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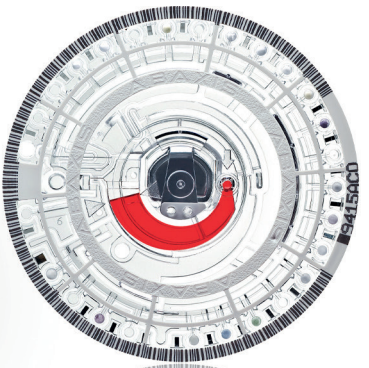
VS2

Profile Utilisation Guide



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Contents

Increasing Care Standards and Revenue with Point–of–Care Testing

At What Age Should Diagnostic Testing Begin?

Diagnostic testing can identify subclinical disease at any age.

Renal insufficiency caused by inflammatory or infectious processes, congenital renal disease, hepatopathy and congenital hepatic shunts are just a few of the potential abnormalities found in young patients presenting without clinical signs.

Pre-anaesthetic testing in all age groups is a form of wellness testing and can detect subclinical disease prior to anaesthetic and surgery, which may change your surgical premedication or anaesthetic protocol, delay the procedure or provide a need for additional diagnostics.

Benefits of Point-of-Care Testing

Patient Benefits

- Establish baseline values for important organ function
- Not all normal patients have normal values
- Changes within the normal range (elevations above baseline) can be clinically significant (e.g., creatinine)
- Identify disease at an early stage
- Usually improves prognosis and response to therapy
- Increases quality and length of life
- Provides pre-anaesthetic information
- Assess organ function and evaluate for short-term or chronic use of medications

Practice Benefits

- Delivering a high standard of clinical care
- Early disease detection and intervention can improve job satisfaction for both veterinarian and staff.
- Enhanced productivity and increase staff involvement
- Reduces sample handling time and having to run multiple tests/ using external labs
- Increase profits
- Improve practice image/referrals
- Improve client communication, education and compliance
- Ability to perform immediate additional diagnostics if necessary
- Easily and effectively expand wellness testing

Patient Owner Benefits

- Offer affordable patient diagnostics for clients to encourage compliance on an annual basis
- Often reduces cost of treatment
- Peace of mind for the client, vet and staff
- Provide face-to-face personal explanation of results, increasing value and image
- Improves the human-animal bond

vetscan VS2

Test Portfolio

Comprehensive

- Comprehensive Diagnostic Profile

Pre-Anaesthetic + Critical Care

- Prep Profile II
- Electrolyte Plus

Organ Specific

- Kidney Profile Plus
- Mammalian Liver Profile

Specialty Testing

- Phenobarbital Profile
- T4/Cholesterol Profile

Species-Specific

- Avian/Reptilian Profile Plus
- Equine Profile Plus
- Large Animal Profile

The **VETSCAN VS2** is amazingly simple and intuitive. It features precise reference laboratory quality results in 12 minutes from 100 µl of whole blood, serum or plasma.

With its advanced user interface, built-in iQC® (intelligent Quality Control), small footprint and portability it is ideal for **veterinary practices, hospitals** and **research laboratories.**

VETSCAN VS2

Comprehensive Diagnostic Profile

Ideal For

Providing complete chemistry and electrolyte analysis for pre-anaesthetic, general health, sick patient, geriatric and wellness testing.

Used For

- Establishing new patient baselines
- Wellness exams for young, adult and geriatric patients
- Health screening prior to administering anaesthetic or sedation
- Sick patients and critical care cases
- Recheck examination for administering medications or managing chronic disease

Parameters

ALB	ALP	ALT	AMY	BUN	Ca	CRE
GLOB	GLU	K^+	Na^+	PHOS	TBIL	TP

Profile Utilisation

Benefits of In-house Chemistry Testing

In-house testing enables the veterinary surgeon to evaluate a pet's general health and become aware of any health problems at the point of care. The combination of immediate results and the complete chemistry information provided by the panel allows for earlier diagnosis and treatment when indicated.

