



Healthy Pets benefit from blood work



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Performing a comprehensive preanesthetic evaluation is the best way to confirm the health status of a Pet and to determine if it is in the patient's best interest to proceed with anesthesia. This evaluation includes a complete medical history, thorough physical examination and full laboratory assessment.

Using a consistent step-by-step approach to evaluating a Pet before anesthesia allows the practitioner to perform a thorough assessment to detect abnormalities or disease conditions. It also allows a doctor to collect, when possible, baseline laboratory values for the individual healthy Pet. Such findings are valuable if complications arise during or after surgery causing a change in the health status of the Pet, and they are valuable for later comparison if the Pet becomes ill.

The value of baseline data

Clinicians and clinical pathologists who conduct preclinical safety studies in the pharmaceutical industry realize the value of having baseline data on study animals. Repetitive sampling of normal animals reveals a remarkable homeostasis in health. Parameters such as the red blood cell (RBC) count, packed cell volume (PCV), mean corpuscular volume (MCV), hemoglobin

determination, enzyme activities, prothrombin time, electrolyte concentrations and even the white blood cell (WBC) count are essentially stable or constant over time. Indeed, why would they change? Any disturbance in health can often be detected in Pets when parameters change from baseline but remain well within the normal range for the species, age, breed and gender. Trends can be detected (*e.g.*, decreasing PCV or increasing BUN or creatinine) before the test values deviate from the normal values for the population. In other words, when a normal range is established for the individual animal, small changes become important and meaningful.

This approach to health and disease monitoring is known as dynamic laboratory testing and is just as pertinent and useful in Pet patients as it is in experimental animals. It enables a clinician to detect disease early and to monitor response to therapy, aging and environmental changes. A 10 percent change in PCV and a small increase in MCV may well indicate mild or early evidence of RBC loss or destruction and warrant a thorough hematologic evaluation. The collection of blood and urine samples before anesthesia or as part of wellness evaluations is therefore not just for detecting abnormalities but also, and perhaps more importantly,



DataSavant's mission is to:

- Explore the health and well-being of Pet populations
- Evaluate new clinical treatments
- Monitor Pets as sentinels of zoonotic disease in family environments
- Transform Pet medical data into knowledge, *i.e.*, open new windows into Pet health care using the Banfield medical caseload and database.

to confirm the health status and to establish baseline values for subsequent dynamic laboratory testing. To be useful, of course, baseline data must be reviewed each time additional data are generated.

In order to have baseline data on our patients, all Pets on our Wellness Plans are evaluated once or twice annually with a CBC, serum chemistry analysis and urinalysis. All patients are also tested before anesthesia (elective surgeries, dental treatments, nonelective surgeries) and, of course, during diagnostic evaluations when indicated.

We reviewed data for a five-year period during which 992,892 anesthetic procedures were performed. Of these cases, 963,595 (97.1 percent) were screened (CBC, serum chemistry analysis, urinalysis), and 99.9 percent of those screened were found to be healthy and suitable for anesthesia.

Most surgeries were performed on young Pets and overall screening compliance was virtually 100 percent, regardless of the size of the Pet at the time of surgery (Table 1).

The most common elective procedures for dogs and cats were ovariohysterectomy, castration and dental prophylaxis with pre-anesthetic evaluations performed on these Pets (Figure 1). The average age of dogs undergoing ovariohysterectomy was 10 months, 15 days. The average age of cats undergoing ovariohysterectomy was 8 months, 6 days (Figure 2, page 20). This was based on populations of 157,444 female dogs and 53,063 female cats.

The average age of dogs undergoing castration was 10 months, 21 days and the average age of cats was 7 months, 14 days (Figure 3, page 20). This was based on populations of 160,460 male dogs and 56,280 male cats.

Important findings

During this five-year period, Banfield hospitals performed approximately 1 million surgical procedures that were accompanied by preanesthetic laboratory assessment in conjunction with a complete medical history and physical examination. Abnormal results were found in all parameters of testing. Approximately 9 percent of Pets evaluated had one or more abnormal values, which triggered a careful review of all case data and decisions on whether to proceed with anesthesia, repeat the blood work or cancel the procedure. Some of the parameters that are most often abnormal are shown in Table 2.

A breakdown by species revealed that in dogs, 3.6 percent of those tested

Table 1: Weight before Surgery

Group	Weight	Percent Screened
Large dog	(> 30 lbs)	98%
Medium dog	(10 to 30 lbs)	97%
Small dog	(< 10 lbs)	96%

Table 2: Frequency of Some Abnormal Laboratory Results: Preanesthetic Screens*

Cat (254,530)		
Parameter	Criterion	Percent
PCV	< 25%	0.6%
RBC	< 4 x 10 ⁶ /µl	1.2%
MCV	> 55 fl	0.0%
Platelets	< 50 x 10 ³ /µl	1.6%
Creatinine	> 3 mg/dl	1.8%
ALT	> 150 IU/L	1.1%
AST	> 150 IU/L	3.6%
WBC	> 25 x 10 ³ /µl	2.0%

Dog (738,276)		
Parameter	Criterion	Percent
PCV	< 35%	0.9%
RBC	< 4 x 10 ⁶ /µl	0.4%
MCV	> 80 fl	0.0%
Platelets	< 100 x 10 ³ /µl	1.7%
Creatinine	> 3 mg/dl	1.6%
ALT	> 150 IU/L	0.9%
AST	> 150 IU/L	2.7%
WBC	> 20 x 10 ³ /µl	2.0%

*Note: These values are well outside Banfield's normal range.

