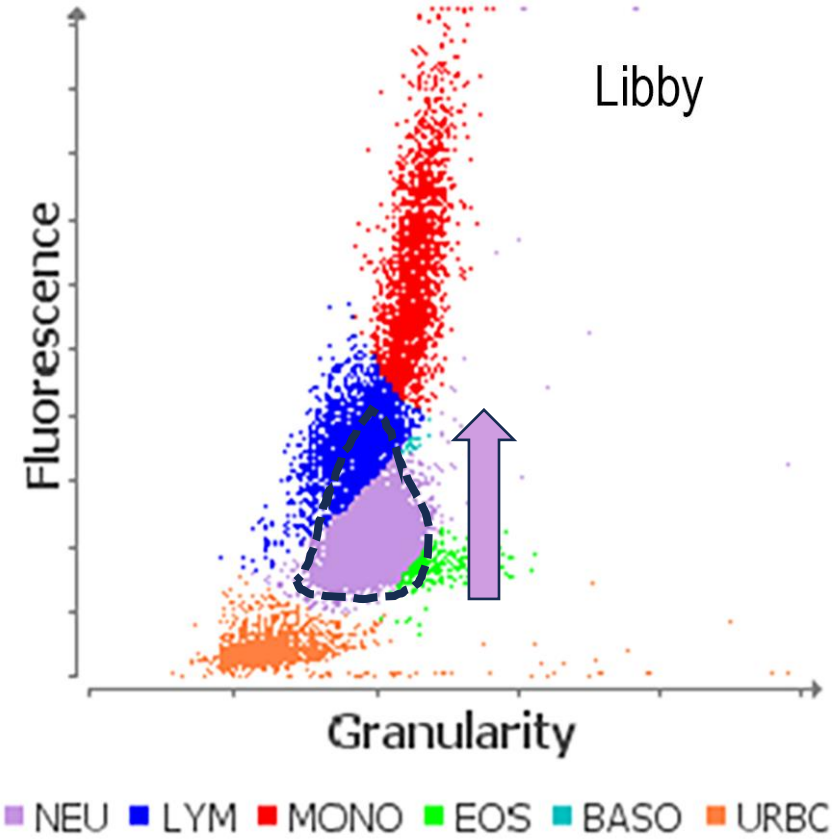


Animals can't hide their objective data

Libby – 12 yr, Fs, Chihuahua mix

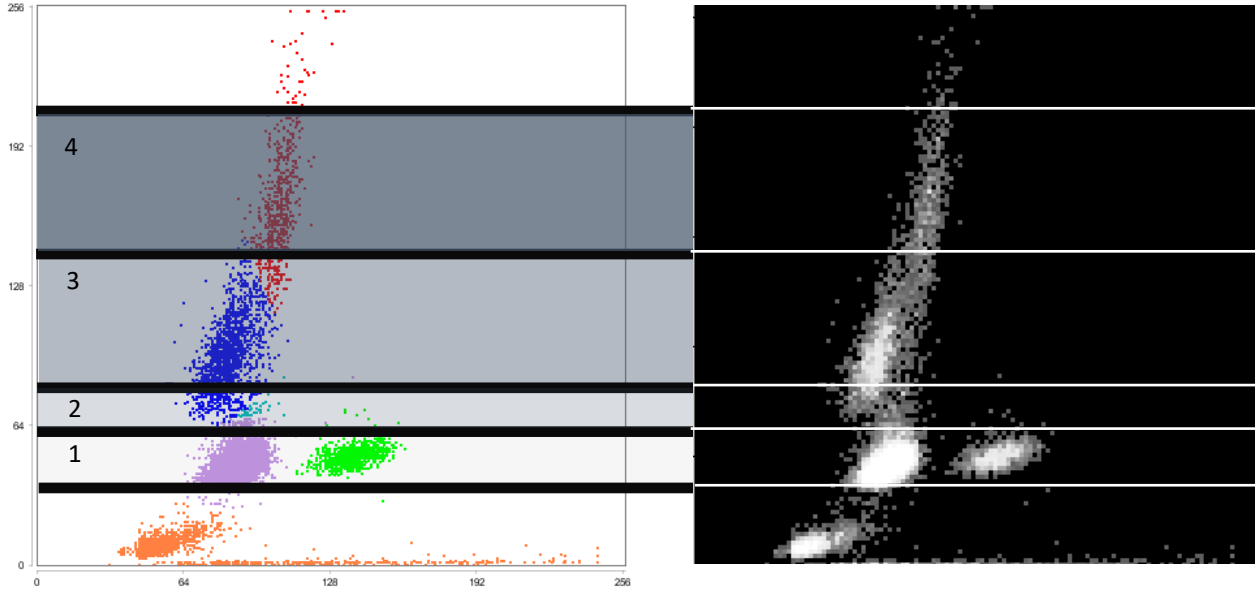
WBC Dot Plots





Animals can't hide their objective data

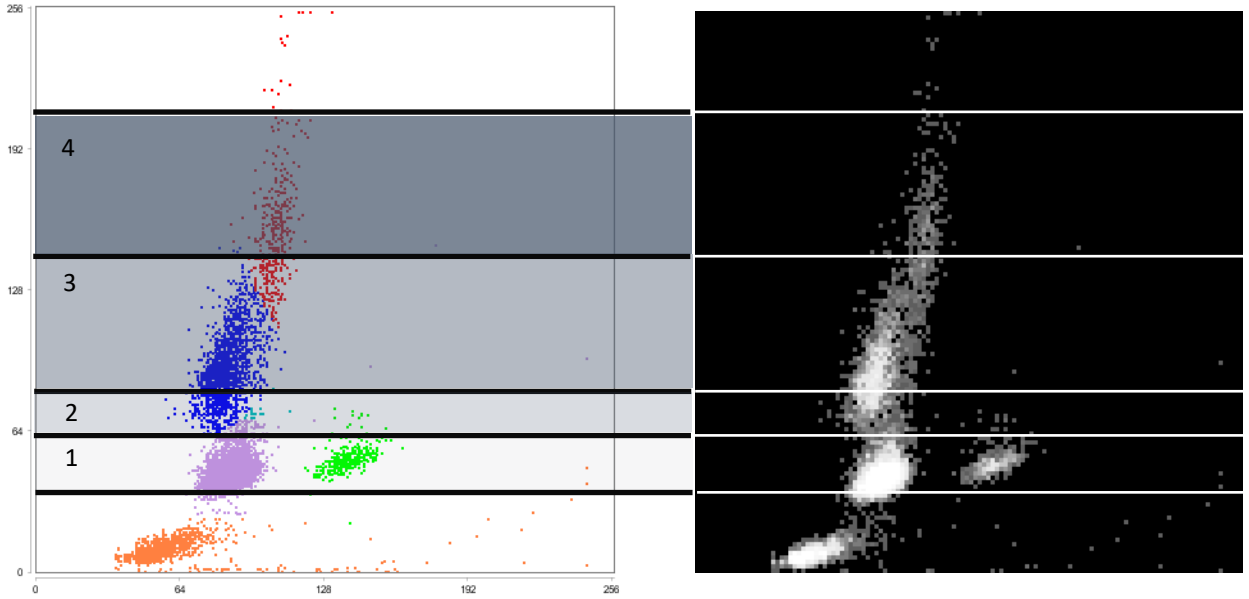
Degree of immature / toxic neutrophils



4 - Marked inflammation
3 - Moderate inflammation
2 - Minimal to mild inflammation
1 - Normal

Laboratory Retrievers
Animals can't hide their objective data

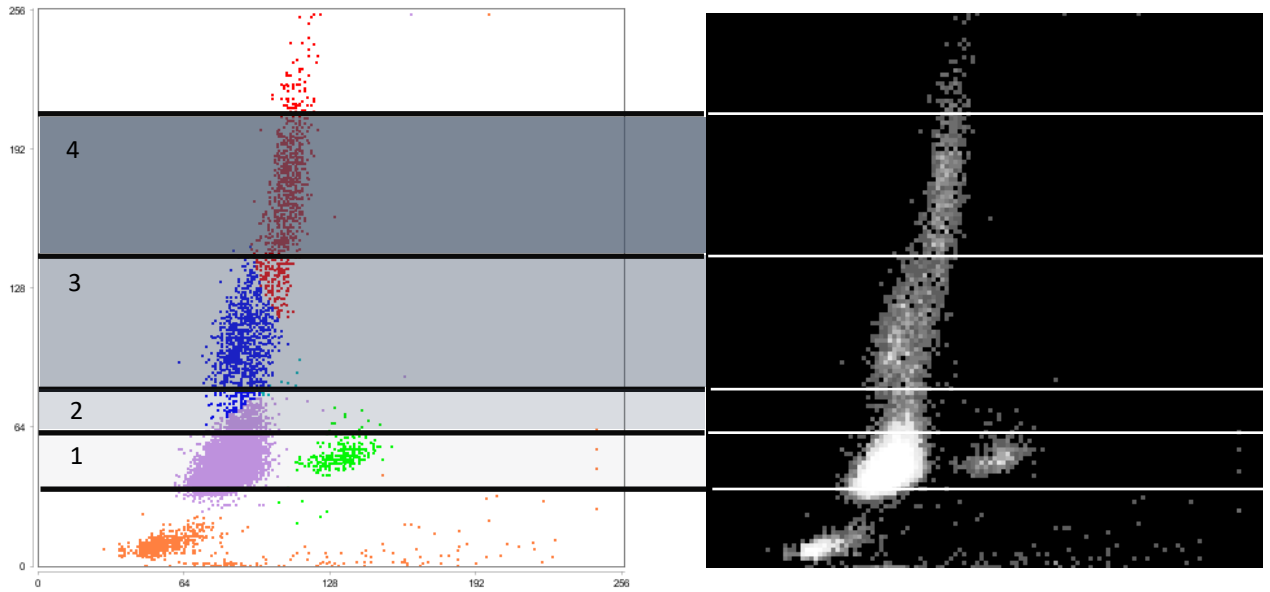
Canine - Normal



4 - Marked inflammation
3 - Moderate inflammation
2 - Minimal to mild inflammation
1 - Normal

Laboratory Retrievers
Animals can't hide their objective data

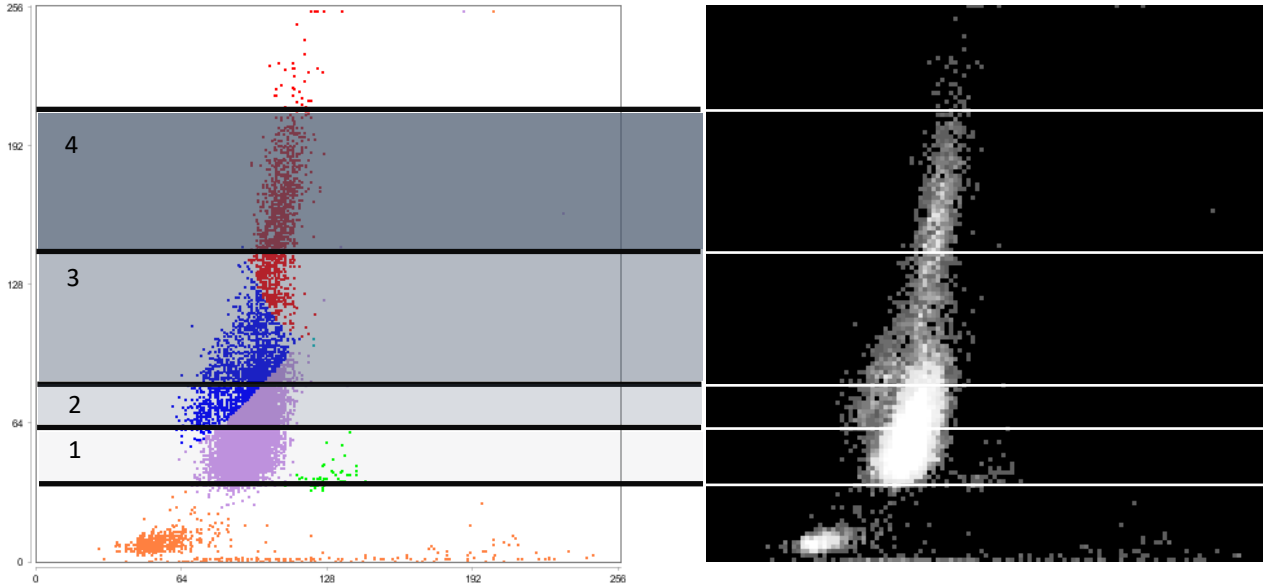
Canine – Mild inflammation



4 - Marked inflammation
3 - Moderate inflammation
2 - Minimal to mild inflammation
1 - Normal

Laboratory Retrievers
Animals can't hide their objective data

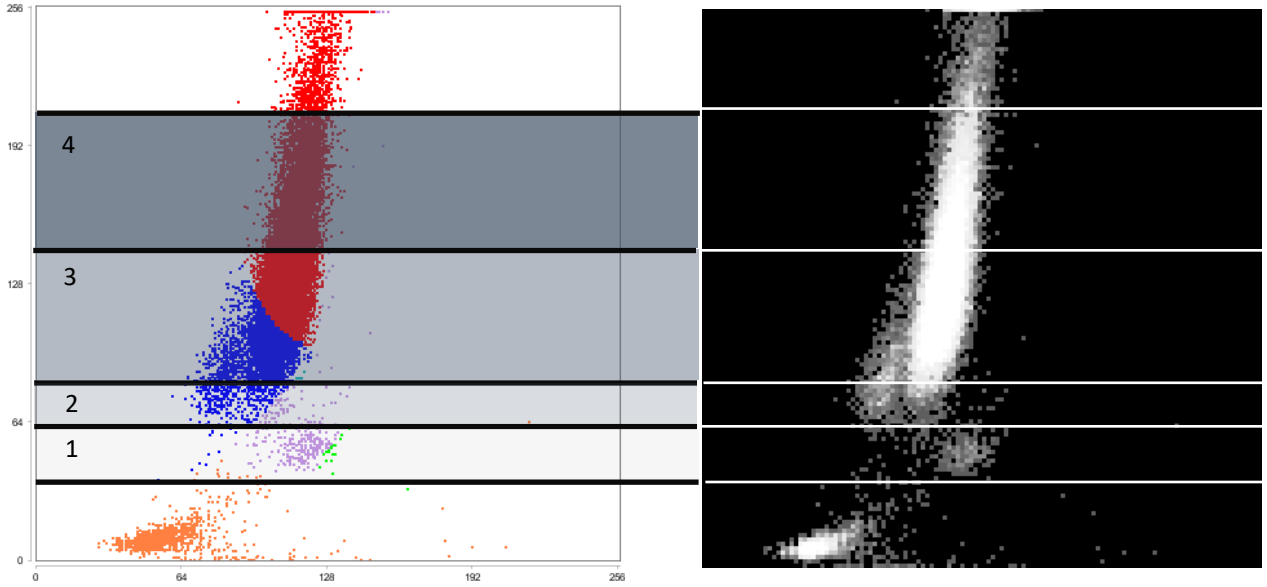
Canine – Moderate inflammation



4 - Marked inflammation
3 - Moderate inflammation
2 - Minimal to mild inflammation
1 - Normal