Disease Diagnosis

The tests included on the Comprehensive Diagnostic Profile provide the clinician with the chemistry and electrolyte information necessary to obtain:

- Immediate test results
- Narrowed differential diagnosis list
- Information necessary to determine the need for additional tests or procedures

Pre-Anaesthetic Evaluation

As part of the pre-anaesthetic evaluation, the Comprehensive Diagnostic Profile provides a full range of chemistry tests plus evaluation of the electrolytes needed to evaluate fluid therapy needs — tests vital to best practices in anaesthetic protocols. The ability to perform the tests the day of the procedure provides:

- Evaluation of the patient in real time
- Lower client and hospital costs
  - › Reducing client and patient time in the hospital prior to the procedure
  - › No need for additional patient visits to obtain blood prior to the day of surgery

Recheck Evaluations for Chronic Disease

Many of the diseases treated in practice are chronic and require ongoing monitoring. Regular blood testing is an essential part of this to ensure correct medication levels and an assessment of patient stability.
It is important, therefore, to offer a fast, accurate cost-efficient test.
The Comprehensive Diagnostic Profile provides 14 parameters that give clinicians a more complete picture of the patient's disease status than narrower testing options. For example, regular evaluation of the patient BUN and creatinine in the chronic renal patient may seem medically and economically reasonable. However, renal patients often exhibit some or all of the following during the course of disease:

- Protein loss, especially albumin, from the kidney
- Inflammation or infection of the urinary system
- Elevated phosphorus levels
- Secondary parathyroid disease leading to calcium and phosphorus abnormalities
- Electrolyte abnormalities, especially K^+
- Reduced GFR indicated by elevated amylase levels (among other values) [1]

From these points alone, it is important to test not only BUN and creatinine, but also total protein, ALB, GLOB, PHOS, Ca, Na^+, K^+ and AMY. Additionally, these patients often exhibit other conditions where evaluation of hepatic values and glucose, for example, are necessary. A tiered pricing structure for this panel allows for excellent client compliance.

Preventive Care Testing

The complete testing offered by the Comprehensive Diagnostic Profile is perfect for the wellness patient during a routine visit.

Immediate results allows for:

- Ability to discuss the results with the client during the visit, providing increased value
- Additional diagnostics with the patient already in the exam room and the owner present
- Improved compliance and increased referrals
- Increased customer satisfaction
- Best diagnostics based on a complete profile

The Value for Each of These Uses Is Enhanced By

Immediate Results

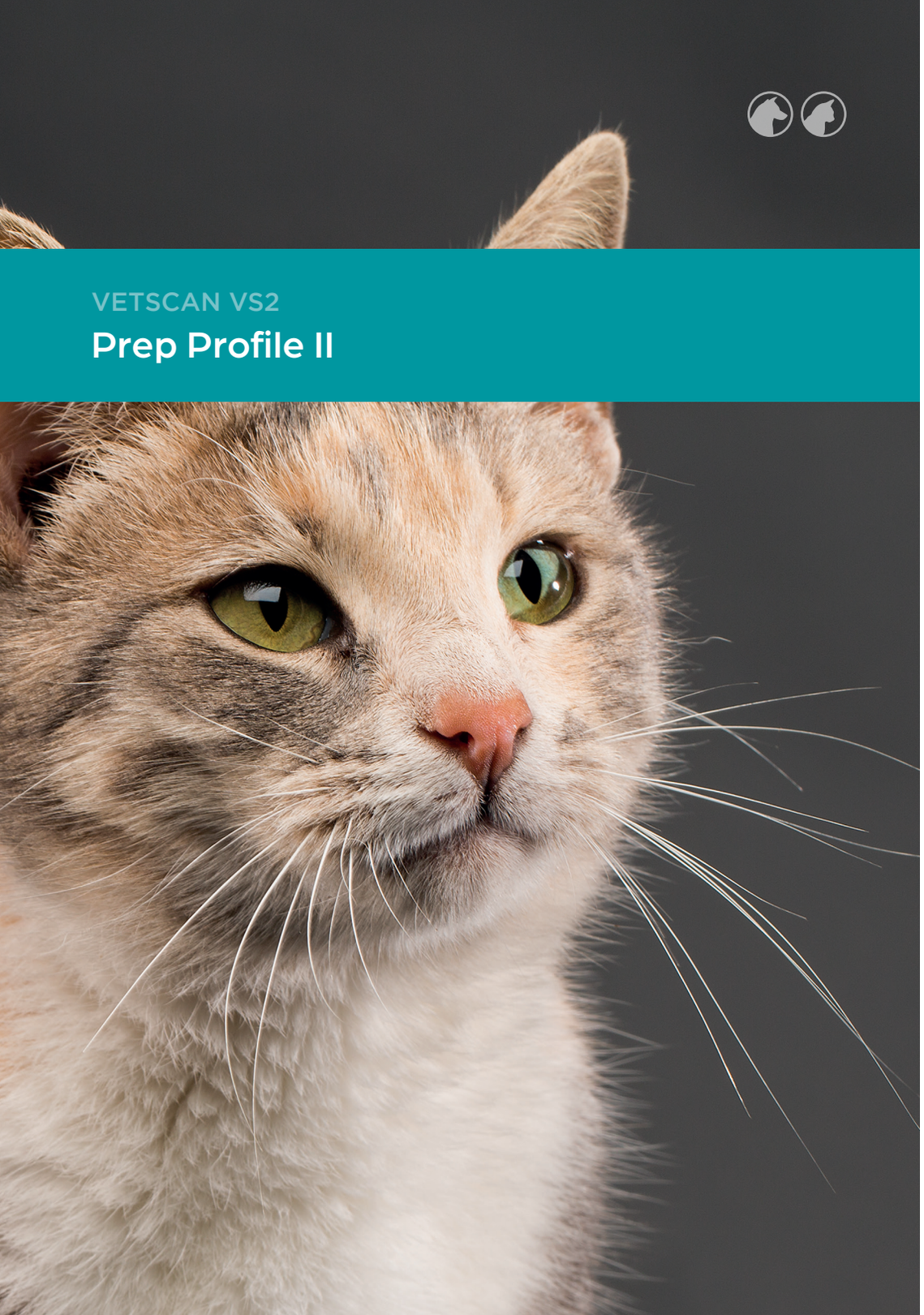
- Provides ability to discuss results with owners
- Reduces the need for multiple follow up phone calls
- Increases compliance
- Improves value
- Reduces client stress
- Increase additional testing and diagnostics through enhanced information, value and client understanding

