



The Scalpel

NEWSLETTER OF THE TORONTO ACADEMY OF VETERINARY MEDICINE

VOL. 30, #2 MAR. 2014

Guest COLUMN

Dr. Jinelle Webb
& Dr. Kirsten Prosser

Routine wellness screening involves the annual or bi-annual serum biochemical profile, complete blood count, and urinalysis evaluation of patients with an absence of clinical signs. Wellness screening is an important aspect of preventative medicine, which aims to allow early intervention as opposed to treating or curing the symptoms of disease. If abnormali-

Should we be performing wellness blood and urine testing?

ties can be detected on the wellness screen, potentially indicating the presence of subclinical pathology, further diagnostic testing and treatment can be instigated prior to the onset of clinical disease. Similarly, pre-operative blood screening in apparently healthy patients prior to elective procedures requiring sedation or general anesthesia can significantly minimize morbidity and mortality if alterations in blood parameters are identified and addressed. Annual or biannual wellness testing can be employed not only for the detection of occult disease, but to provide a baseline or benchmark for later comparison or trending if the patient's current results are within the normal limits. The ability to compare and trend current and historical results can aid the clinician in determining the



significance of an abnormality and whether ongoing monitoring, further investigation, or medical intervention is required.

Certain diseases tend to remain occult until quite late in their course. Severe proteinuria can occur in patients with protein-losing nephropathy without any outwards signs, including polyuria and polydipsia. In some cases, ascites due

Continued on page 5

In this ISSUE

Should we be performing wellness blood and urine testing page 1

Message from TAVM president Cheryl Birss page 3

What's your diagnosis: Neurology page 5

What's your diagnosis: Surgery page 7

Continuing Education for April and May page 10

Advice to Clients Regarding Dog Trainers page 16

In the NEWS

Interesting and fun news snippets regarding our favourite four-legged friends page 18

Continuing Education

VETERINARY SERIES

Tuesday April 8

Surgical Biopsies: The Power of Partnership

Sponsor:



Tuesday May 13

Dentistry – What We Didn't Learn in School!

Sponsor:



Bayer HealthCare

Upcoming SEMINARS

HOSPITAL PERSONNEL SERIES

Wednesday April 9

The COHAT (Comprehensive Oral Health Assessment and Treatment) Defined

Sponsor:



Wednesday May 14

How Technicians Can Excel in Emergency and Critical Care

Sponsor:



For complete SEMINAR INFORMATION turn to page 10 - 11

Should we be performing wellness blood and urine testing?

Continued from page 1

to severe hypoalbuminemia can occur with no preceding clinical signs. This can also occur in intestinal lymphangiectasia, without the occurrence of diarrhea and/or vomiting prior to the development of severe hypoproteinemia. In cases of protein-losing nephropathy, a urinalysis early in the course of disease would reveal proteinuria. In cases of intestinal lymphangiectasia, hypoproteinemia may appear in a biochemical profile, and in some patients hypocholesterolemia and lymphopenia are also noted.

Chronic hepatitis is most commonly seen in middle-aged, larger breed dogs such as Dobermans and Labrador Retrievers. Although many dogs that have this disease will exhibit intermittent, vague symptoms such as lethargy and inappetence, some dogs have no clinical signs indicating the presence of hepatic inflammation. In some cases, clinical signs are not noted until the inflammation had led to cirrhosis, and ultimately complete hepatic failure. However, the presence of an elevated ALT on routine blood work indicates the need for additional testing, especially in at-risk breeds.

Extra-hepatic portosystemic shunts and microvascular dysplasia are often discovered on routine blood work performed prior to ovariohysterectomy or orchiectomy in young, small-breed dogs such as the Yorkshire terrier and Pug. These vascular anomalies can present significant anesthetic risk and delayed anesthetic recovery if undetected. In addition, clients can be counseled on the therapy and prognosis associated with this disease prior to the development of cirrhosis or acquired hepatic shunts.

Miniature Schnauzers are predisposed to hyperlipidemia, which is a disorder that progresses with age. Although there can be clinical signs associated with severe hyperlipidemia, the disease is often asymptomatic. Blood work will reveal lipemia in an appropriately-fasted patient, and often liver enzyme elevation is noted. Management is via a low fat diet, and occasionally medication. Early detection of this disease can allow proper dietary intervention.

