

## What are dot plots?

Dot plots are a visual representation of the complete blood count (CBC); each dot represents a single cell. Dot plots are a critical element of the CBC, providing a snapshot of cellular morphology. This document will help you identify various feline and canine disease states.

## What are the disease states?

### Reticulocytosis

Reticulocytosis (an increased number of reticulocytes) is the hallmark and most objective indicator of a regenerative anemia. Reticulocytosis without anemia may also be an indicator of resolving anemia or other occult disease processes. Reticulocytes are easily identified as the magenta dots to the right of the mature red blood cell population (red dots). The new methylene blue dye binds to the residual reticulum, capturing the reticulocytes' increased complexity compared to the normal mature red blood cells. In a normal dot plot, there are few reticulocytes and their density is much less than shown in an abnormal dot plot. Rapid review of the dot plot allows for a quick validation of the reticulocyte count.

### Thrombocytopenia

Thrombocytopenia can be a critical finding in a complete blood count (CBC), so rapid validation of results from the hematology analyzer is essential. In red blood cell and platelet dot plots, severe thrombocytopenia is easily validated. In normal patient dot plots, there are dense accumulations of blue dots representing individual platelet optical profiles. During severe thrombocytopenia, the density of the blue dots is dramatically reduced. Blood film microscopic review for possible platelet clumping is recommended for any case with a reported low platelet count. Clumped platelets may cause a false low platelet count, resulting in platelet events not appearing on these dot plots.

### Platelet clumping

Platelet clumping is a common problem in veterinary medicine, especially with feline samples. Any time a difficult sample collection results in a delay in filling the EDTA tube or delay in proper mixing, there is a potential for platelet clumping. There are different degrees of platelet clumping, and most advanced analyzers recognize large platelet clumps. When platelet clumps are identified and the platelet count is below the reference interval, you'll receive a message alerting you to the presence of platelet clumps. A rapid review of the dot plots provides you with a very quick validation if large platelet clumps are present. Large platelet clumps are recognized as a light blue cluster of digitized events at the bottom of a white blood cell (WBC) dot plot. A rapid blood film review can also allow for quick recognition of large platelet clumps and verification of results reported. If platelet clumps are reported or observed on a blood film, collection of a new sample for analysis is recommended.

### Leukopenia/neutropenia

Leukopenia (decreased total leukocyte numbers) and, in particular, neutropenia (decreased neutrophil numbers) often have high clinical significance related to overwhelming inflammatory disease and possible effects of chemotherapy; immediate knowledge of these situations is critical to the veterinarian. Marked decreases in leukocytes can be rapidly validated by examining dot plots. When an isolated cell type such as the neutrophil is significantly decreased, it is easily recognized because of the obvious lack of or a dramatic decrease in density of the dot plot cloud associated with that particular leukocyte. In each of the cases shown in this document, there is a leukopenia characterized by a marked neutropenia (note the absence of the cloud of lavender dots representing individual neutrophils in the sample).

### Lymphoid leukemia

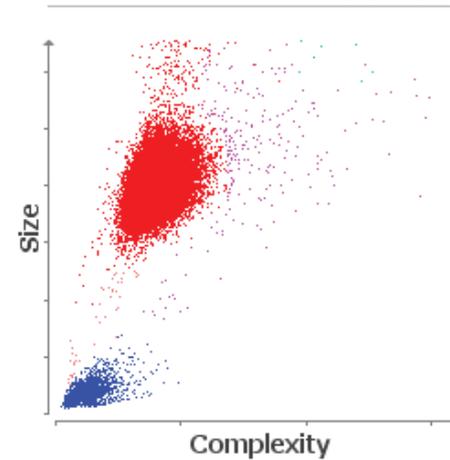
Leukemia has multiple presentations—one of the most common is lymphoid leukemia, either as a result of progression of malignant lymphoma or primary lymphoid leukemia originating in the bone marrow. Most advanced hematology analyzers cannot accurately characterize these circulating malignant cells and have difficulty in differentiating the various types of leukocytes. In normal WBC dot plots, there are distinctly identified clouds of different colored dots representing the various populations of leukocytes typically seen in the peripheral blood; however in the dot plots of lymphoid leukemia patients, clear distinction between the different leukocyte clouds is not present. In ProCyte One\* Hematology analyzer dot plots, there is often extension of the lymphocyte and monocyte clouds vertically on the y axis and an unclear distinction between cell populations.

For more information about ProCyte One dot plots, contact IDEXX Customer and Technical Support or visit [learn.idexx.com](https://learn.idexx.com).

Gender: Male/Castrated  
 Weight:  
 Age: 9 Years  
 Doctor:

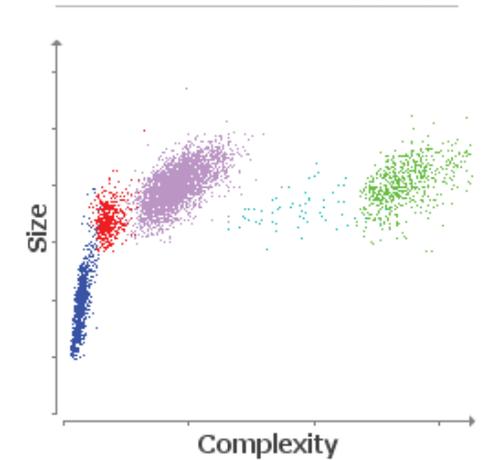
	Results	Reference Interval	LOW	NORMAL	HIGH
ProCyte One (July 19, 2021 7:57 AM)					
PCV	6.93 M/ $\mu$ L	5.65 - 8.87			
CT	46.3 %	37.3 - 61.7			
HGB	16.2 g/dL	13.1 - 20.5			
MCV	66.8 fL	61.6 - 73.5			
MCH	23.4 pg	21.2 - 25.9			
MCHC	35.0 g/dL	32.0 - 37.9			
RDW	16.7 %	13.6 - 21.7			
%RETIC	0.2 %				
RETIC	16.5 K/ $\mu$ L	10.0 - 110.0			
%NEU	66.1 %				
%LYM	22.4 %				
%MONO	4.8 %				
%EOS	6.1 %				
%BASO	0.6 %				
NEU	8.11 K/ $\mu$ L	2.95 - 11.64			
LYM	2.75 K/ $\mu$ L	1.05 - 5.10			
MONO	0.58 K/ $\mu$ L	0.16 - 1.12			
EOS	0.75 K/ $\mu$ L	0.06 - 1.23			
BASO	0.07 K/ $\mu$ L	0.00 - 0.10			
PLT	192 K/ $\mu$ L	148 - 484			
MPV	12.4 fL	8.7 - 13.2			
PDW	13.1 fL	9.1 - 19.4			
PCT	0.24 %	0.14 - 0.46			