Laboratory Retrievers
Animals can't hide their objective data

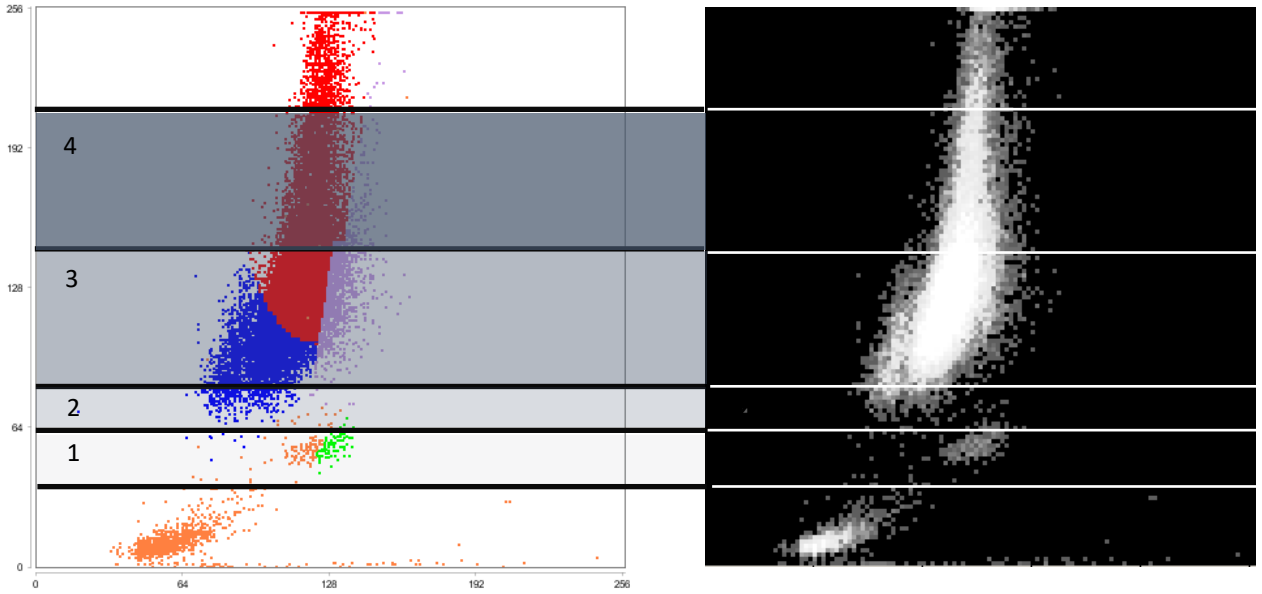
Canine –Marked inflammation



4 - Marked inflammation
3 - Moderate inflammation
2 - Minimal to mild inflammation
1 - Normal

Laboratory Retrievers
Animals can't hide their objective data

Canine –Marked inflammation

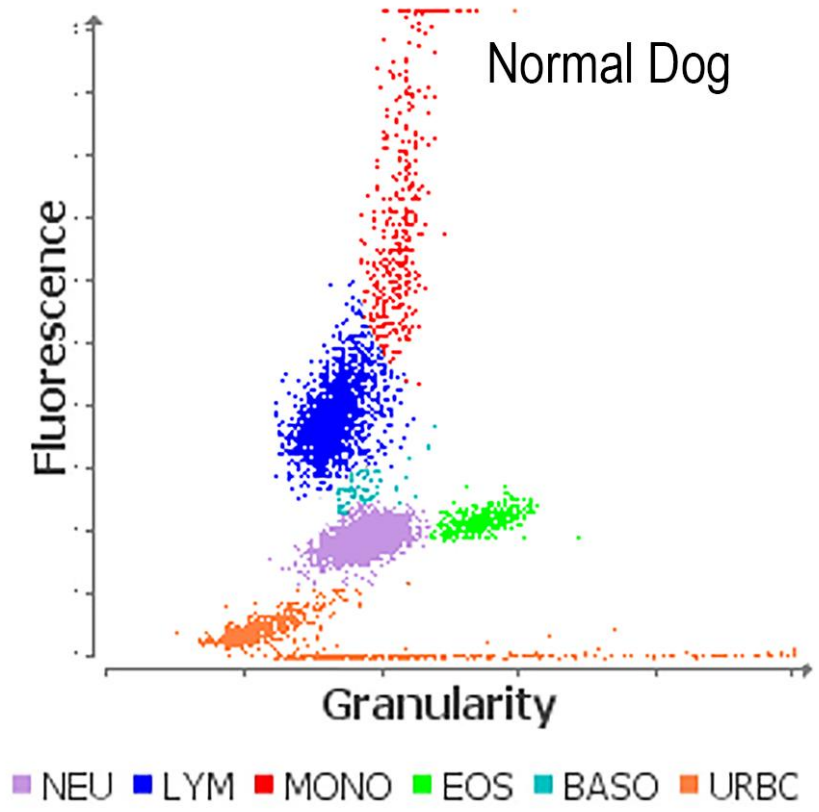


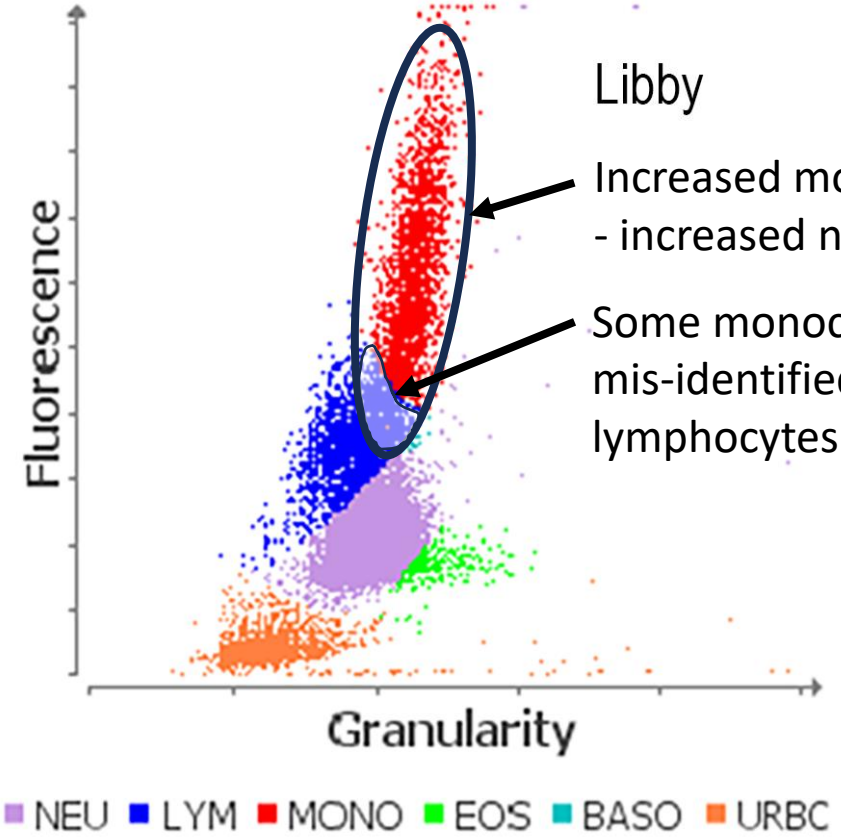
4 - Marked inflammation
3 - Moderate inflammation
2 - Minimal to mild inflammation
1 - Normal

Laboratory Retrievers
Animals can't hide their objective data

Libby – 12 yr, Fs, Chihuahua mix

WBC Dot Plots





Increased monocyte density - increased numbers

Some monocytes being mis-identified as lymphocytes

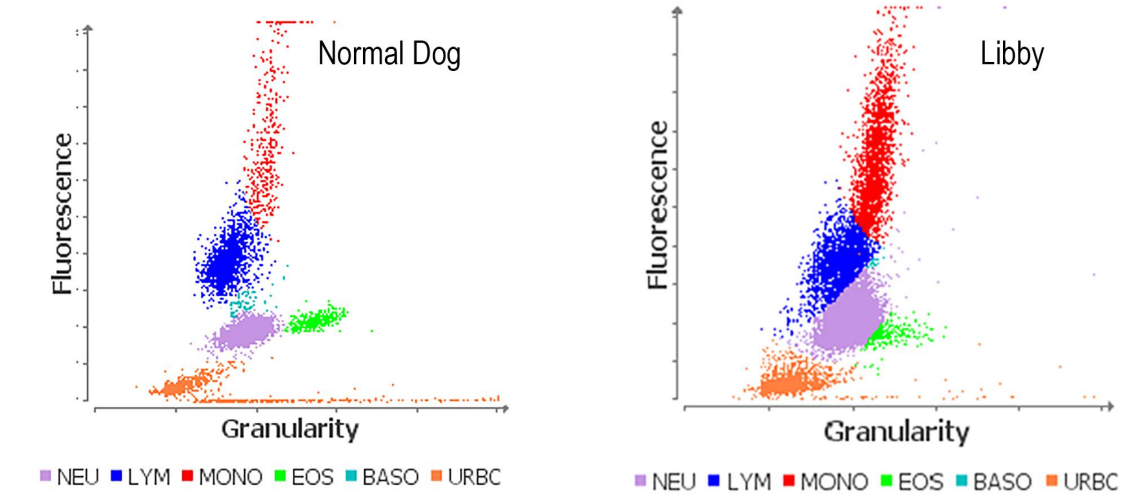
Animals can't hide their objective data

Libby – 12 yr, Fs, Chihuahua mix

Test	Results	Reference Interval	LOW	NORMAL	HIGH
ProCyte Dx (December 3, 2019 2:46 PM)					
WBC	28.03 K/µL	5.05 - 16.76	HIGH		
NEU	24.80 K/µL	2.95 - 11.64	HIGH		
LYM	1.38 K/µL	1.05 - 5.10			
MONO	1.73 K/µL	0.16 - 1.12	HIGH		
EOS	0.09 K/µL	0.06 - 1.23			
BASO	0.03 K/µL	0.00 - 0.10			

1. Lymphocytes and eosinophils are overestimated
2. Monocytes and neutrophils are underestimated
3. Likely presence of immature and/or toxic neutrophils

WBC Dot Plots



Laboratory Retrievers
Animals can't hide their objective data

Do not edit
How to change the design

Based on the Dot Plots: What is the best interpretation for Libby's CBC dot plots?

ⓘ The Slido app must be installed on every computer you're presenting from

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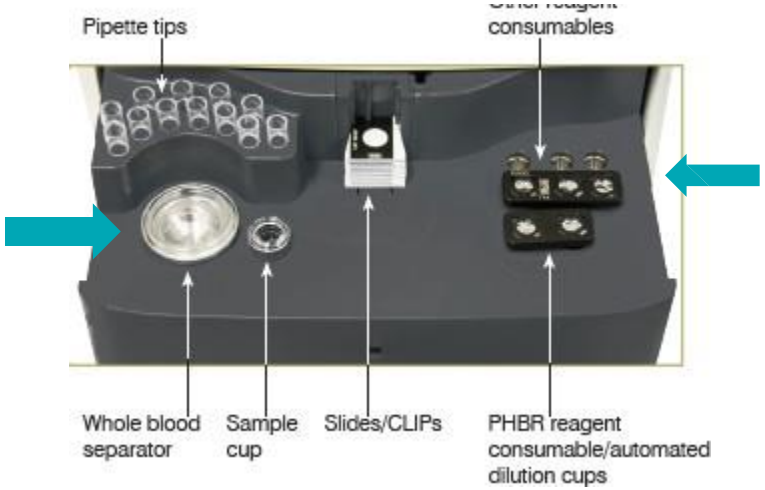
Acute phase protein measurements

Catalyst Dx

CRP	9.8 mg/dL	0.0 - 1.0	HIGH

C-Reactive Protein (CRP)
CRP concentrations >3.0 mg/dL indicate clinically significant systemic inflammation.