Chronic renal failure is common in both older cats and dogs. Blood and urine testing may reveal azotemia, or simply inadequate urine concentration. Research has indicated that early intervention can slow the progression of this disease. Identification of patients considered an IRIS (International Renal Interest Society) Stage 1, defined as inadequate urine concentration with no azotemia, allows institution of therapy in the earliest stages. Recent data has indicated a benefit in starting therapy in cases with a normal serum creatinine concentration, but an increase in the creatinine concentration of greater than 20% from the previous assessment. Evaluation of a urinalysis will also screen for cases with proteinuria. Detection of a low urine specific gravity will also prompt the measurement of blood pressure, which can result in the detection of hypertension.

Hypercalcemia can be detected on routine blood work without clinical symptoms present. Differential diagnoses for occult hypercalcemia include neoplasia such as lymphoma and anal gland adenocarcinoma, primary hyperparathyroidism, hypoadrenocorticism, renal disease, vitamin D toxicosis, osteomyelitis, and in some cases and especially in cats, idiopathic hypercalcemia. Undiagnosed hypercalcemia can result in mineralization of organs, especially renal, and also development of calcium-containing urolithiasis. The presence of hypercalcemia should always prompt additional diagnostic steps to determine the underlying cause.

Urolithiasis can present without clinical signs, as can urinary tract infections. In many cases of urolithiasis, crystalluria is also present, prompting additional diagnostic tests. The presence of bacteriuria with appropriate sediment changes, or bacteriuria in a sample obtained appropriately via cystocentesis, should prompt additional diagnostic steps, including bacterial culture of urine obtained in a sterile manner.

While the benefits of routine wellness screening are suspected and supported by veterinarians, there exist no studies proving

this. In addition, only two small, conflicting studies exist examining the benefit of pre-anesthetic blood testing. In 2011, our clinic performed a study assessing the use of routine wellness and pre-anesthetic blood testing. We hypothesized that assessing routine blood work would identify a proportion of clinically healthy dogs and cats with significant abnormalities. We obtained routine blood work results performed at a single external laboratory (Idexx Laboratories Inc, Markham, Ontario) from dogs and cats presenting to 28 primary care veterinarians in Southern Ontario; all patients were assessed as clinically healthy by both the owner and veterinarian.

Data was collected from 1421 dogs and 277 cats, including signalment and 16 biochemical and hematological parameters. There were a similar number of males and females in both the dog and cat population. The canine study population consisted of 125 breeds, and patients were 0.3 to 16 years of age (mean of 6.1 years). Patients in the feline study population were 0.3 to 19 years of age (mean of 7.8 years) and were categorized as either domestic or exotic breed, with a minority being exotic and representing 12 breeds.

Within the canine population, 41.9% had one or more abnormalities that were considered significant present (Figure 1 - see page 8). The majority of statistically significant biochemical and hematological abnormalities were present in patients of a mean age of seven years or greater. Abnormalities included hypoalbuminemia, hyperglobulinemia, elevated hepatic enzyme activity (ALT, ALP), azotemia, hyperglycemia, hyperkalemia, hypo- or hypercalcemia, anemia, erythrocytosis, thrombocytopenia confirmed by blood smear evaluation, thrombocytosis, lymphocytosis, eosinophilia, neutropenia, and neutrophilia (Figure 2 - see page 8). Hypoalbuminemia, elevated ALT and ALP enzyme activities, elevated serum urea and creatinine concentrations, alterations in hematocrit, alterations in platelet count,

Continued on page 8

Should we be performing wellness blood and urine testing?

Continued from page 5

and alterations in neutrophil count were noted more frequently in older dogs. In addition, the severity of the increase was correlated with increasing age for ALP and ALT enzyme activity and serum creatinine concentration. Elevated ALP enzyme activity was more likely to be present in females compared to males. Female patients in the study population were also more likely to have marked neutrophilia or alterations in hematocrit.

Regarding individual dog breeds, Jack Russell Terriers were more likely to have elevated serum creatinine concentration or hypoalbuminemia, Shih tzus were more likely to have elevated ALP enzyme activity or BUN concentration, and German Shepherd Dogs were more likely to have an elevated serum creatinine concentration when compared to the study population.

Within the feline study population, 65.7% of patients had abnormalities that were considered significant, including hypoalbuminemia, hyperglobulinemia, elevated hepatic enzyme activity (ALT, ALP), azotemia, hyperglycemia, hypo- or hyperkalemia, hypercalcemia, elevated serum thyroxine (T4) concentration, anemia, erythrocytosis, thrombocytopenia confirmed by blood smear evaluation, thrombocytosis, lymphopenia, lymphocytosis, eosinophilia, neutropenia, and neutrophilia (Figures 3 & 4). The majority of statistically significant biochemical and hematological abnormalities were present in patients of a mean age of nine years or greater.

