



## Avian and Reptile Estimated White Blood Cell Count

Automated cell counters are not used for avian and reptile blood samples because the nucleated red cells in these species interfere with accurate white blood cell estimates. Instead, most laboratories process avian and reptile CBCs by counting stained cells on a hemacytometer. An inexpensive and accurate alternative is the leukocyte estimate from blood smears. Avian and reptile white blood cells are evenly distributed across a standard blood smear. A white blood cell count can be obtained by the following technique:

1. **Prepare fresh blood smears.** Blood smears can be made by either the traditional or cover slip method. The ideal slides are made from fresh whole blood; EDTA or heparin may create sample artifacts.
2. **Set the microscope lens at 40X.** Scan for an area in which the cells spread out evenly and are not overlapping.
3. **Begin by counting all leukocytes in the first field.** Small lymphocytes may resemble thrombocytes, but thrombocytes will have a clear area within the cell membrane. If leukocytes extend past the edge of the field, mentally divide the field in half and only count those edge cells on one side of the field. Avoid counting damaged cells. You can also note signs of toxicity, blood parasites, and cell type for a differential count.
4. **Continue to count leukocytes until you have counted 10 fields,** noting the total in each field separately. There should be less than a 10% variation between the fields. With significant variation, you may “drop” outliers from the count, and add another field. If the smear is small or of poor quality, you may count fewer fields, but the count will not be as accurate.
5. **Total up the count from all 10 fields and multiply by 200 to get the total white blood cell count.** If you counted less than 10 fields, use the following formula:

$$\frac{\text{Total slide leukocyte count}}{\text{Number of high power fields}} \times 2000 = \text{Total white blood cells}$$

6. Because this count is based on the relative numbers of white cells and red cells, the count should be corrected in anemic patients by the following formula:

$$\frac{\text{Total WBC Count} \times \text{Actual PCV}}{\text{Normal PCV}} = \text{Corrected WBC}$$

Adapted from: Fudge, Alan M., (ed): Laboratory Medicine Avian and Exotic Pets. Philadelphia, W.B. Saunders, 2000, pp 9-15.