Small Sample Volume

- Reduced stress on the patient
- Capability of running multiple tests per sample
- Improved sample quality

Time

- Time is saved for the owner and veterinarian with in-clinic testing
- Reduce phone time to contact clients
- Reduce unnecessary visits
- Increase necessary visits based on improved medicine, compliance and client communication



VETSCAN VS2

Prep Profile II

Ideal For

Basic health screen for pre-anaesthetic evaluation and testing minimal values for baselines of young, healthy patients or recheck profile for some disease states.

Used For

- Lower-cost option for clients to perform wellness screening for young pets
- Pre-anaesthetic screening for common surgeries on apparently healthy, young patients for dental procedures, ovariohysterectomies and castrations
- Recheck for disease states such as diabetes mellitus and renal disease

Parameters

ALP | ALT | BUN | CRE | GLU | TP

Profile Utilisation

The Prep Profile II provides basic values for the clinical evaluation of young, apparently healthy patients as well as values commonly utilised for rechecks.

Pre-Anaesthetic Testing

The 6 tests available on the Prep Profile II profile are chemistry values commonly evaluated prior to procedures involving sedation or anaesthesia. These values provide baseline information regarding:

- Renal health: BUN and CRE
- Hepatic health: ALT, ALP and GLU
- Hydration: TP and BUN
- Metabolism: GLU

Should abnormalities be identified, additional testing can be performed utilising other profiles such as the Comprehensive Diagnostic Profile or the Mammalian Liver Profile.

Preventive Care Testing

Preventive Care testing may help identifying patients with a subclinical disease early, increases diagnostics in other areas of the practice and improves the quality of medicine provided by the practice.[4]

In addition, a completely normal wellness panel provides great peace of mind for the veterinary staff and pet owner.

The Prep Profile II provides important parameters often used in wellness testing of the young, apparently healthy patient. As with pre-anaesthetic testing, additional testing can be performed with other panels should abnormalities be observed.

Recheck Evaluations and Hospital Monitoring

The Prep Profile II provides important information for renal, hepatic and diabetic patients being hospitalised, monitored, or undergoing long-term treatment. The lower cost of the profile provides basic necessary values for cost-sensitive clients or for the clinician who has determined the need to monitor only the basic values provided.

- GFR and hydration: BUN and CRE
- Hydration and protein loss (renal, gastrointestinal, etc.): TP
- Metabolism, hepatic function and concurrent diabetes: GLU
- Hepatic cellular necrosis or leakage: ALT
- Hepatic swelling and endocrine screen: ALP

It is important to remember that many chronically ill patients often develop multiple organ failure. For example, the renal patient often develops hepatic disease.[5] Therefore, monitoring the baseline values with the Prep Profile II provides a more complete picture of the patient's status than single parameters, allowing better treatment decision to be made.

VETSCAN VS2

Electrolyte Plus

Ideal For

Evaluation of acid/base and osmotic balance for baseline on hospitalised patients.

