Help avoid anesthetic complications—run a complete blood count on *every* preanesthetic patient

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Thanks to increased client awareness and compliance, preanesthetic testing is not only practical and accepted, it is also expected. The results benefit everyone as they decrease client anxiety, improve anesthetic safety, establish baseline data and increase a practice's financial health.

Most practices offer or require a chemistry panel with electrolytes for a preanesthetic screen, but rather than run a complete blood count (CBC), they perform only a packed cell volume (PCV) for a hematology profile. A PCV can help determine if a patient is anemic, but it cannot provide information on whether or not platelets are adequate for surgery or if inflammation or a glucocorticoid influence ("stress") is present. To maximize preanesthetic screening value, a CBC must include an accurate platelet count, a five-part white blood cell differential and an absolute reticulocyte count.

A CBC provides a broad overview of the general health status of a patient and should be performed on all patients undergoing preanesthetic screening since it may detect subclinical or early developing disease that might put the patient at risk during anesthesia. Evaluation for potential red blood cell, white blood cell and platelet abnormalities should be performed prior to anesthesia for several important reasons.

- Anemic patients are more prone to tissue hypoxia, which increases the likelihood of anesthetic complications. If anemia is present, an absolute reticulocyte count is needed to appropriately classify the anemia as either regenerative or nonregenerative; this is the first step in characterizing the anemia and eventually identifying the underlying disease process responsible for the anemia.
- Absolute reticulocyte counts are important even in nonanemic patients. Significant reticulocytosis without anemia may indicate important underlying disease, including hypoxia, compensated hemolysis or occult blood loss and other conditions that stimulate bone marrow release of these erythrocyte precursors.
- Polycythemia most commonly results from dehydration. Dehydration may cause hypotension and result in complications, especially when coupled with blood loss and the vasodilatory effects of many anesthetic agents.
- Leukocytosis may be associated with inflammation or a stress response and may intensify following routine dental or surgical procedures. The five-part white blood cell differential is essential to accurately characterize these responses and to help identify underlying disease.
- Leukopenic and neutropenic patients may potentially indicate serious underlying disease or immunodeficiency and have complications in the postanesthetic period. Again, having a five-part differential is essential to further characterize white blood cell response to disease.
- Thrombocytopenia is the most common bleeding disorder in veterinary medicine, and platelets must be evaluated in every preanesthetic profile because the consequences can be life threatening in surgical or dental procedures.

Studies have shown that a PCV is not adequate when it comes to evaluating a patient's health prior to anesthesia.[1]

Over a five year period, results were evaluated from 963,595 patients (mostly young cats and dogs undergoing elective surgical procedures) that were screened with a CBC, serum chemistry analysis and urinalysis. The results regarding hematologic abnormalities included the following:

- Cats were six times more likely to have a platelet count of less than 50 x $10^3/\mu L$ or a white blood cell count of more than 25,000/μL than a PCV of less than 25%.
- Dogs were four times more likely to have a platelet count of less than 100 x $10^3/\mu L$ or a white blood cell count of more than 20,000/μL than a PCV of less than 35%.

Run same-day, preanesthetic testing in-house

Preanesthetic testing should be performed immediately prior to anesthesia on a fasted patient to properly evaluate a patient's status and adjust anesthetic agents or protocols.

- Client compliance increases when preanesthetic testing occurs in-house, which maximizes client convenience and ensures the patient has been fasted for the best possible results.
- Because red blood cell, white blood cell and platelet abnormalities can occur rapidly in response to a variety of disease processes, such as infectious, inflammatory and metabolic disease, it is essential to perform blood work the same day as the anesthetic event. In addition, many of the hematologic abnormalities can be detected before clinical signs of disease appear, and by including the CBC in the preanesthetic evaluation of a patient, there is improved sensitivity in detecting potential anesthetic complications.
- Hematology samples should be analyzed as soon as possible to prevent artifacts created by exposure to anticoagulants and natural cell deterioration over time; in-house hematology testing provides true real-time care and eliminates most of these potential problems.
- Delayed sample processing by as little as 24–48 hours can result in artifactual changes in the CBC. For example, mean cell volume (MCV) and hematocrit (HCT) may increase with prolonged exposure to anticoagulant. Additionally, when sample collection is difficult, platelet clumping commonly occurs and exaggerated clumping may be seen if hematologic analysis is delayed, resulting in inaccurate platelet counts.

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Reference
1. Lewis HB. Healthy pets benefit from blood work. *Banfield J.* 2006;2(1):18–20

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