Laboratory Retrievers
Animals can't hide their objective data

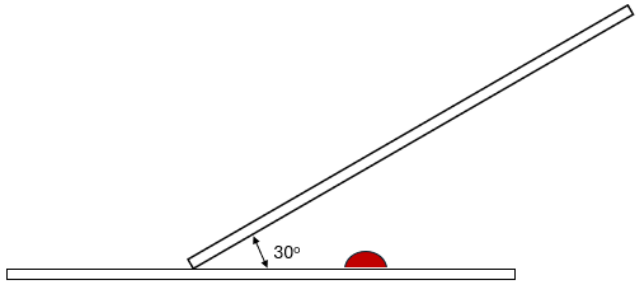
Libby – 12 yr, Fs, Chihuahua mix

- Urinalysis

OOPS

The Morphology

Application point



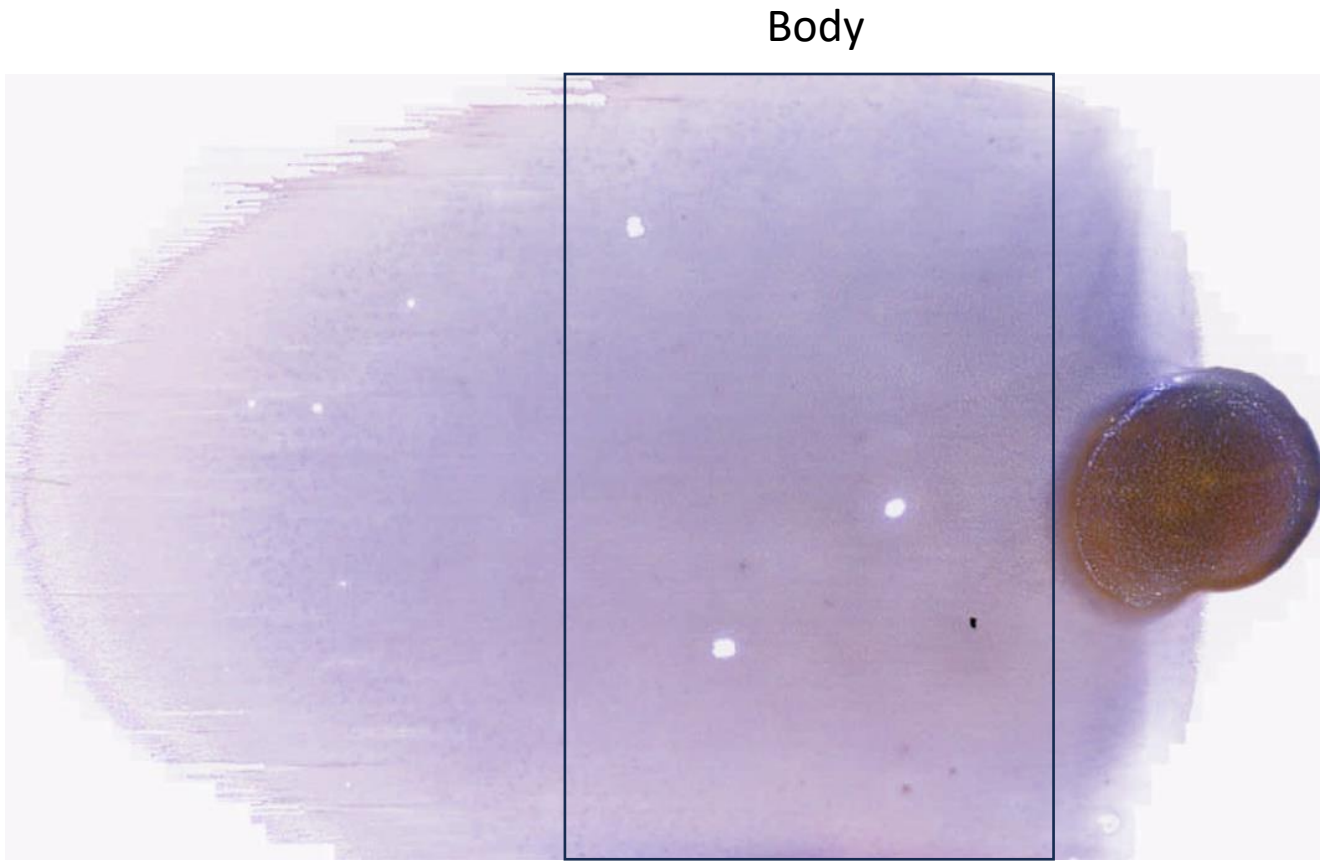
- Blood film
  - Well-mixed EDTA anti-coagulated blood
  - Back spreader slide to point of blood application
  - Smooth fluid motion towards the end of the slide
  - Don’t stop or lift spreader slide
  - Blood film should cover approximately 2 thirds the length of the slide

The Morphology

Feathered edge

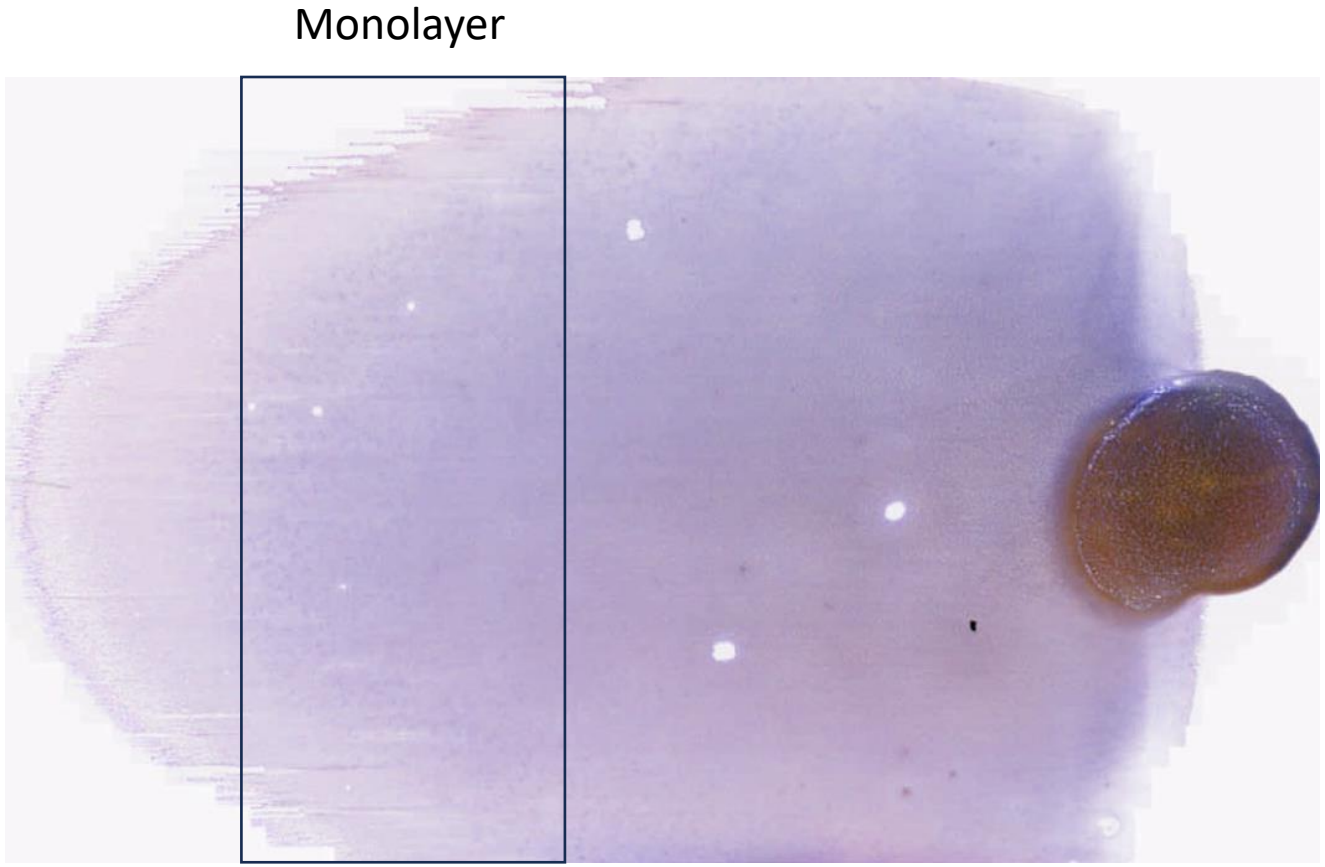
- Feathered edge
  - Leukocyte density
  - Leukocyte distribution
  - Large items
    - Platelet clumping
    - Abnormal cells
    - Microfilaria

The Morphology



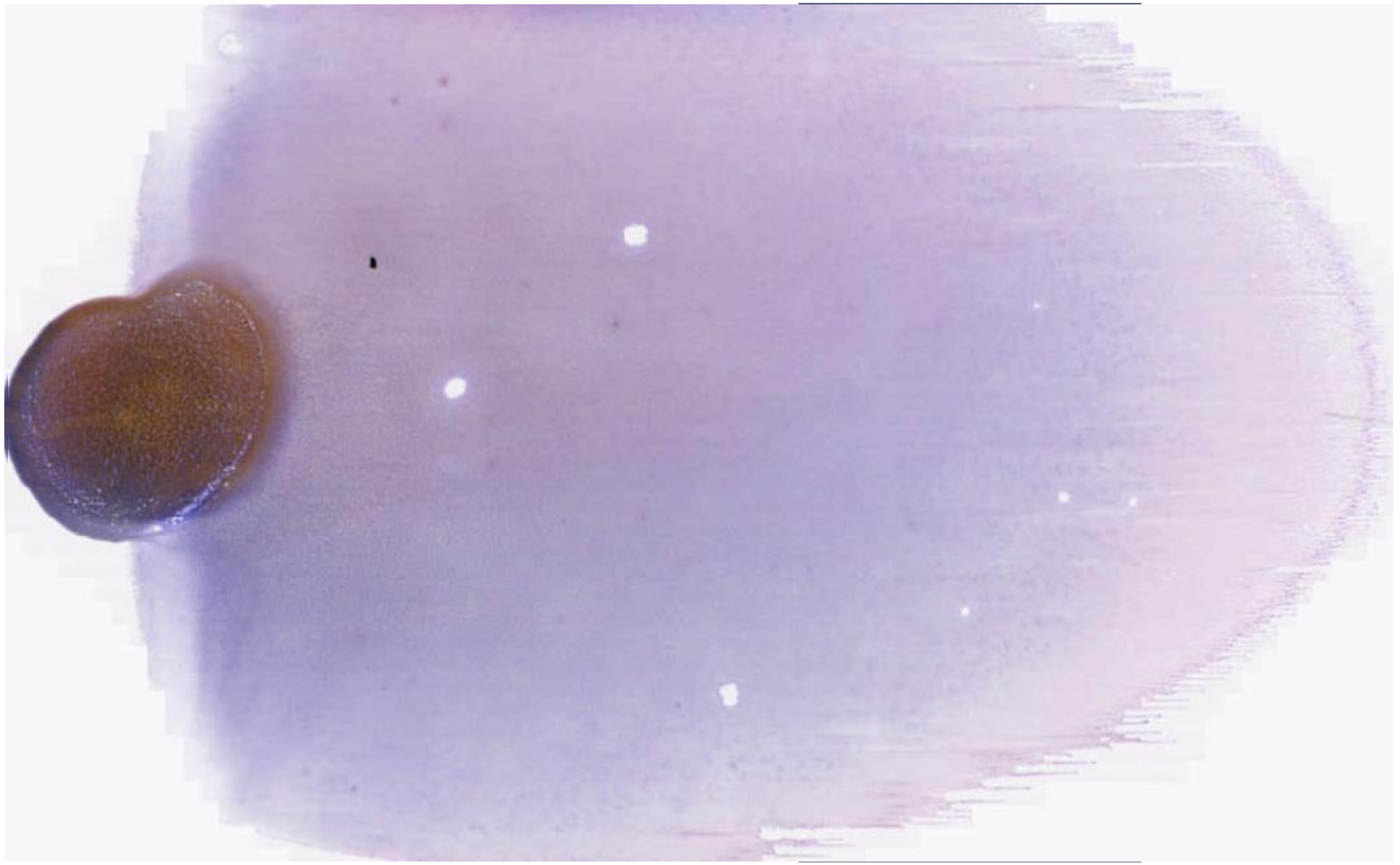
- Body
  - Rouleaux
  - Suspect agglutination
  - Platelet clumping
  - Large atypical cells

The Morphology

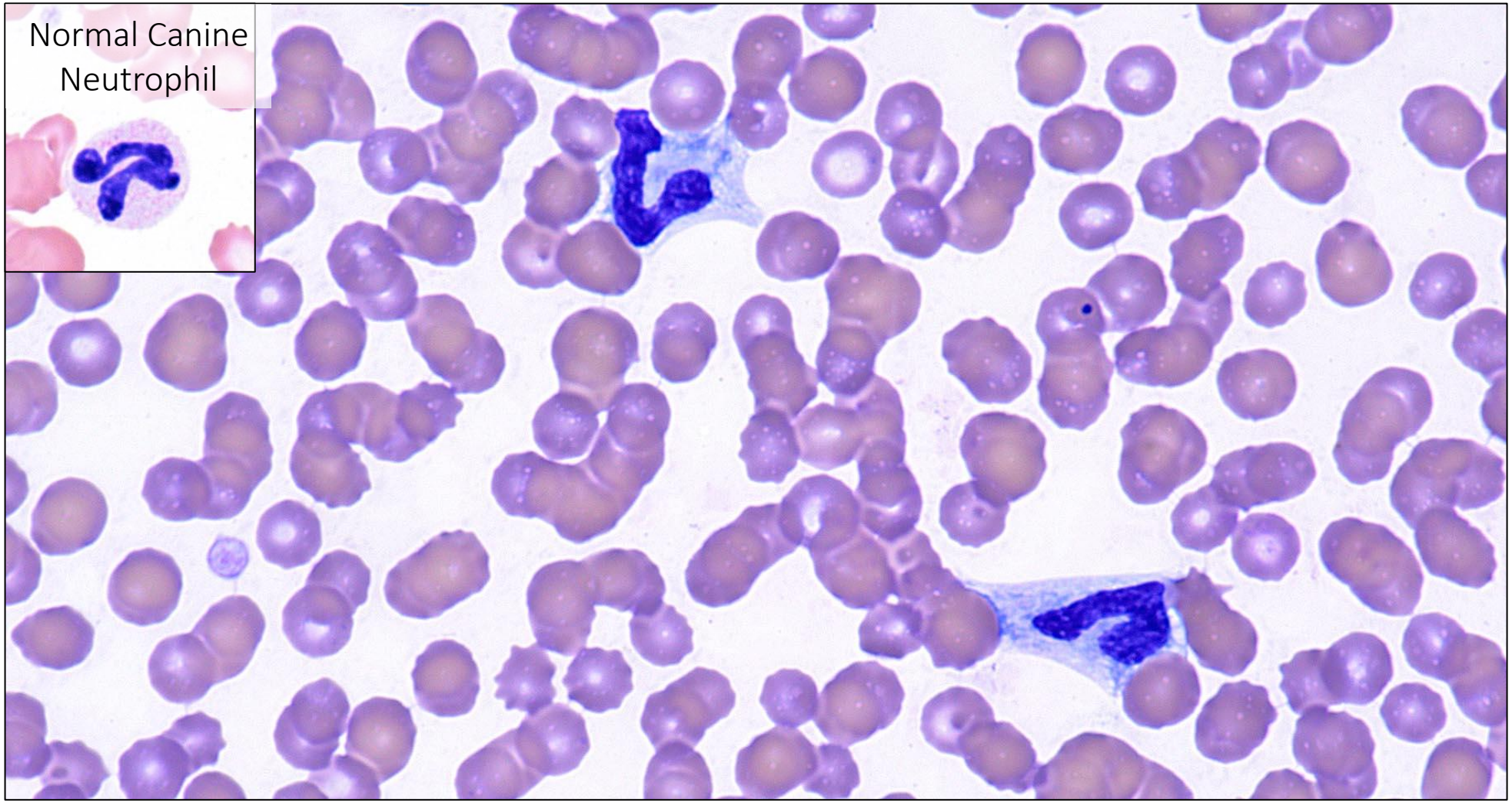


- Monolayer
  - Cell morphology
    - Red blood cells
    - White blood cells
    - Platelets
  - Leukocyte distribution
    - Differential