RBC Run



■ RBC ■ RETICS ■ PLT ■ RBC Frags ■ WBC

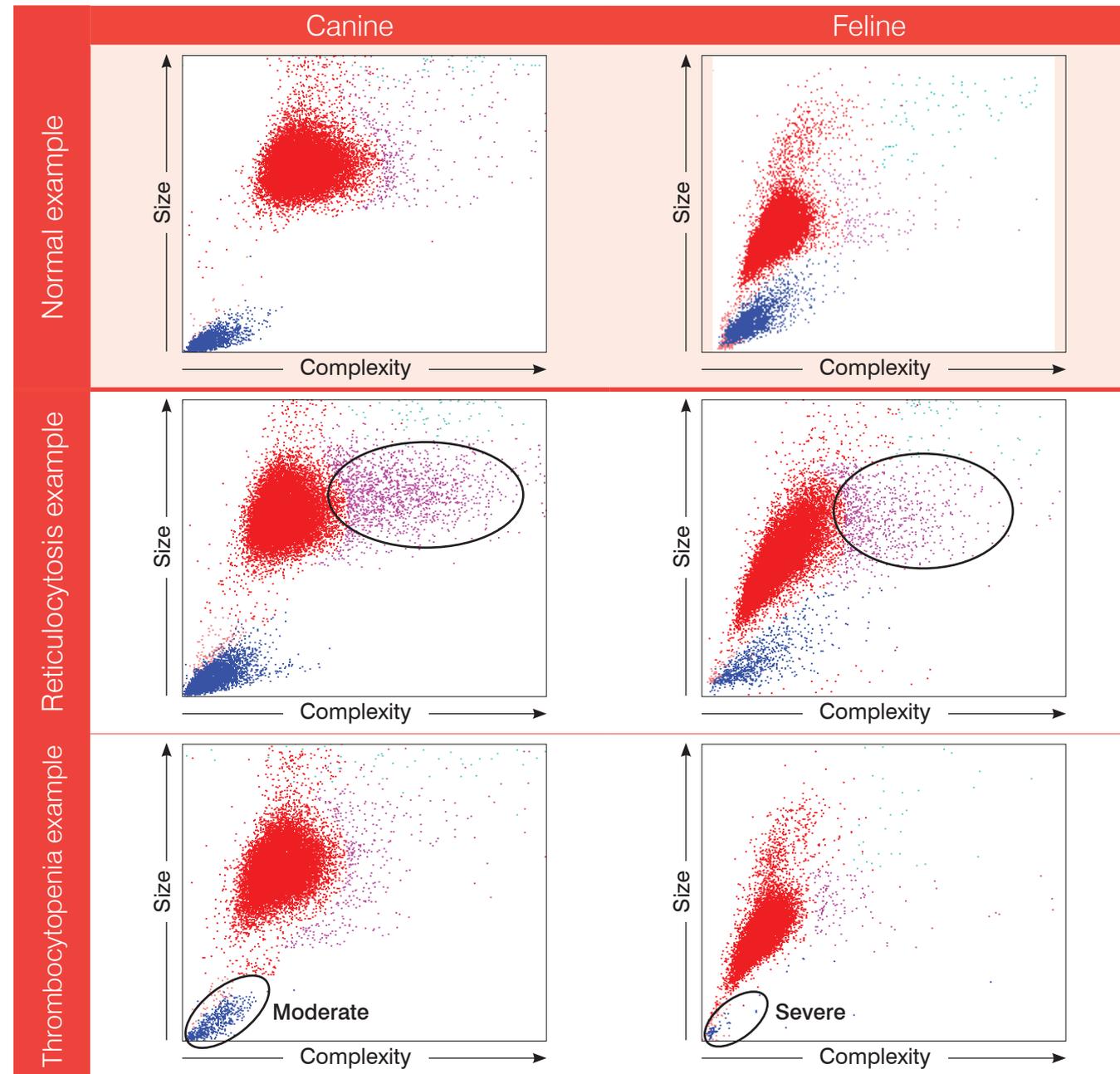
WBC Run



■ NEU ■ LYM ■ MONO ■ EOS ■ BASO



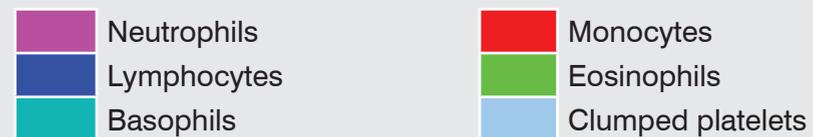
## Red blood cell and platelet dot plots



### Red blood cell dot plot legend



### White blood cell dot plot legend



## White blood cell dot plots