Figure 1: Five-Year Average for Elective Procedures

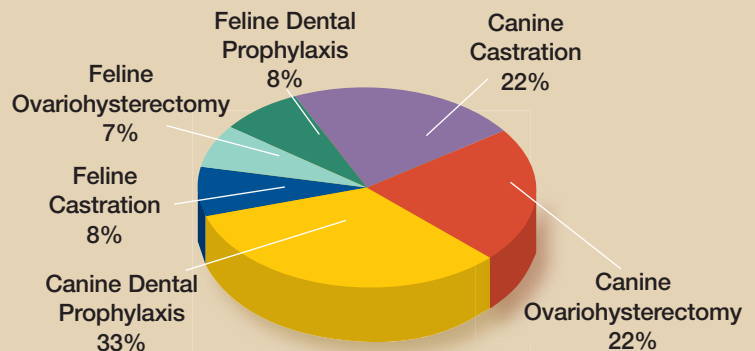


Figure 2: Age of Pets Undergoing Ovariohysterectomy

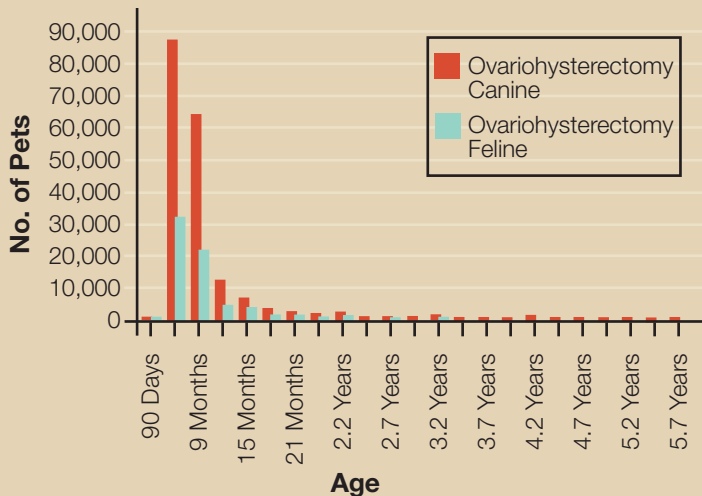
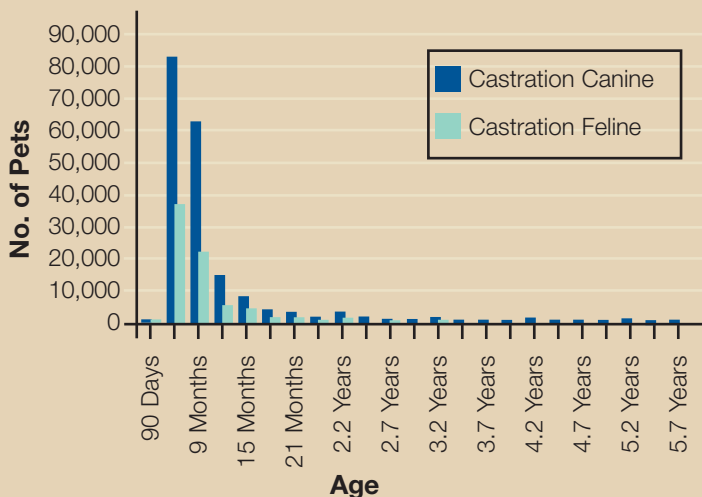


Figure 3: Age of Pets Undergoing Castration




were found to have one abnormal test value; 0.4 percent had two abnormal values and only 0.1 percent had three or more abnormal values. In cats, 19 percent of those tested had one abnormal test value; 2.1 percent had two abnormal test values, and 0.2 percent had three or more abnormal values.

A complete review of the laboratory data of Pets with abnormal findings showed that 79.8 percent had one abnormal result while

16.6 percent had two abnormal values and 3.6 percent of Pets had three or more abnormal values. Further evaluation, either through additional testing or examination, was warranted by the clinician.

It is important to identify and evaluate all abnormal findings before anesthesia to ensure the safest outcome for the Pet. Further investigation is required by the doctor to rule out potential complications. In this study, approximately 90,000 abnormalities were identified. After evaluation, which often included additional testing or examination, an overwhelming majority (99.9 percent) of the procedures were performed without delay while others were postponed (0.1 percent).

In some cases of apparently healthy Pets being admitted for elective surgery, preanesthetic testing led to the cancellation of surgery because of elevated BUN or creatinine levels (more than 1,300 cases), anemia (more than 100 cases) or elevated hepatic enzyme activities. Among the conditions uncovered during preanesthetic screening include renal disease, anemia, pyometra, neoplasia, hepatopathy and cardiac disease.

In summary, the preanesthetic evaluation is a critical component of quality medicine. It provides data to determine the health status of a Pet prior to anesthesia in an effort to minimize the risk of adverse events and identify if a change in anesthetic protocol is necessary. It also allows the establishment of normal baseline values for individual Pets. 

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