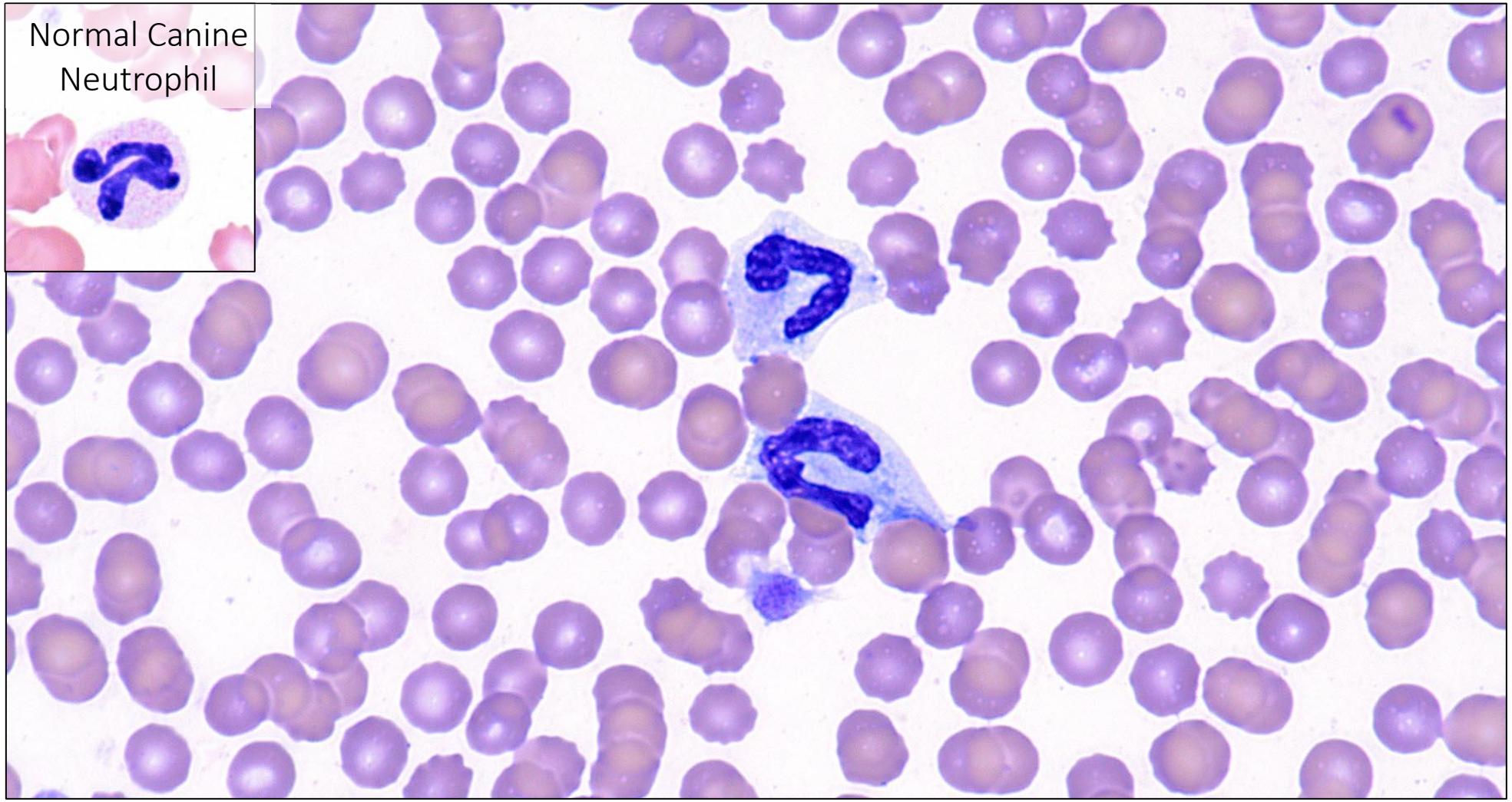
The Morphology



Libby – 12 yr, Fs, Chihuahua mix



Libby – 12 yr, Fs, Chihuahua mix



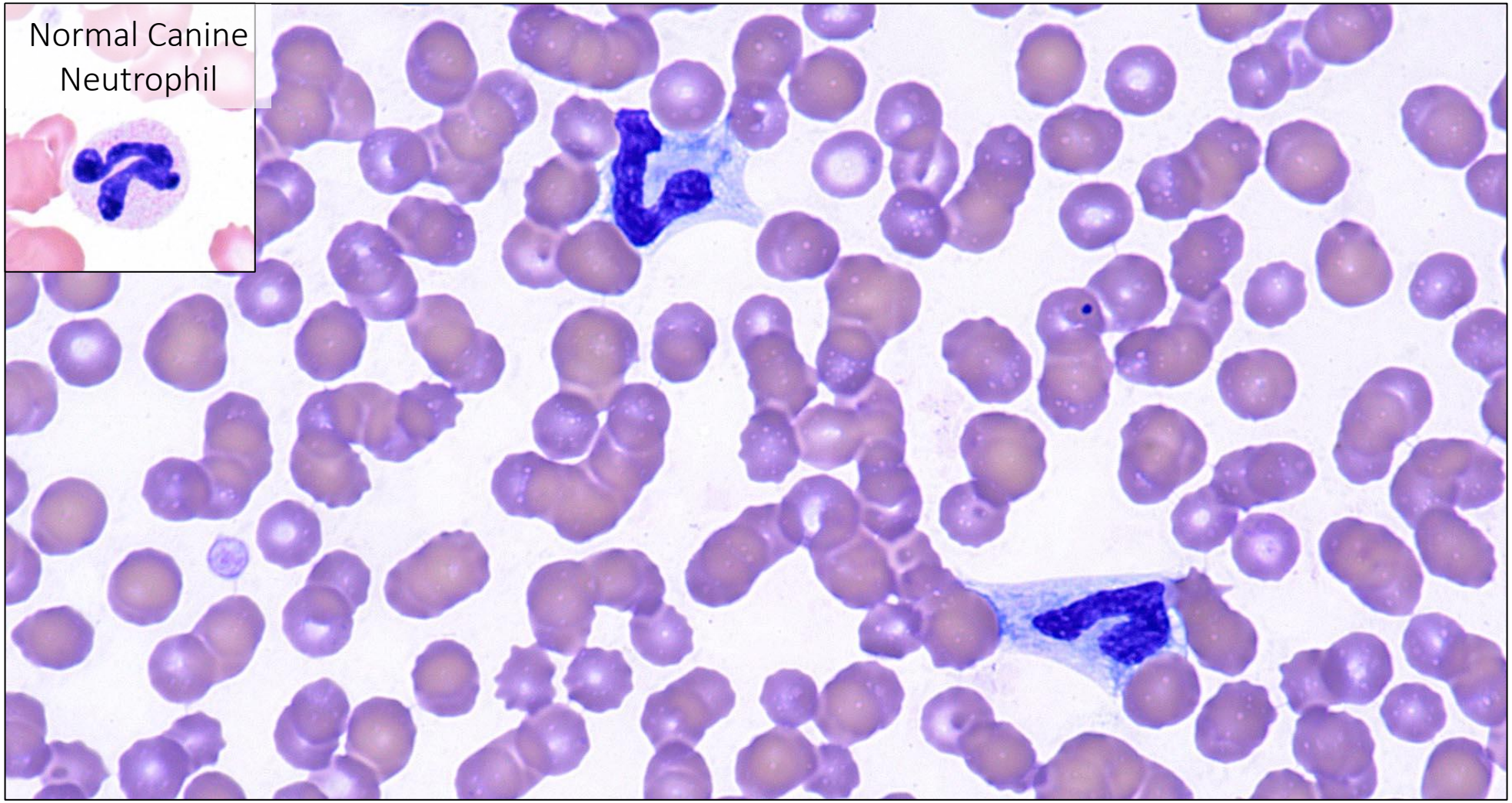
Do not edit
How to change the design

Based on Morphology: What is the best interpretation for Libby's neutrophil changes (Select all correct answers)?

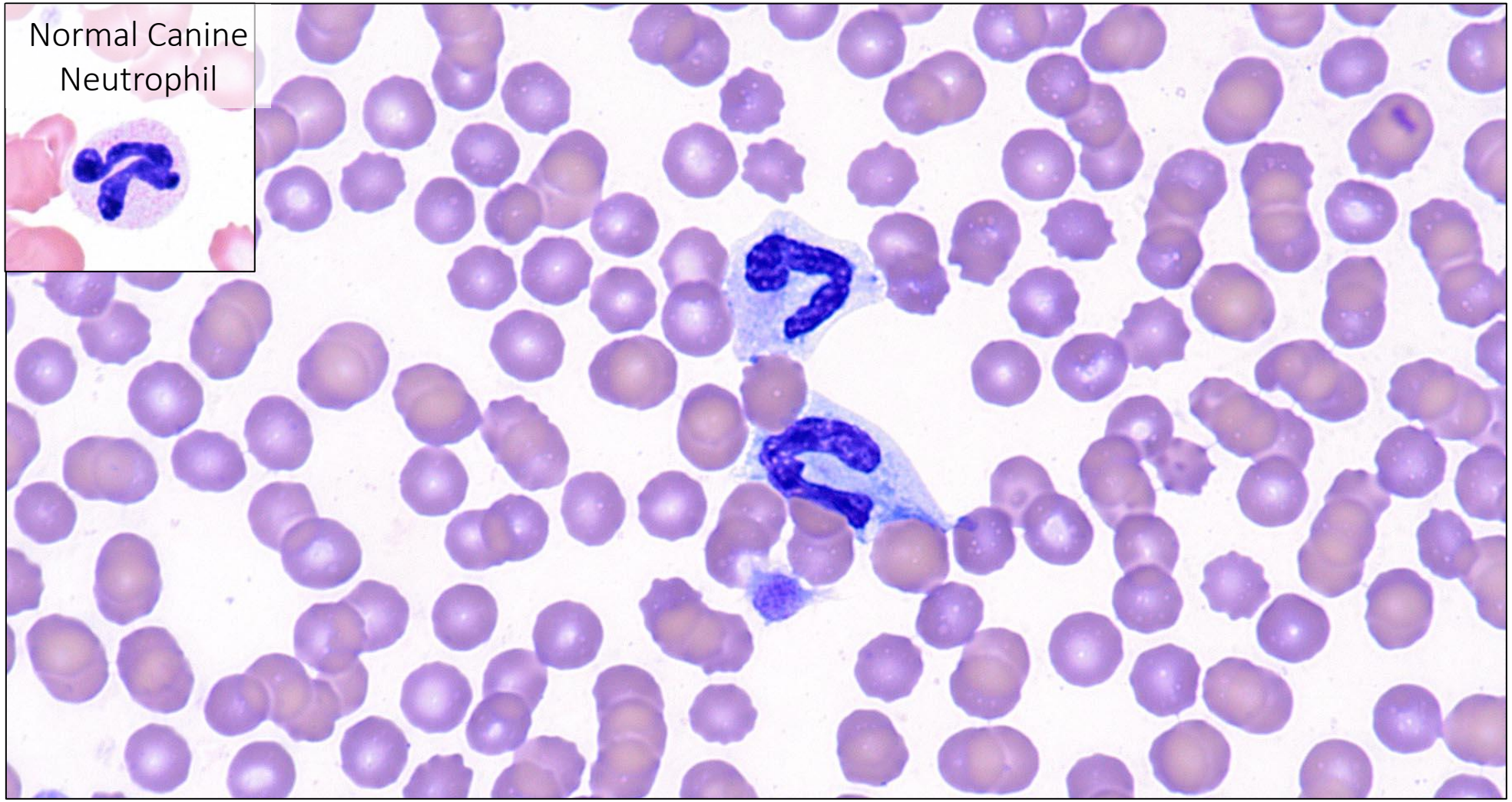
ⓘ The Slido app must be installed on every computer you're presenting from

slido

Libby – 12 yr, Fs, Chihuahua mix



Libby – 12 yr, Fs, Chihuahua mix

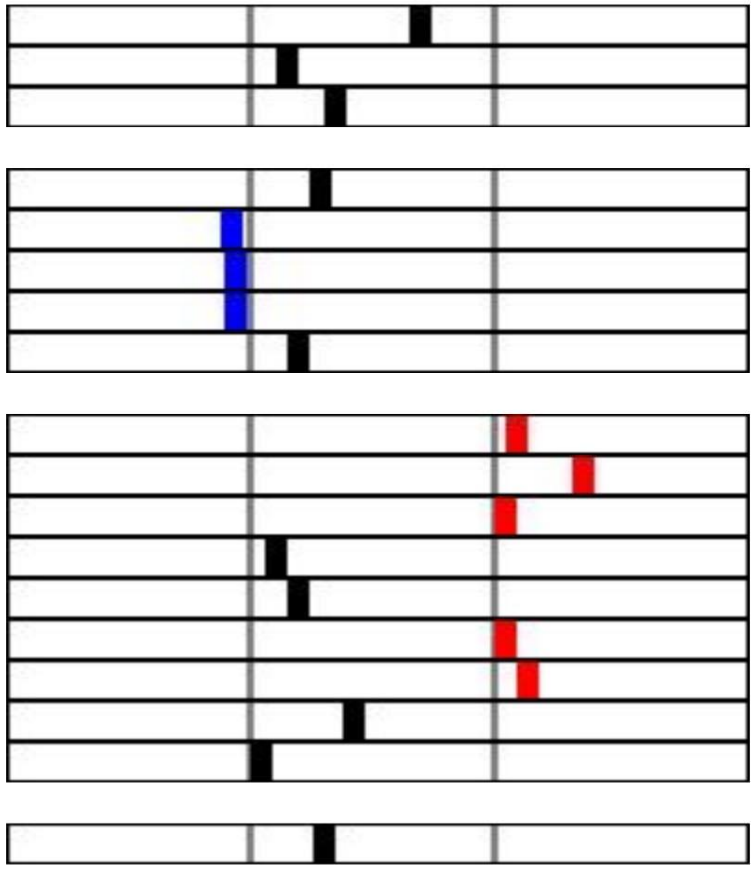


The Chemistry Profile

- Printed copy of chemistry profile and questions given to teams
- After 10-15 minutes the LRs review the profile using PPT