Used For

- Check the electrolytes general status of the patient
- Provides important information for monitoring fluid therapy and acid-base values
- Perform recheck examinations for certain conditions that involve alterations of electrolyte and/or acid-base balance
- Monitor endocrine diseases in between full panel rechecks

Parameters

Cl^- | K^+ | Na^+ | tCO_2

Profile Utilisation

The electrolyte measure provides valuable information for the practitioner about patient health and internal organs function. The organs that are most important in maintaining all serum electrolyte levels are the kidney and gastrointestinal (GI) system. But additional regulatory mechanisms, as well as the consequences and causes of imbalances, should be addressed along side other results and the patient's clinical condition.

Maintaining the intra- and extracellular concentration of each electrolyte within narrow limits is essential to life.[6]

The Electrolyte Plus profile provides the following parameters:

- Sodium, used to diagnose causes and monitor vomiting, diarrhoea and cardiac symptoms as well as states of dehydration, and diabetes.
- Potassium, used with sodium to diagnose causes and monitor GI and cardiac symptoms as well as malnutrition and renal disease.
- Chloride, used to diagnose causes and monitor chronic diarrhoea, chronic vomiting, renal disease, parathyroid disease, chronic respiratory acidosis or alkalosis, hyperadrenocorticism, hypoadrenocorticism, and thiazide therapy.
- tCO_2, used to determinate primary metabolic alkalosis and acidosis and primary respiratory alkalosis and acidosis.

Having a more complete electrolyte picture helps the clinician to provide targeted treatment for their patients.

Acid-Base Analysis and the Interpretation of tCO_2

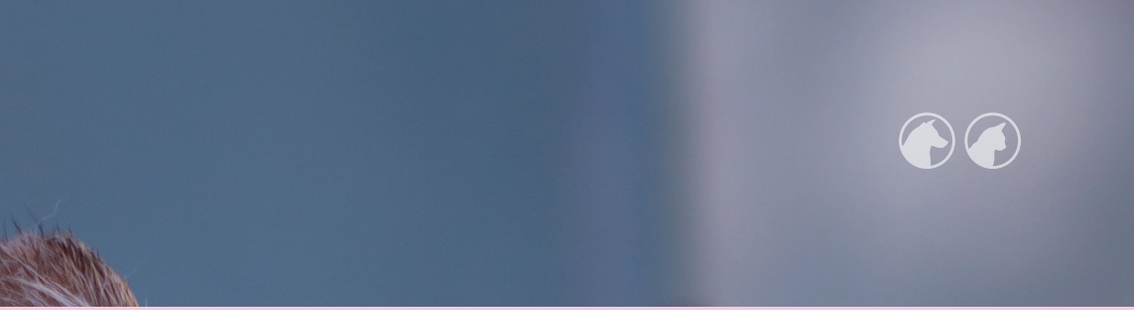
tCO_2 should be interpreted considering history, signalment, physical examination, clinical signs and other laboratory data. A tCO_2 value outside the reference range is equivalent to a bicarbonate level outside the normal range. In general, this can be interpreted as [8]:

tCO_2 **Decreased**	Consistent with Metabolic **Acidosis**
tCO_2 **Increased**	Consistent with Metabolic **Alkalosis**

If tCO_2 is abnormal, the clinician must determine whether complete acid-base analysis is warranted (measurement of pH, pCO_2, HCO_3, Anion Gap, +/- Base Excess) or if the patient should be treated based on tCO_2 alone.[8] This depends on availability of additional tests, patient condition, economics, original diagnosis, etc.

Many other factors, including electrolytes, proteins, ketones, lactic acid, uremic acids, and metabolites of ethylene glycol and HCO_3 can affect the acid-base status of the patient. Additionally, the calculation of the anion gap can indicate the presence or absence of these factors.

Anion Gap = $(Na^+ + K^+) - (Cl^- + tCO_2)$
An increased anion gap is most often seen with metabolic acidosis due to lactic, keto-, or uremic acids or the presence of other metabolites (ethylene glycol). A decreased anion gap is uncommon, and seen most frequently with hypoalbuminemia.



VETSCAN VS2

Kidney Profile Plus

Ideal For

Kidney evaluation and monitoring in cats and dogs of all ages as well as implementing and streamlining your renal function monitoring protocol.

Used For

- Monitoring patients on medication toxic to the renal system
- Monitoring Addisonian patients
- Blocked cats (lower urinary tract disease)

Parameters

ALP | BUN | Ca | Cl^- | CRE | GLU | PHOS

K^+ | Na^+ | tCO_2

Profile Utilisation

Kidney disease is a common reason for both cats and dogs to present to a practice and is a disease that requires quick diagnosis and close, ongoing monitoring. The Kidney Profile Plus includes essential kidney specific parameters as well as complete electrolytes and initial acid-base evaluation. It is therefore useful not only for initial diagnosis, but also for cost-effective monitoring of chronic patients.

