

NEWS FROM THE WORLD OF ONCOLOGY

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THE NADIR CBC

Chemotherapy has many effects on the body. In general, side effects are seen in tissues with rapidly dividing cells. While we are happy to have the cancer cells killed by the treatments, other cell populations are of concern to the health of the patient. The bone marrow is the site where all blood cell lines are produced. When the bone marrow is impacted there can be a decrease in WBC, RBC and platelet counts.

Careful monitoring of the CBC is necessary for all patients receiving chemotherapy. A CBC is checked prior to each chemotherapy treatment to ensure it is safe to administer the treatment. Most attention is paid to the WBC and neutrophil counts. RBC and platelet counts are important but, due to the longer life span of these cells, tend to be less impacted by chemotherapy. For every chemotherapy drug there is a time after treatment when the blood count will be at its lowest point, called the Nadir point. Nadir is the Latin word for trough and the Nadir CBC is the point at which the CBC is at its lowest. Nadir times tend to be 7 or 10 days, though some drugs can have Nadirs as far out as 3 to 5 weeks. It is important to note that GI signs typically occur 3 to 5 days following treatment and usually have resolved by the time the CBC Nadir approaches. Therefore an animal that clinically appears normal may still have low WBC and neutrophil counts.



A key component to chemotherapy is evaluation of the Nadir CBC at the first Nadir. Interpretation of the Nadir CBC depends on many factors. The most important factors are how the patient is doing at home and what the results of the physical examination are. Patients who are clinically ill at the Nadir recheck must be treated regardless of the CBC results. Evaluation of the temperature is important, though it must be remembered that animals with very low WBC counts will not have enough cells present to produce the cytokines necessary to induce fever. Therefore it is possible that an animal with a severely low WBC count will have a normal temperature.

The majority of animals will have WBC counts on the Nadir day ranging from elevated to normal to slightly low. Often, high WBC counts are an "over shoot" response of the bone marrow as it responds, appropriately, to a dropping WBC count. An "over shoot" response does not usually present with a left shift and if a shift is noted then a source of infection should be investigated. In most cases slightly higher than normal WBC counts are not of concern. Normal WBC counts are acceptable. The major question is, "How low is too low?"

In general a neutrophil counts less than 3000 is considered lower than normal. However, most animals will be clinically normal and have a minimal risk of infection if the neutrophil count is 1500 to 3000. There is a heightened level of concern when the count falls below 1500. As the count approaches 1000 this is the point where most animals still will be clinically well but will be at increased risk of infection. These patients are covered with prophylactic antibiotic therapy. In general I use potentiated amoxicillin but TMS would also be considered an appropriate choice. As long as the animals are not clinically ill they can still be managed as out patients. In general the neutrophil count will recover back to normal in 2 to 4 days.

If the neutrophil count drops below 1000 this would be considered a medical emergency. These animals require hospitalization, reverse isolation, IV fluids, broad-spectrum antibiotics and in most cases granulocyte colony stimulating factor (GCSF). GCSF stimulates the bone marrow to produce white blood cells. In most cases only one treatment of this medication is necessary to cause the neutrophil count to begin to rise. GCSF treatments are continued daily until the WBC count starts to increase, at which point treatments can be stopped. GCSF treatments are contraindicated in animals with leukemia. With hospitalization and aggressive therapy, most patients can be released from the hospital in 2 to 3 days. Future chemotherapy treatments are adjusted so as to avoid such low Nadir CBC levels.

Dr. Kevin Finora is a board certified Oncologist and Small Animal Internist. He sees patients Wednesday (including evenings) to Saturday at VEC/RC South. Please do not hesitate to contact Dr. Finora if you have any cancer related questions.

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