Libby

Test	Results	Reference Interval	
Catalyst Dx (December 7, 2019 6:23 AM)			
GLU	121 mg/dL	70 - 143	
CREA	0.7 mg/dL	0.5 - 1.8	
BUN	14 mg/dL	7 - 27	
BUN/CREA	20		
PHOS	3.8 mg/dL	2.5 - 6.8	
CA	7.5 mg/dL	7.9 - 12.0	LOW
TP	5.0 g/dL	5.2 - 8.2	LOW
ALB	2.1 g/dL	2.2 - 3.9	LOW
GLOB	2.9 g/dL	2.5 - 4.5	
ALB/GLOB	0.7		
ALT	303 U/L	10 - 125	HIGH
ALKP	1965 U/L	23 - 212	HIGH
GGT	33 U/L	0 - 11	HIGH
TBIL	0.1 mg/dL	0.0 - 0.9	
CHOL	154 mg/dL	110 - 320	
AMYL	1958 U/L	500 - 1500	HIGH
LIPA	2898 U/L	200 - 1800	HIGH
Na	151 mmol/L	144 - 160	
K	3.6 mmol/L	3.5 - 5.8	
Na/K	42		
Cl	113 mmol/L	109 - 122	
Osm Calc	299 mmol/kg		



Do not edit
How to change the design

Based on Biochemical Profile: What is the best interpretation for Libby's chemistry profile? (Select all correct interpretations)

ⓘ The Slido app must be installed on every computer you're presenting from

slido

Libby

ALT – hepatocellular injury
ALKP and GGT – cholestasis
ALB, BUN, CHOL, TBIL – liver function

Liver

ALT	303 U/L	10 - 125	HIGH
ALKP	1965 U/L	23 - 212	HIGH
GGT	33 U/L	0 - 11	HIGH
TBIL	0.1 mg/dL	0.0 - 0.9	
CHOL	154 mg/dL	110 - 320	

BUN	14 mg/dL	7 - 27	

TP	5.0 g/dL	5.2 - 8.2	LOW
ALB	2.1 g/dL	2.2 - 3.9	LOW
GLOB	2.9 g/dL	2.5 - 4.5	
ALB/GLOB	0.7		

Libby

Pancreas

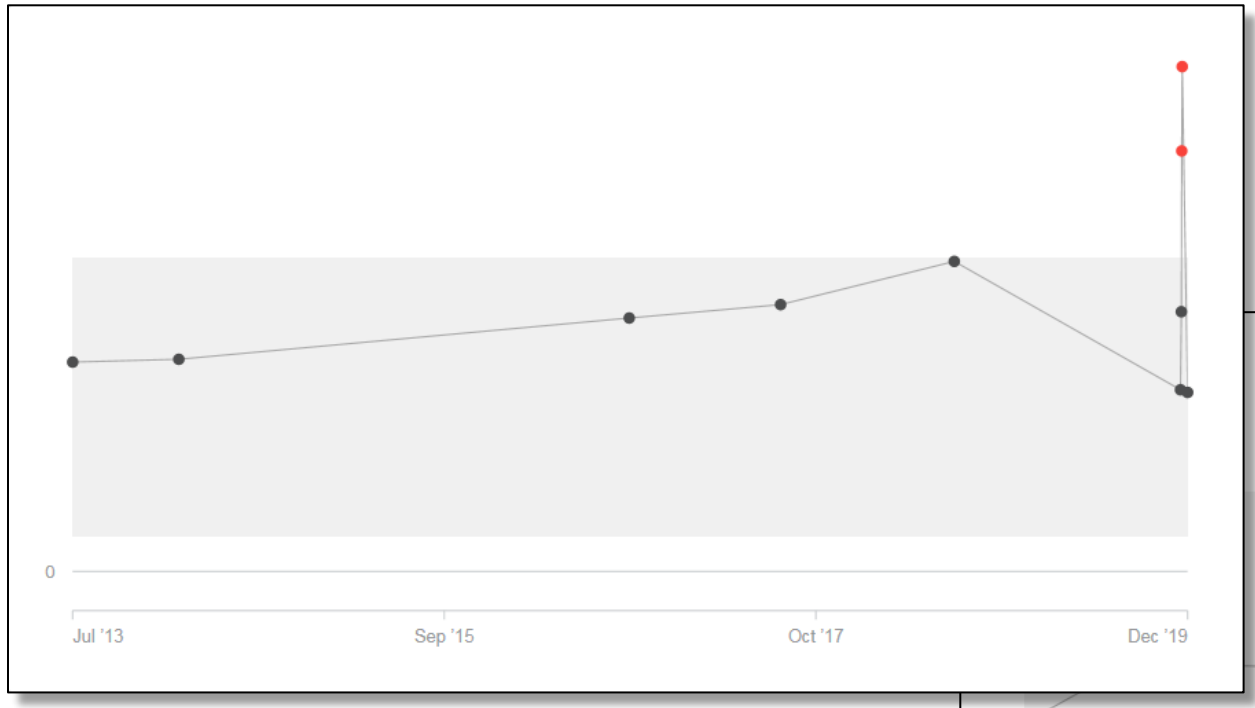
Mild nonspecific increases in Amylase and Lipase ???

Test	Results	Reference Interval	LOW	NORMAL	HIGH
Catalyst Dx (December 7, 2019 6:23 AM)					
GLU	121 mg/dL	70 - 143			
CREA	0.7 mg/dL	0.5 - 1.8			
BUN	14 mg/dL	7 - 27			
BUN/CREA	20				
PHOS	3.8 mg/dL	2.5 - 6.8			
CA	[illegible]	[illegible]	LOW		
AMYL	1958 U/L	500 - 1500	HIGH		
LIPA	2898 U/L	200 - 1800	HIGH		
ALB/GLOB	0.7				
ALT	303 U/L	10 - 125	HIGH		
ALKP	1965 U/L	23 - 212	HIGH		
GGT	33 U/L	0 - 11	HIGH		
TBIL	0.1 mg/dL	0.0 - 0.9			
CHOL	154 mg/dL	110 - 320			
AMYL	1958 U/L	500 - 1500	HIGH		
LIPA	2898 U/L	200 - 1800	HIGH		
Na	151 mmol/L	144 - 160			
K	3.6 mmol/L	3.5 - 5.8			
Na/K	42				
Cl	113 mmol/L	109 - 122			
Osm Calc	299 mmol/kg				
CRP	4.8 mg/dL	0.0 - 1.0	HIGH		

C-Reactive Protein (CRP)
CRP concentrations >3.0 mg/dL indicate clinically significant systemic inflammation.

Libby – 12 yr, Fs, Chihuahua mix

Lipase



Amylase

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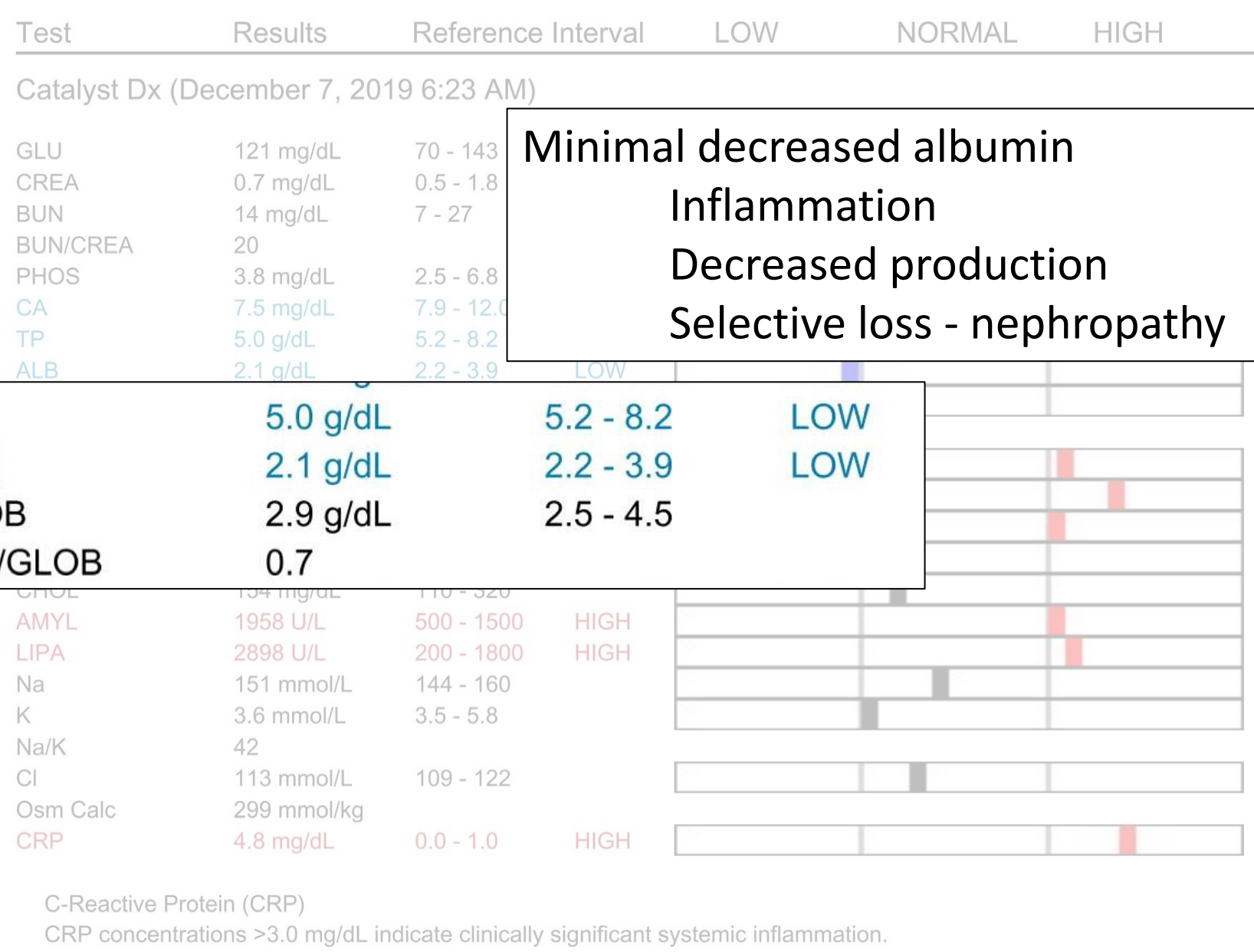
Libby

Proteins

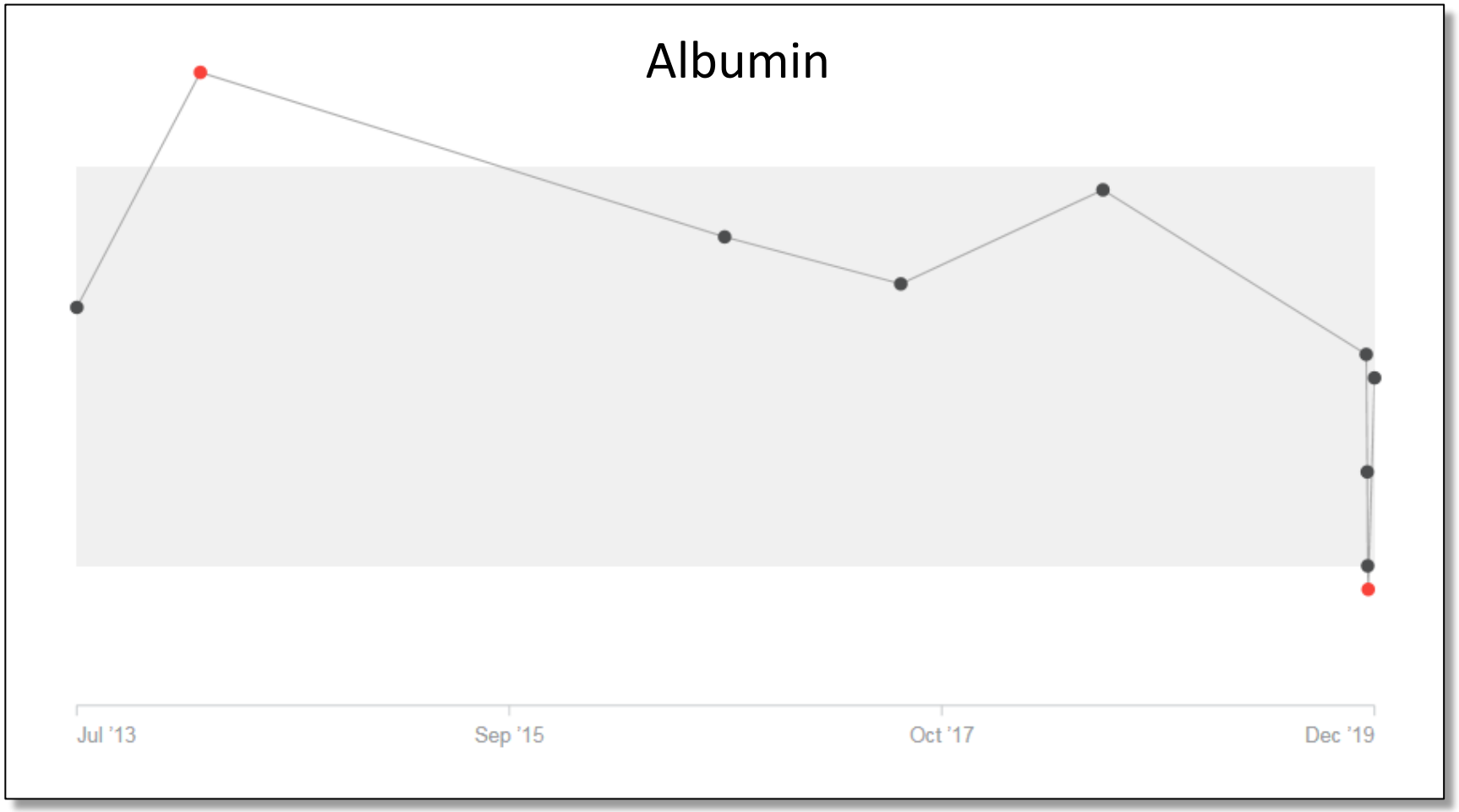
Test	Results	Reference Interval	
TP	5.0 g/dL	5.2 - 8.2	LOW
ALB	2.1 g/dL	2.2 - 3.9	LOW
GLOB	2.9 g/dL	2.5 - 4.5	
ALB/GLOB	0.7		