Featured Tests

- Albumin (ALB)
- Blood Urea Nitrogen (BUN)
- Calcium (Ca+)
- Chloride (CL-)
- Creatinine (CREA)
- Glucose (GLU)
- Phosphorus (PHOS)
- Potassium (K+)
- Sodium (Na+)
- Total Carbon Dioxide (tCO2)

The Kidney Profile Plus is designed for use with the VS2 Chemistry Analyser with accurate results in 12 minutes.

Background

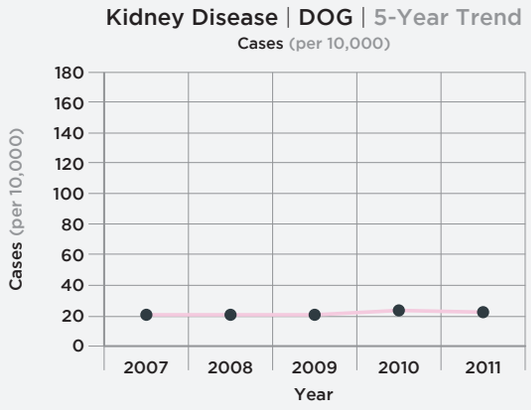
Kidney disease typically affects older animals.

- Half of all cats with kidney disease are >7 years old
- Half of all dogs with kidney disease are >10 years old

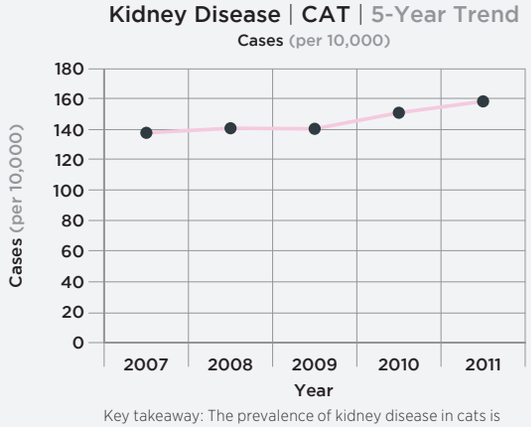
Kidney disease is 7 times more common in cats than it is in dogs. In 2011, 1 in every 12 geriatric cats had some form of kidney disease.[10]

Using the Kidney Profile Plus in combination with other measures such as blood pressure can help to give a clear picture of the patient's disease state and aid clinicians in deciding the best course of treatment.

Cases Per Year



Key takeaway: Despite the low overall prevalence over the last five years, kidney disease can be a serious problem for geriatric dogs. In fact, since 2007 the prevalence increased almost 22 percent in this age group.



Key takeaway: The prevalence of kidney disease in cats is on the rise with a 15 percent increase since 2007. Most cats diagnosed in the early stages of chronic kidney disease live about two to three years, whereas most cats diagnosed in later stages live less than six months after diagnosis.

Source: Kidney Disease, 2001, *Banfield Pet Hospital, State of Pet Health 2012* p. 23.

VETSCAN VS2

T4/Cholesterol Profile

Ideal For

Routine screening of hypothyroidism in dogs and diagnosis of hyperthyroidism in cats, titrating and monitoring patients on thyroid hormone replacement therapy or patients being treated for hyperthyroid disease.

Used For

- Screening for hypothyroidism in dogs
- Titration and monitoring of thyroid hormone replacement therapy
- Diagnosis of hyperthyroidism in cats
- Monitoring drug, I-131 or thyroidectomy therapy

Parameters

T4 CHOL

Profile Utilisation

Thyroid disease in dogs and cats is one of the most common endocrine disorders seen in the veterinary practice.[11] Therefore, using the T4/Cholesterol Profile at the point of care will enhance patient care, improve veterinary diagnostics and provide additional practice revenue.

CANINE Hypothyroidism

Canine hypothyroidism disease results from an inadequate level of thyroid hormone. Although there are other less common causes, the majority of hypothyroid disease is caused by idiopathic thyroid atrophy or autoimmune thyroiditis.[12] The diagnostic challenge for the clinician is to determine:

- The need for thyroid testing
- The proper tests to run and how to interpret the results
- Determination as to whether a diagnosis of thyroid disease or sick euthyroid disease is appropriate

Need for Testing—Screening Hypothyroid Disease

The low cost of the T4/Cholesterol Profile combined with its ease of use, precision and accuracy makes it an outstanding tool to screen patients for the presence of thyroid disease. Some examples of appropriate times to screen patients for hypothyroid disease using the T4/Cholesterol Profile are:

- A patient exhibiting clinical signs consistent with hypothyroidism.