Elevated ALT, ALP enzyme activities, elevated serum urea concentration, elevated serum creatinine concentration, elevated serum T4 concentration, and alterations in neutrophil count were noted more frequently in older cats. In addition, the severity of the increase for neutrophilia or neutropenia was correlated with increasing age. If a patient had an elevated serum creatinine concentration, they were likely to have an elevated serum urea concentration. In the study population, 75% of patients with an elevation in one or both serum renal pa-

rameters were 11 years or older. All patients with an elevated serum T4 concentration were 14 years or older.

It has been theorized that wellness blood and urine testing will be useful in detecting occult disease. This study supports the use of wellness blood screening in the general dog and cat population, and helps to give some broad parameters for age, and in some cases for breed, testing. Routine wellness testing is of particular importance in dogs seven years or greater to aid in the detection of occult disease; this trend is similar in cats, where common diseases such as chronic renal failure and hyperthyroidism occurred in older patients. In addition, although not assessed in our study, obtaining a urine sample along with blood at wellness examination, although sometimes challenging, is important for the detection of occult disease.

As vaccination of companion animals becomes less frequent than annually, it becomes important to counsel pet owners on the importance of a yearly wellness examination. In fact, there is a trend towards avoiding the term 'yearly vaccine appointment', to highlight the importance of a detailed history, thorough physical examination including rectal palpation, and blood and urine testing. If a mild deviation outside of the normal range is noted on laboratory testing, many owners will question the importance of further diagnostic testing. In many cases, mild changes can be monitored a few weeks later, and additional diagnostic testing withheld until an assessment can be made regarding resolution of change versus progression. However, counseling owners about the possible disease processes related to the abnormal laboratory value early in this process may help if additional diagnostic testing is indicated.

In fact, in our increasingly technological world, clients will often do their own research on the internet, where both good and bad information exists. Providing written information for your clients on the basics of the possible disease process is likely to help in follow-up conversations. Although it is reasonable to write your own summaries

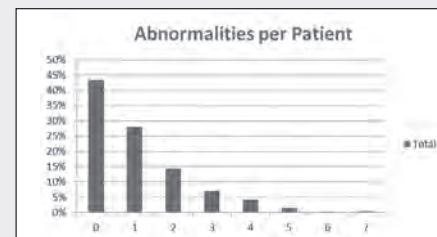


Figure 1: Distribution of total number of serum biochemical or complete blood count abnormalities present in individual dogs.

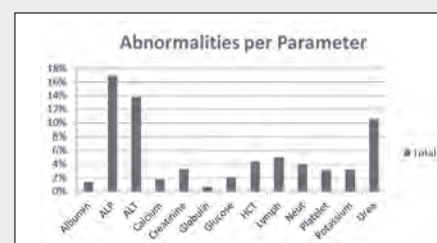


Figure 2: Percentage of abnormal results within the canine population obtained for individual serum biochemical and complete blood count parameters.

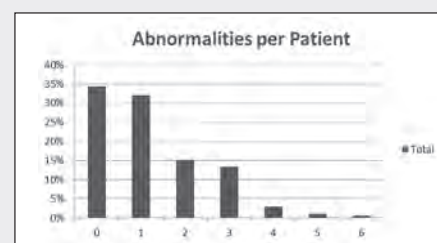


Figure 3: Distribution of total number of serum biochemical or complete blood count abnormalities present in individual cats.

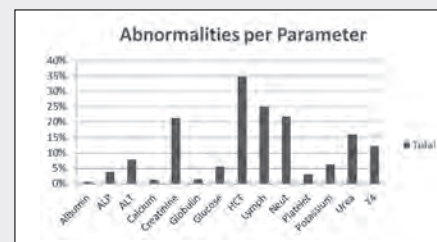


Figure 4: Percentage of abnormal results within the feline population obtained for individual serum biochemical and complete blood count parameters.

of common, occult disease processes, there are client hand-outs on a large number of diseases available to you and your client. Some of these allow you to add your clinic information to the client hand out. Examples of client hand-out resources include www.veterinarypartner.com, and online ac-