Minimal decreased albumin

- Inflammation
- Decreased production
- Selective loss - nephropathy



Libby – 12 yr, Fs, Chihuahua mix



Libby

Kidney

Test	Results	Reference Interval	LOW / NORMAL / HIGH
Catalyst Dx (December 7, 2019 6:23 AM)			
GLU	121 mg/dL	70 - 143	
CREA	0.7 mg/dL	0.5 - 1.8	
BUN	14 mg/dL	7 - 27	
BUN/CREA	20		
PHOS	3.8 mg/dL	2.5 - 6.8	
CA	7.5 mg/dL	7.9 - 12.0	LOW
TP	5.0 g/dL	5.2 - 8.2	LOW
ALB	2.1 g/dL	2.2 - 3.9	LOW
TBIL	0.1 mg/dL	0.0 - 0.9	
CHOL	154 mg/dL	110 - 320	
AMYL	1958 U/L	500 - 1500	HIGH
LIPA	2898 U/L	200 - 1800	HIGH
Na	151 mmol/L	144 - 160	
K	3.6 mmol/L	3.5 - 5.8	
Na/K	42		
Cl	113 mmol/L	109 - 122	
Osm Calc	299 mmol/kg		
CRP	4.8 mg/dL	0.0 - 1.0	HIGH

C-Reactive Protein (CRP)
CRP concentrations >3.0 mg/dL indicate clinically significant systemic inflammation.

What's missing

Urinalysis – urine specific gravity

IDEXX SDMA

CREA	0.7 mg/dL	0.5 - 1.8
BUN	14 mg/dL	7 - 27
BUN/CREA	20	

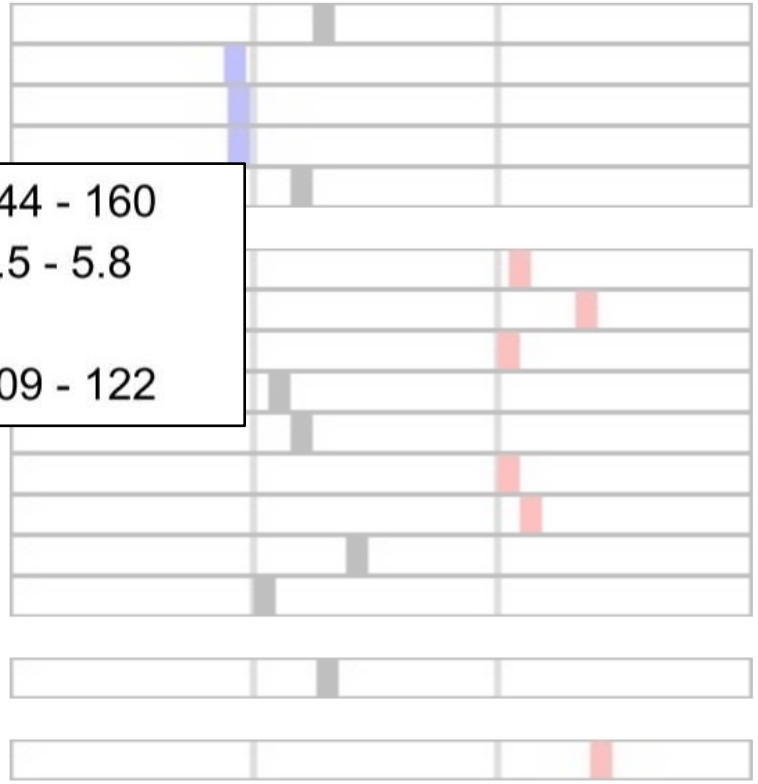
Libby

Electrolytes

No significant electrolyte changes
No obvious acid-base abnormalities

Test	Results	Reference Interval	LOW / NORMAL / HIGH
Catalyst Dx (December 7, 2019 6:23 AM)			
GLU	121 mg/dL	70 - 143	
CREA	0.7 mg/dL	0.5 - 1.8	
BUN	14 mg/dL	7 - 27	
BUN/CREA	20		
PHOS	3.8 mg/dL	2.5 - 6.8	
CA	7.5 mg/dL	7.9 - 12.0	LOW
TP	5.0 g/dL	5.2 - 8.2	LOW
ALB	2.1 g/dL	2.2 - 3.9	LOW
Na	151 mmol/L	144 - 160	
K	3.6 mmol/L	3.5 - 5.8	
Na/K	42		
Cl	113 mmol/L	109 - 122	
CHOL	154 mg/dL	110 - 320	
AMYL	1958 U/L	500 - 1500	HIGH
LIPA	2898 U/L	200 - 1800	HIGH
Na	151 mmol/L	144 - 160	
K	3.6 mmol/L	3.5 - 5.8	
Na/K	42		
Cl	113 mmol/L	109 - 122	
Osm Calc	299 mmol/kg		
CRP	4.8 mg/dL	0.0 - 1.0	HIGH

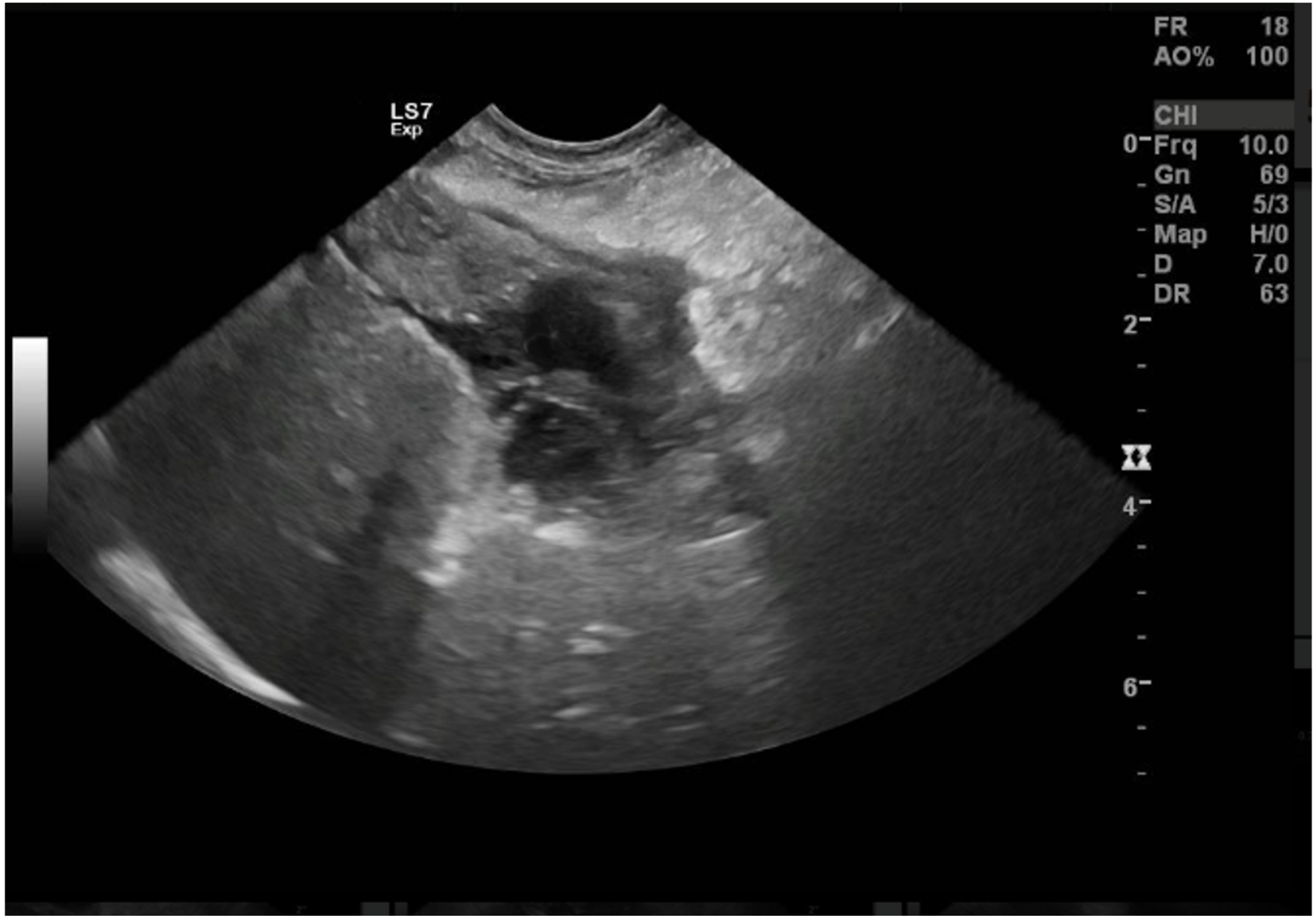
C-Reactive Protein (CRP)
CRP concentrations >3.0 mg/dL indicate clinically significant systemic inflammation.



Will your team win the Gold?

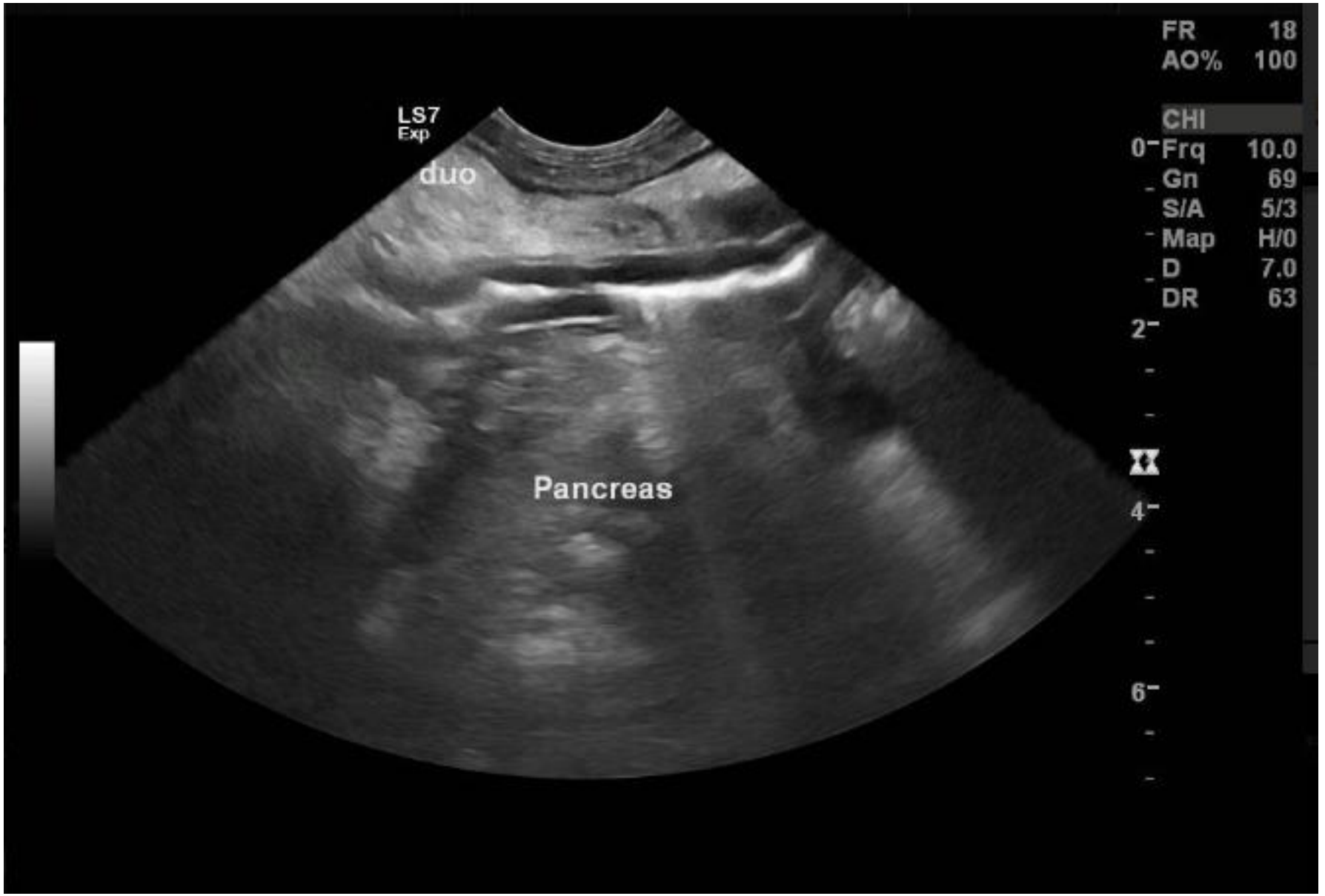
- We will show the ultrasound images and the cytology of the abdominal fluid.
- Printed copy of fluid analysis given to teams
- After 10 minutes the LRs review the fluid cytology using PPT and award the medals based on the team's final presentation and reasons for their diagnosis.
- Finally, we show the intraoperative photos to show the ruptured gall bladder from gall bladder mucocele.