  Some of the more common clinical signs (which can be seen with any endocrine disorder) are[12]:

  › Weight gain
  › Dry coat, alopecia or other skin and hair coat abnormalities (often appear as allergy/atopy) or hyperpigmentation
  › Lethargy, mental dullness or bradycardia
  › Anestrus (intact females)

- Any patient with laboratory abnormalities potentially caused by hypothyroidism[12]:

  › Hypercholesterolemia
  › Anaemia (mild, nonregenerative)
  › Indicators of hepatic changes due to endocrine disorders such as elevations of alkaline phosphatase

- An apparently healthy, middle-age or older patient (especially breeds with predisposition to thyroid disease as part of a wellness testing program)

Since the results of a T4 level are available in minutes, whether additional thyroid testing is required can be immediately determined and discussed with the pet owner. If T4 falls below the reference interval, further evaluation of health status (sick euthyroid syndrome) or send-out testing including free T4 (fT4), Thyroid Stimulating Hormone (TSH) and Thyroglobulin Antibodies (TgAA) is recommended.[12]

With point of care testing the discussion and decision about further testing can occur while the patient is still in the clinic, speeding up the time to diagnosis and treatment where necessary.

Medication Titration and Monitoring

Once a diagnosis of hypothyroid disease has been made, titration of therapeutic medications must be accomplished to the proper level. The goal is to determine:

- Proper dose
- Proper frequency

Patients can undergo a number of changes after starting thyroid medication, including changes in body weight, body condition and basal metabolism. These can all can effect a patient's dosing requirements. Therefore, monitoring of the hypothyroid patient with a T4 level should be performed regularly and the frequency of this sampling will depend on the individual patient.The ability to perform medication monitoring in the practice provides the flexibility to change medication dosing with the client still present. This reduces unnecessary return visits to the practice and improves compliance by allowing a point-of-care discussion with the pet owner regarding the medication change.

T4/Cholesterol Profile

FELINE Hyperthyroidism

Feline hyperthyroid disease is one of the most common endocrinopathies of adult and senior cats, but has been reported in cats of all ages. The disease causes excessive circulating thyroid hormone concentrations resulting in a multisystemic metabolic disorder. Excessive circulating T4 results in clinical signs caused by increased basal metabolic rate and the body's inability to meet that rate.

The majority of feline hyperthyroidism cases are caused by benign adenomatous hyperplasia. Thyroid carcinomas account for only 1%–2% of all cases.[11]

Screening for Hyperthyroidism

According to the American Association of Feline Practitioners' Senior Care Guidelines[11], 40% of hyperthyroid cats have mild clinical signs and can be diagnosed with hyperthyroid disease 1–2 years before obvious signs are noted. In addition, many hyperthyroid cats do not have palpable nodules. Therefore, a screening protocol should be instituted by the time the patient reaches 7 years old as routine.

Monitoring Treatment

Four common treatment options for feline hyperthyroidism are available: treatment with radioactive iodine, medical management with methimazole or carbimazole, surgical thyroidectomy and dietary therapy using an iodine-restricted food*

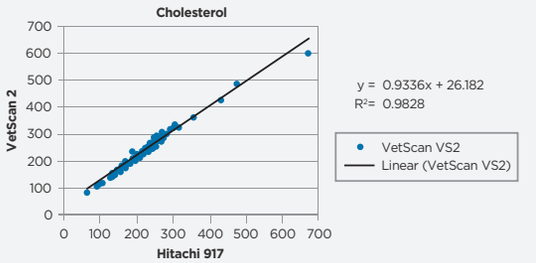
All cats with hyperthyroidism should be monitored, both to control the disease effectively and to avoid iatrogenic hypothyroidism. Close monitoring of hyperthyroid cats as they become regulated will allow for recognition of comorbidities and exacerbation or improvement of already identified concurrent disease. Regardless of the treatment method, evaluation of multiple parameters when monitoring newly diagnosed and treated hyperthyroid cats will optimise the cat's healthcare.*

Monitoring of blood pressure is also relevant in these patients along with renal function which can be checked and monitored using the Kidney Profile Plus or the Comprehensive Diagnostic Profile.