Continued on page 13

What is your Diagnosis: Surgery

holding submucosal layer of the bladder wall is critical.² Ideally, the suture pattern should not penetrate the mucosa to avoid producing a potential nidus for calculi formation^{6,12} or exposing the suture to infected urine, which could result in premature loss of tensile strength.^{16,17} This may be difficult to achieve in thin-walled bladders.² Most relatively healthy bladders can be closed with a single-layer, simple, continuous appositional pattern. If there is concern about urine leakage postoperatively (for example, in a thin-walled bladder), the closure can be oversawn with an inverting continuous suture pattern (Cushing or Lembert).^{2,18} In a thickened or friable, diseased bladder, a serosal patch may be used to augment a cystotomy closure.²

Take home message:

There is not one suture that will close every bladder with no risk for associated complications. Until more information is available, **the use of monofilament absorbable suture remains the rule.** To choose the best suture among this group, risk factors specific to the patient must be considered, particularly the risk of recurrence and the presence of infection. If the risk of recurrence is the primary concern, for example in predisposed breeds, a short lasting suture such as poliglecaprone 25 could be a good choice. If current infection is documented or suspected, a more resistant suture such as polyglyconate or polydioxanone may be a better choice. Whatever the type of suture used, reducing the recurrence can also be accomplished by taking only partial thickness bites of the mucosa. While doing so, the practitioner must keep in mind that **incorporating the submucosa is mandatory** for ensuring adequate strength of the closure.

Dr. Sylvain Bichot graduated in Toulouse (France) in 2003. He completed an internship in Small Animal Surgery and Medicine in Saint-Hyacinthe (Québec) in 2004.

After working in private practice in France, Dr. Bichot returned to Canada where he completed a residency in Small Animal Surgery and a DVSc at the Ontario Veterinary College, University of Guelph in 2011.

During his residency, Dr. Bichot's research focused on biomechanical evaluation of surgical implants. Dr. Bichot is a diplomate of the American College of Veterinary Surgeons. After completing his boards, he worked as a Faculty Surgeon at the OVC (University of Guelph). He is now completing a Master of Science about osteoarthritis.

When not at the Mississauga-Oakville Veterinary Emergency Hospital, Dr. Bichot enjoys spending time with his wife, his two kids and his dog, Eco.

References:

1. Osborne, CA, Lulich, JP, Kruger, JM, et al.: Analysis of 451,891 canine uroliths, feline uroliths, and feline urethral plugs from 1981 to 2007: perspectives from the Minnesota Urolith Center. *Vet Clin North Am Small Anim.* 39, 2008, 183.
2. Tobias and Johnston. *Veterinary Surgery: Small Animal.* W.B. Saunders Company. p. 1978-90
3. Lulich, JP, Perrine, L, Osborne, CA, et al.: Postsurgical recurrence of calcium oxalate uroliths in dogs [abstract]. *J Vet Intern Med.* 6, 1992, 119.
4. Lekcharoensuk, C, Osborne, CA, Lulich, JP, et al.: Association between dietary factors and calcium oxalate and magnesium ammonium phosphate urolithiasis in cats. *J Am Vet Med Assoc.* 219, 2001, 1228.
5. Gatoria, IS, Saini, NS, Rai, TS, et al.: Comparison of three techniques for the diagnosis of urinary tract infections in dogs with urolithiasis. *J Small Anim Pract.* 47, 2006, 727.
6. Appel, SL, Lefebvre, SL, Houston, et al.: Evaluation of risk factors associated with suture-nidus cystoliths in dogs and cats: 176 cases (1999-2006). *J Am Vet Med Assoc.* 233(12), 2008, 1889.
7. Grier, RL: Symposium on surgical techniques in small animal practice. Cystotomy. *Vet Clin North Am.* 5, 1975, 415.
8. Hastings, JC, Van Winkle, W, Barker, et al.: The effect of suture materials on healing wounds of the bladder. *Surg Gynecol Obstet.* 140, 1975, 933.
9. Morris, MC, Baquero, A, Redovan, E, et al.: Urolithiasis on absorbable and non-absorbable suture materials in the rabbit bladder. *J Urol.* 135(3), 1986, 602.
10. Cornell, KK: Cystotomy, partial cystectomy, and tube cystotomy. *Clin Tech Small Anim Pract.* 15, 2000, 11. Fossum TW. *Small Animal Surgery.* 2nd ed. St. Louis, Missouri: Mosby; 2002.
12. Kaminski, JM, Katz, AR, Woodward, SC: Urinary bladder calculus formation on sutures in rabbits, cats and dogs. *Surg Gynecol Obstet.* 146(3), 1978, 353.
13. Julian, TB, Ravitch, MM: Closure of the urinary bladder with stainless steel and absorbable staples. *Ann Surg.* 204(2), 1986, 186.
14. Hepperlen, TW, Stinson, W, Hutson, F, et al.: Epithelialization after cystotomy. *Invest Urol.* 12(4), 1975, 269.
15. Kusan, M, Gonulalan, U, Ozturk, B, et al.: Tissue reactions of suture materials (polyglactine 910, chromed catgut and polydioxanone) on rat bladder wall and their role in bladder stone formation. *Urol Res.* 36(1), 2008, 43.
16. Greenberg, CB, Davidson, EB, Bellmer, DD, et al.: Evaluation of the tensile strengths of four monofilament absorbable suture materials after immersion in canine urine with or without bacteria. *Am J Vet Res.* 65(6), 2004, 847.
17. Schiller, TD, Stone, EA, Gupta, BS: In vitro loss of tensile strength and elasticity of five absorbable suture materials in sterile and infected canine urine. *Vet Surg.* 22(3), 1993, 208.
18. Radasch, RM, Merkley, DF, Wilson, JW, et al.: Cystotomy closure, a comparison of the strength of appositional and inverting suture patterns. *Vet Surg.* 19(4), 1990, 283.