Liver
LS7
Exp
FR 18
AO% 100
CHI
Frq 10.0
Gn 69
S/A 5/3
Map H/0
D 5.0
DR 63
0
2
4



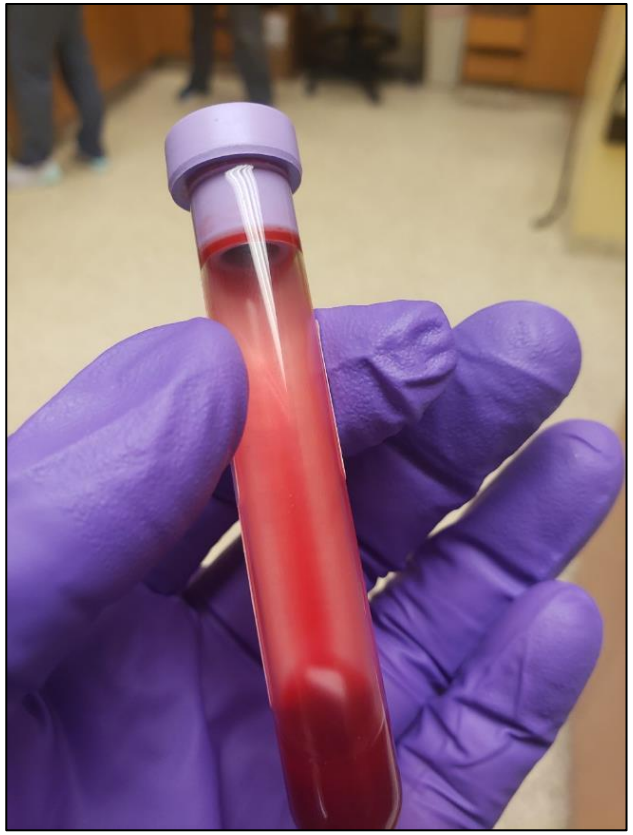
Laboratory Retrievers

Animals can’t hide their objective data


LS7
Exp
duo
Pancreas
FR 18
AO% 100
CHI
Frq 10.0
Gn 69
S/A 5/3
Map H/0
D 7.0
DR 63
0
2
4
6

LS7
Exp
asc
FR 18
AO% 100
CHI
Frq 10.0
Gn 69
S/A 5/3
Map H/0
D 5.0
DR 63
0
2
4

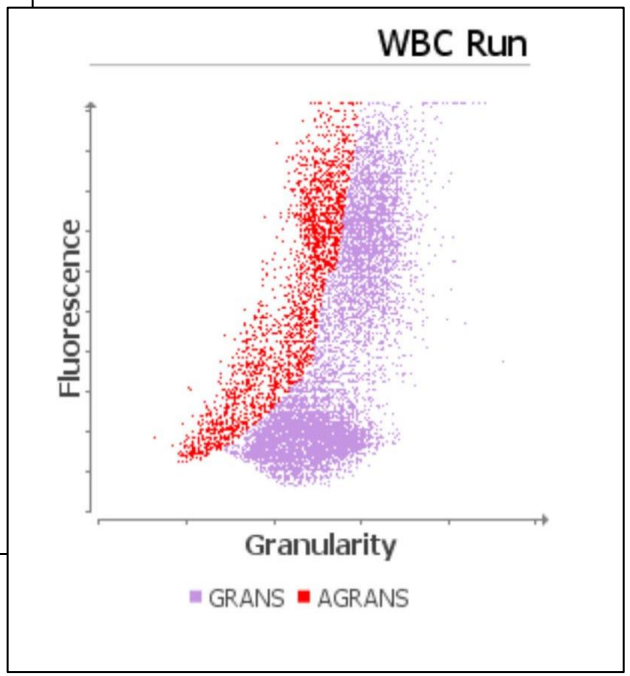
Libby – 12 yr, Fs, Chihuahua mix



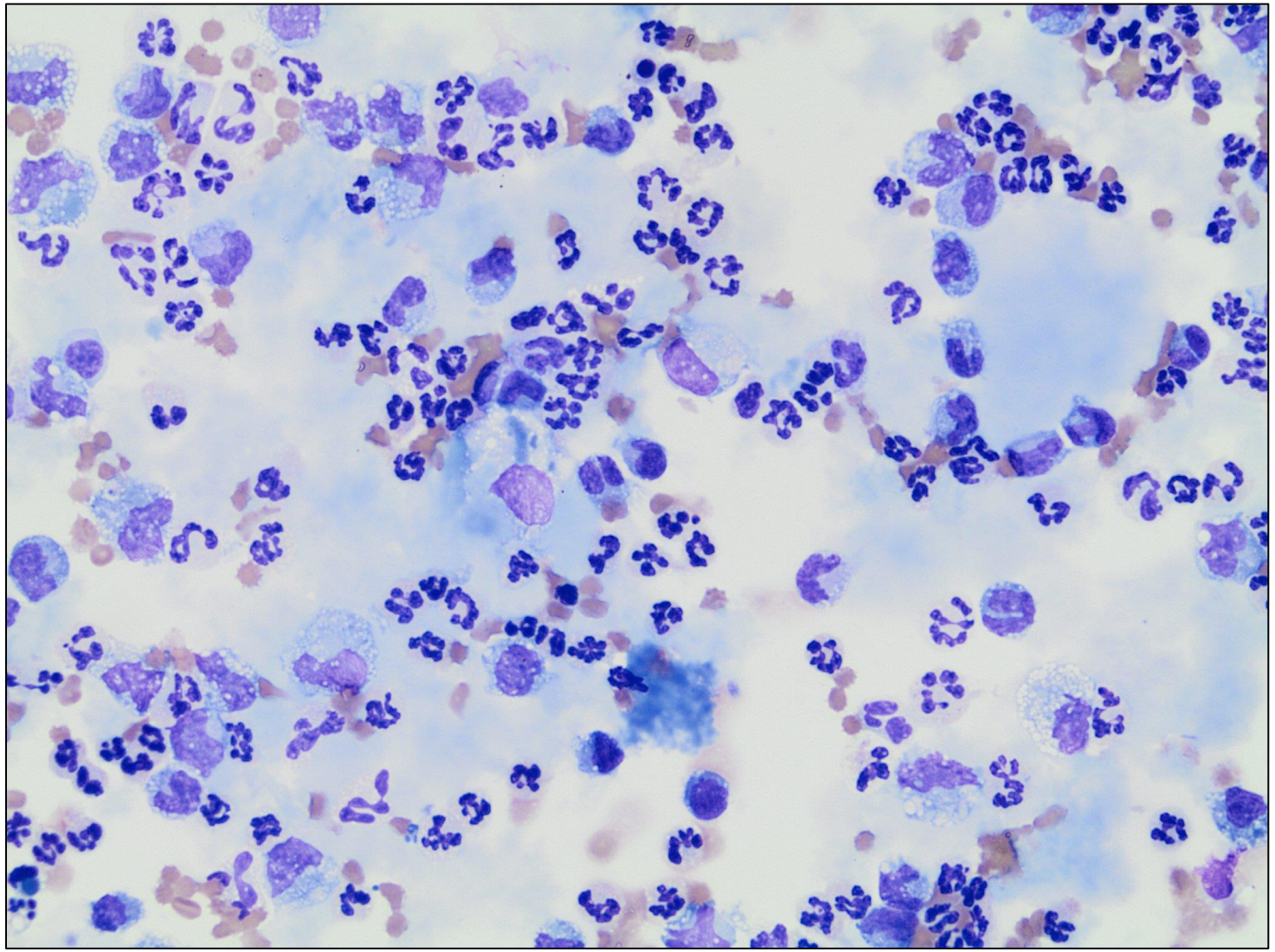
Test	Results
ProCyte Dx (December 5, 2019 12:45 PM)	
RBC	0.10 M/µL
TNCC	43.84 K/µL
%GRANS	91.1 %
%AGRANS	8.9 %
GRANS	39.93 K/µL
AGRANS	3.91 K/µL