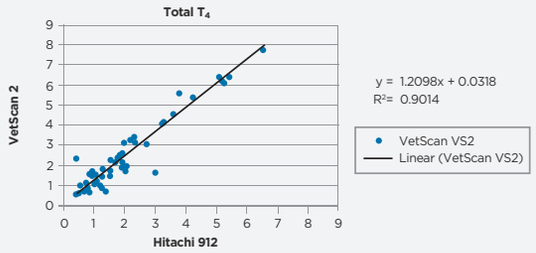
Ref *2016 AAFP Guidelines for the Management of Feline Hyperthyroidism

Accuracy

Cholesterol



Total T4



Conclusion

The study by the University of California, Davis, School of Veterinary Medicine Department of Pathology, Microbiology and Immunology shows that the VETSCAN Total T4 and Cholesterol assays show excellent statistical agreement with the university method. The study shows the VETSCAN VS2 to be an excellent point-of-care analyser for evaluation of total T4 and cholesterol in dogs and cats.[13]

VETSCAN VS2

Phenobarbital Profile

Ideal For

Cost effective evaluation of the phenobarbital (PHB) level with additional liver values all in one panel.

Used For

- Provides comprehensive evaluation of PHB level and screening for potential hepatotoxicity sometimes due to seizure control medications
- Evaluate the patient receiving PHB medication to determine a therapeutic dosage
- Allows for immediate monitoring and titration of PHB for in-clinic client discussion and improved client compliance

Parameters

ALB | ALP | ALT | AST | BUN | GGT | **PHB** | TBIL

Profile Utilisation

Seizure disorders are the most common neurological condition noted in small animal practice and Phenobarbital often serves as a first line medication[14] due to efficacy, availability, cost, dosing convenience, and safety when dosed and monitored appropriately.[15] Therefore, utilisation of a profile that evaluates both PHB and liver values simultaneously allows proper clinical diagnostic monitoring of phenobarbital level so that it can be a safe and efficacious anti-seizure medication.

Phenobarbital (PHB)

Monitoring the level of phenobarbital is essential to achieve maximal seizure control while avoiding harmful side effects. Overdosing can potentially lead to liver damage[16], so it is crucial to carefully dose phenobarbital and closely monitor phenobarbital levels to ensure a safe and effective treatment.

It's important to keep in mind hepatotoxicity is usually avoided, in an otherwise healthy patient, when dosed within the therapeutic range.[17]

VETSCAN VS2

Mammalian Liver Profile

Ideal For

Obtaining baseline liver values, diagnosis and monitoring of hepatic disease and monitoring hepatic function while administering potentially hepatotoxic medications.

Used For

- Diagnosis of liver disease
- Monitoring liver disease
- Diagnosis of congenital and acquired portosystemic shunts
- Obtaining baseline values prior to administration of potentially hepatotoxic medication
- Monitoring patients concurrent with the use of potentially hepatotoxic medications

Parameters

ALB | ALP | ALT | BA | BUN | CHOL | GGT | TBIL

Profile Utilisation

Hepatic disease is frequently a diagnostic challenge. The utiliation of easy-to-use, in-house testing that includes bile acids helps to overcome with this challenge. Additionally, utilisation of the Mammalian Liver Profile in the veterinary practice enhances patient care, improves veterinary diagnostics and provides additional practice revenue.

Hepatic Disease

- The liver is especiallysensitive to effects of many diseases because:
  - › The liver has two blood supplies:
    1. The general circulation
    2. Via the portal vein from the intestine
  - › The general function of the liver and its complex functionality
- Changes in hepatic enzymes can be caused by pathology of the liver from secondary effects of other disease states
- Some of the enzymes that measure liver function (e.g. ALP) can be induced by medications (e.g. phenobarbital) or are naturally elevated in young animals.[18]
- The Mammalian Liver Profile is the only profile to include bile acid testing

Diagnosis of Hepatic Disease Utilising Bile Acids

Diagnosis of any condition requires a combination of history evaluation, physical examination, complete blood counts, chemistry, urinalysis and imaging, to name a few. However, when liver disease is indicated due to elevations in common liver enzymes, diagnosis of liver disease vs. secondary hepatic changes is vital in determining the need for additional diagnostics such as ultrasound and/or biopsy and interpretation of those results and prognosis. Bile acid evaluation provides the veterinarian with a highly sensitive test for liver disease and portosystemic shunts. It is easy to perform and a cost-effective method to aid in evaluating liver health.