Should we be performing wellness blood and urine testing?

Continued from page 8

cess to the Textbook of Veterinary Internal Medicine (Ettinger SJ and Feldman EC).

Once it is determined that an abnormality warrants further diagnostic testing, it is important to have the entire veterinary team well educated in the presence of occult disease, and the importance of early intervention in some of these disease processes, in order to present a united front to the client. It can be a difficult decision for clients to pursue additional testing, both from a financial and invasiveness perspective. They may ask the opinion of technicians, kennel staff, and receptionists, as long term clients often become very close to these team members. Education regarding the disease process, for veterinary staff and the client, becomes to foundation for early detection and treatment of occult disease.

We would like to express our thanks to the referral veterinary community for their participation and support of the study discussed in this article. Financial support of the study was obtained from Royal Canin Canada. This data was presented at the 2013 ACVIM Forum and 2014 OAVT conference, and a manuscript is in preparation for submission to JAAHA.

References:

1. Epstein M, Kuehn NF, Landsberg G, et al. AAHA senior care guidelines for dogs and cats. *J Am Anim Hosp Assoc* 2005;41:81-91.
2. Alef M, von Praun F, Oechtering G. Is routine pre-anaesthetic haematological and biochemical screening justified in dogs? *Vet Anaesth Analg* 2008;35:132-140.
3. Joubert KE. Pre-anaesthetic screening in geriatric dogs. *J S Afr Vet Assoc* 2007;78:31-35.
4. Nelson RW and Couto CG. *Small Animal Internal Medicine*, 4th Edition. St Louis: Mosby Elsevier; 2008.
5. Webb JA, Kirby GM, Nykander SG, Gauthier MJ. Ultrasonographic and laboratory screening in clinically normal mature golden retriever dogs. *Can Vet J.* 2012 Jun;53(6):626-30.

Dr. Jinelle Webb received her DVM in 2001 from the Ontario Veterinary College where she graduated with distinction. From 2001 to 2002, Dr. Webb completed a rotating internship in small animal medicine and surgery at the OVC.

An interest in small animal internal medicine led to her entering the Ontario Veterinary College's DVSc program in internal medicine in 2002. She completed her DVSc in 2005, and obtained board certification with the American College of Veterinary Internal Medicine that year. From 2005 to 2006, she worked at the Veterinary Emergency Clinic in Toronto, Ontario.

In 2006, Dr. Webb moved to the Mississauga-Oakville Veterinary Emergency Hospital and Referral Group to start its Internal Medicine service. Dr. Webb has spear-headed our rotating internship and Internal Medicine residency programs. She is also an Adjunct Professor at the OVC.

Dr. Kirsten Prosser completed a Bachelor of Science degree at the University of Guelph, Ontario, in 2003. She subsequently pursued her veterinary degree in Perth, Australia; graduating with honours from Murdoch University with a Bachelor of Veterinary Medicine & Surgery in 2007. Upon returning to Ontario, Dr. Prosser completed a one-year rotating internship in small animal medicine and surgery at our Hospital. After completing the internship, Dr. Prosser worked in Mississauga in both general practice and with the emergency service at our Hospital.

Dr. Prosser returned to our Hospital in June 2011 to commence an ACVIM approved three-year clinical Internal Medicine Residency. As part of her residency program, she is researching the benefits of routine blood and urine testing in healthy cats and dogs. A goal of this project is to make recommendations on the best timing to perform this testing based on a pet's age and breed.