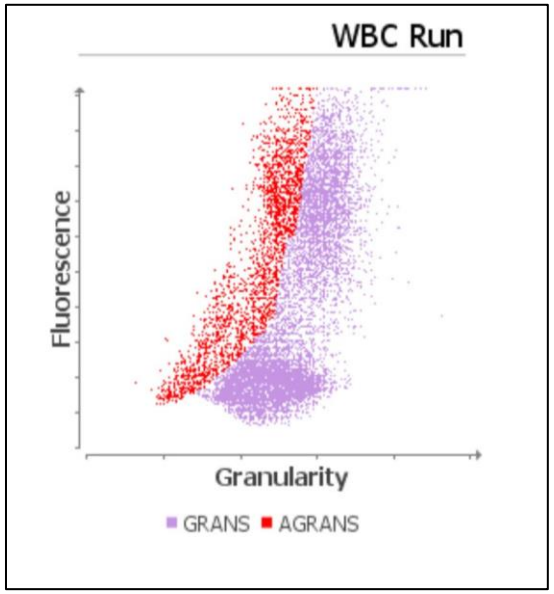
WBC Abnormal Distribution

Sample type: Abdominal



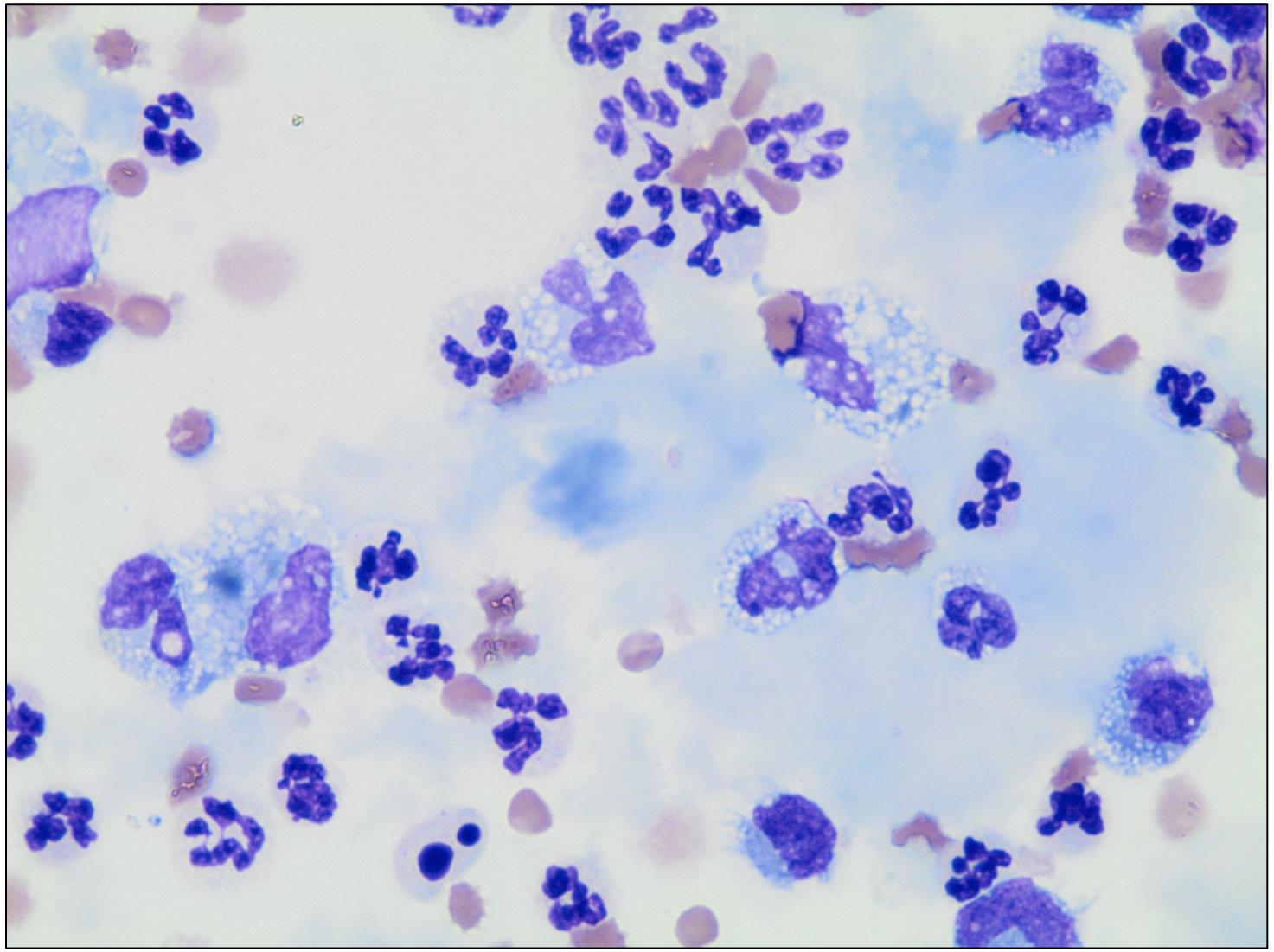
Libby – 12 yr, Fs, Chihuahua mix

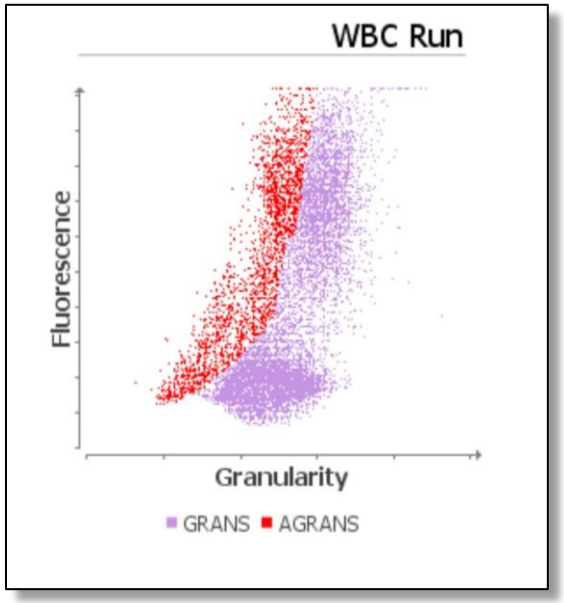




Laboratory Retrievers
Animals can't hide their objective data

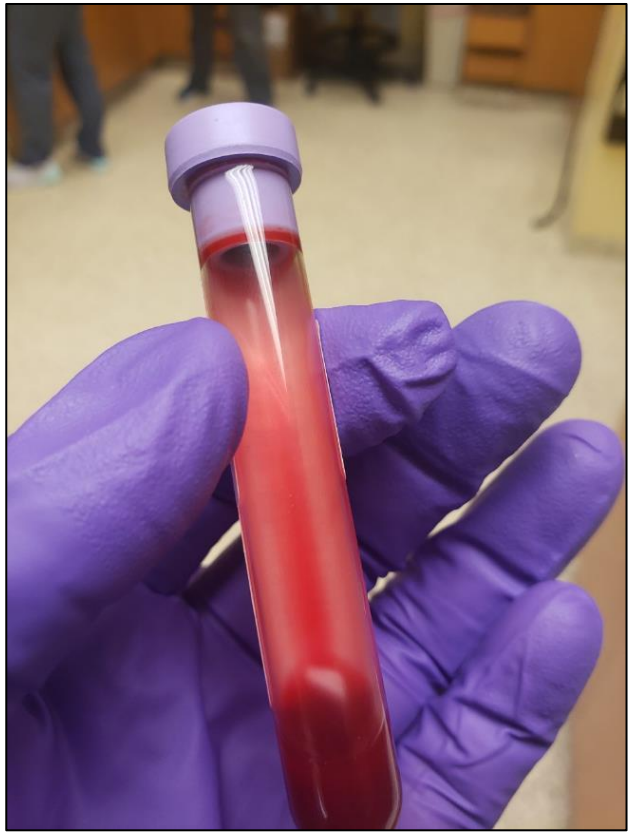
Libby – 12 yr, Fs, Chihuahua mix





Laboratory Retrievers
Animals can't hide their objective data

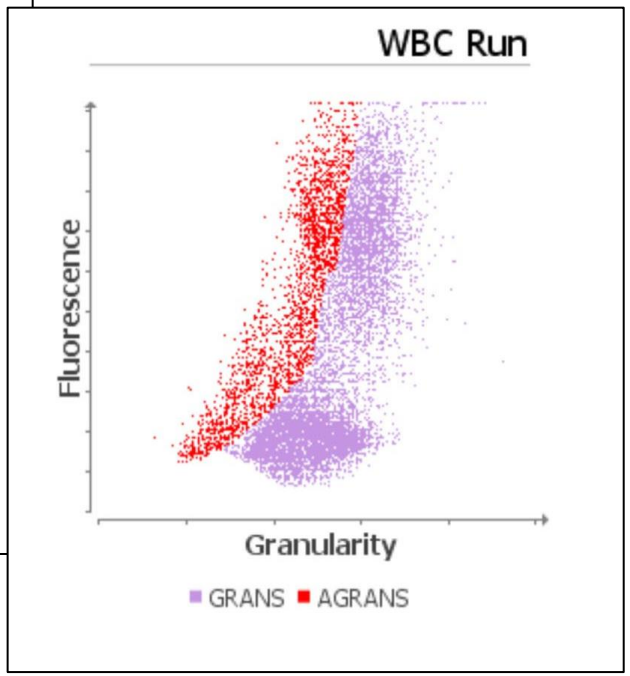
Libby – 12 yr, Fs, Chihuahua mix



Test	Results
ProCyte Dx (December 5, 2019 12:45 PM)	
RBC	0.10 M/µL
TNCC	43.84 K/µL
%GRANS	91.1 %
%AGRANS	8.9 %
GRANS	39.93 K/µL
AGRANS	3.91 K/µL

WBC Abnormal Distribution

Sample type: Abdominal



Catalyst Dx (December 5, 2019 1:12 PM)

TBIL	1.0 mg/dL	0.0 - 0.9	HIGH

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Do not edit
How to change the design

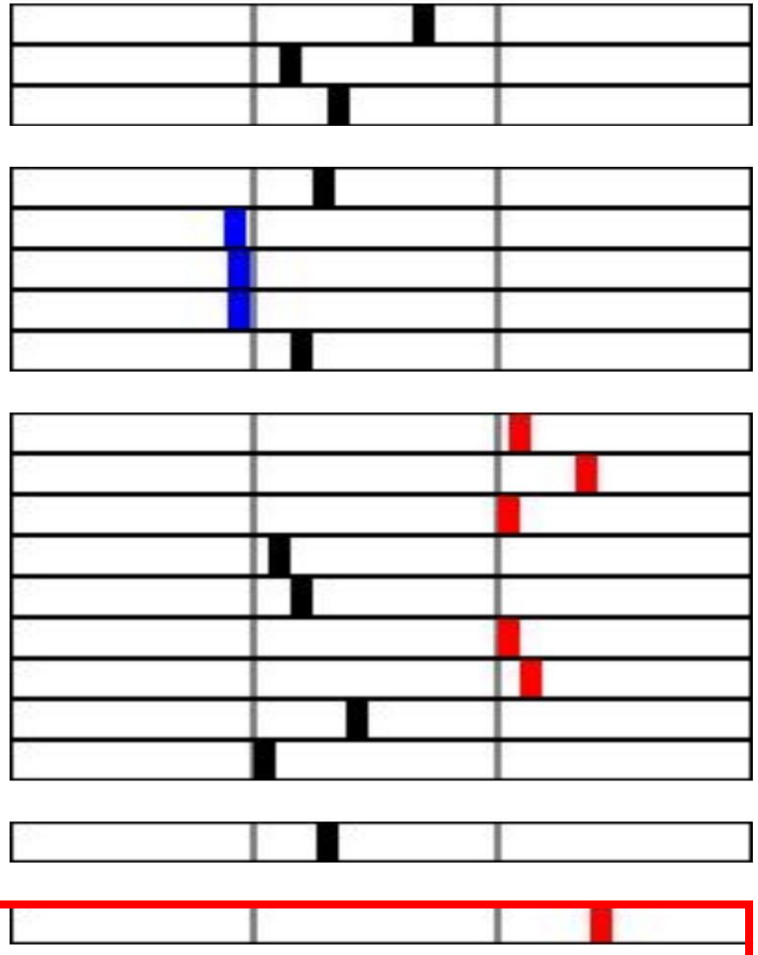
What’s your diagnosis (select all correct answers)?

ⓘ The Slido app must be installed on every computer you’re presenting from

slido

Libby

Test	Results	Reference Interval	LOW / NORMAL / HIGH
Catalyst Dx (December 7, 2019 6:23 AM)			
GLU	121 mg/dL	70 - 143	
CREA	0.7 mg/dL	0.5 - 1.8	
BUN	14 mg/dL	7 - 27	
BUN/CREA	20		
PHOS	3.8 mg/dL	2.5 - 6.8	
CA	7.5 mg/dL	7.9 - 12.0	LOW
TP	5.0 g/dL	5.2 - 8.2	LOW
ALB	2.1 g/dL	2.2 - 3.9	LOW
GLOB	2.9 g/dL	2.5 - 4.5	
ALB/GLOB	0.7		
ALT	303 U/L	10 - 125	HIGH
ALKP	1965 U/L	23 - 212	HIGH
GGT	33 U/L	0 - 11	HIGH
TBIL	0.1 mg/dL	0.0 - 0.9	
CHOL	154 mg/dL	110 - 320	
AMYL	1958 U/L	500 - 1500	HIGH
LIPA	2898 U/L	200 - 1800	HIGH
Na	151 mmol/L	144 - 160	
K	3.6 mmol/L	3.5 - 5.8	
Na/K	42		
Cl	113 mmol/L	109 - 122	
Osm Calc	299 mmol/kg		
CRP	4.8 mg/dL	0.0 - 1.0	HIGH



C-Reactive Protein (CRP)
CRP concentrations >3.0 mg/dL indicate clinically significant systemic inflammation.

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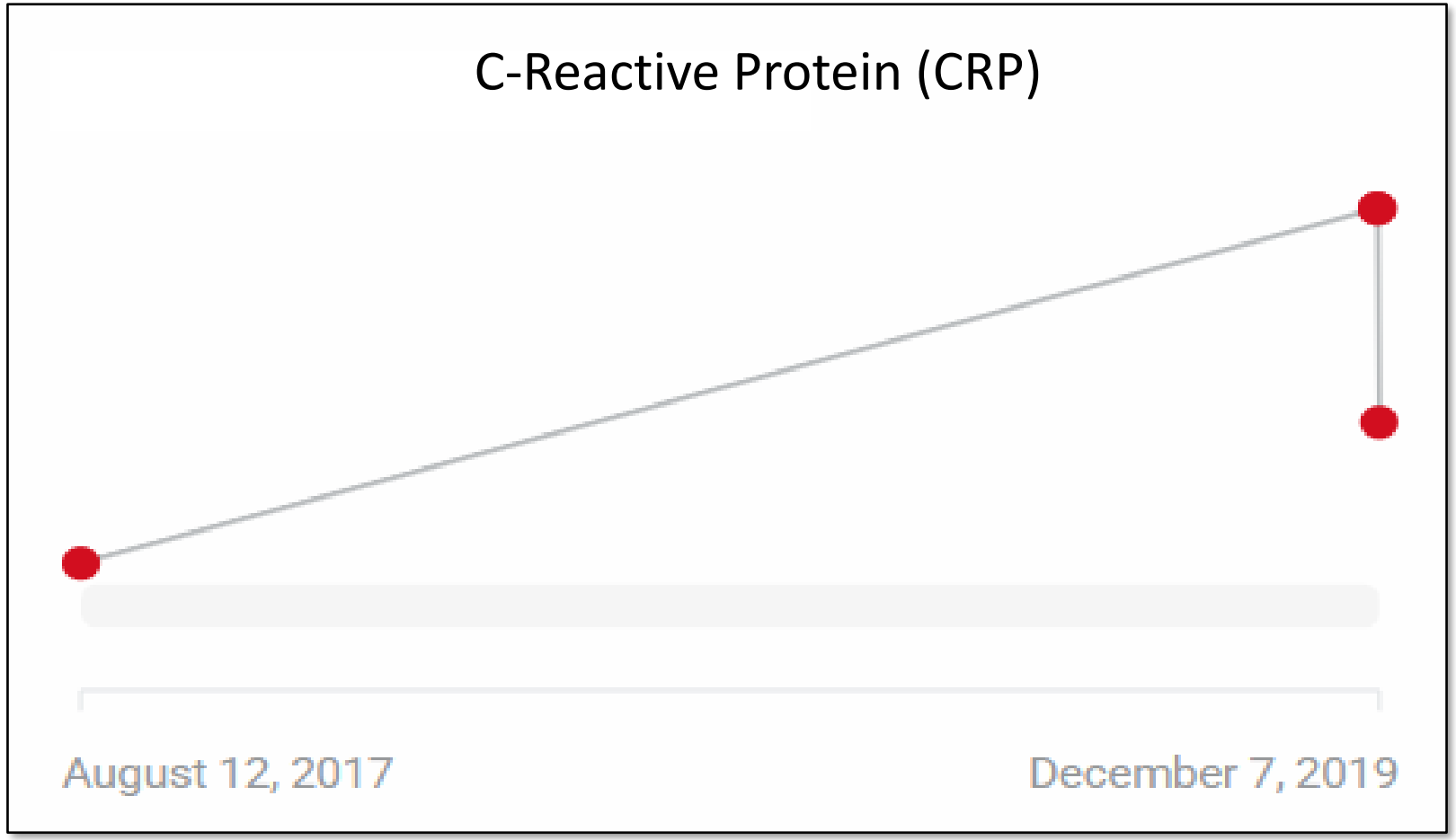

Laboratory Retrievers
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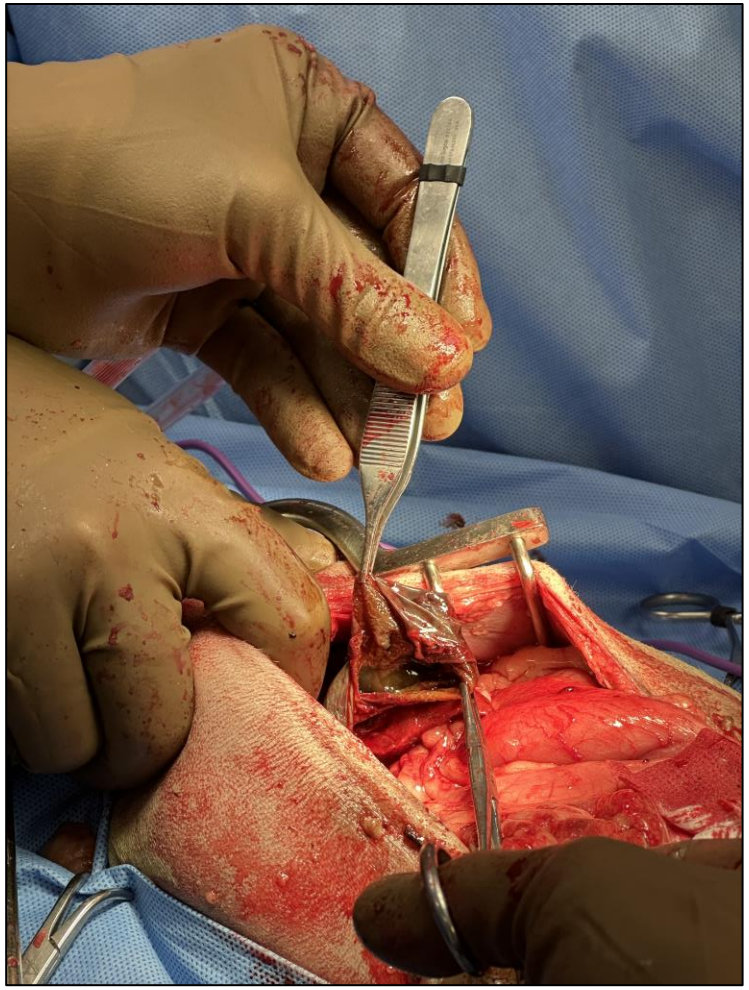
Libby –ruptured gall bladder mucocele



Join Purdue and the Laboratory Retriever Team!

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Dr. Fred Metzger, DVM, MRCVS, DABVP

Laboratory Retrievers

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