Bile Acids

Bile acids are a family of detergent-like compounds synthesized from cholesterol exclusively within the liver. They provide intestinal fat digestion and absorption. In addition, they are efficiently reabsorbed into the portal blood and returned to the liver via the portal vein.[18]

Bile acids elevate in the general circulation due to:

- Decreased bile acid clearance from portal blood
  - › Hepatocyte damage reduces functional hepatic mass causing impaired clearance
  - › Congenital and acquired portosystemic shunts or portosystemic vascular anomalies
- Decreased biliary excretion of bile acids
  - › Impaired hepatic or post-hepatic bile flow due to any cause

Us e of Bile Acids to Assist with Diagnosis of Hepatic Disease — General Rules of Interpretation

Bile acid levels should always be evaluated in light of other hepatic parameters.[18]

Normal/mildly elevated preprandial BA	Liver function may be normal
Very elevated preprandial BA	Indicative of significant liver dysfunction, congenital or acquired portosystemic shunting
Normal preprandial BA and very elevated postprandial BA	Indicative of more subtle cases of liver dysfunction or porto-systemic shunting
Very elevated pre- and postprandial BA, with minimal rise in BA after feeding	Indicative of possible post-hepatic biliary obstruction or biliary stasis
Preprandial BA higher than postprandial	In normal patients, may result from spontaneous interdigestive gallbladder contraction during fasting

Cost Savings

Because of the low cost of the Mammalian Liver Profile, paired bile acid testing is less expensive to perform in the office than sending it out to a commercial lab. Tests can be performed immediately upon suspicion of hepatic disease.

Monitoring the Effects of Potentially Hepatotoxic Medications and/or Chronic Liver Disease

Simple evaluation of routine enzymes, such as ALT and ALP, may not provide complete information as to the health of the liver. For example, many medications (e.g., prednisone) will induce liver enzymes without the presence of actual liver disease. In the case of chronic liver disease or monitoring response to therapy, monitoring the entire spectrum of values associated with the liver provides far better information than any individual test can provide. In addition, each enzyme or parameter may have a different half-life, rate of production or rate of excretion so that monitoring all of the values provides a more complete picture of the patient.

Monitoring of the effects of any long term medication can be easily evaluated using the Mammalian Liver Profile. Common medications such as NSAIDs have potential hepatic or renal toxicities. Therefore, regular monitoring of the patient is vital. This monitoring is more effectively performed with a panel designed to evaluate the relevant body system(s). The Mammalian Liver Profile was designed for this purpose. In addition, the Mammalian Liver Profile provides all the values at a cost to the clinician far lower per test than any other system available.

Recommendations for chronic liver disease or response to therapy will vary with each condition and the half-life of the parameters involved. However, bile acid evaluation can be performed at any time to evaluate liver function.[18]

VETSCAN VS2

Equine Profile Plus

Ideal For

Routine equine checkups, wellness testing, sick patient diagnostics and prepurchase examinations for equine hospitals, ambulatory practitioners, critical care units and mixed animal hospitals.

Used For

- Patient monitoring
- Wellness examinations
- Recheck examinations
- Prepurchase examinations
- sick patient diagnostics
- Fluid therapy

Parameters

ALB	AST	BUN	Ca	CK	CRE	GLU
GGT	GLOB	K^+	Na^+	TBIL	tCO_2	TP

Profile Utilisation

The Equine Profile Plus profile is designed to provide the equine practitioner with comprehensive point-of-care chemistry results in minutes. When time is of the essence, the information provided by the profile enhances patient care especially in critical case management. The ease of use and utility of the Equine Profile Plus not only allows the practitioner to diagnose the sick patient, but provides baseline data, which leads to improved medical management while incorporating a comprehensive health plan for each patient. Competitive pricing of the Equine Profile Plus and its rapid turnaround time adds value to clinical laboratory results, making the services more attractive to an increasingly knowledgeable clientele. Rapid turnaround equates to prompt, more defined treatment for your patients, which clients now demand.

The Equine Patient

The Equine Profile Plus is designed to provide the veterinarian with a profile of vital tests (ALB, AST, BUN, Ca, CK, CRE, GLU, GGT, GLOB, K^+, Na^+, TBIL, tCO_2 and TP) to evaluate the equine patient. This information is critical in patient monitoring especially when fluid therapy is used. This data is useful in many aspects of equine practice in addition to diagnosis and management of the sick patient. The Equine Profile Plus is ideal for use in routine medical examinations, initial assessment of health in neonatal foals, prepurchase examinations, and geriatric case management.

Presurgical Profiling

Presurgical evaluation is beneficial for both patient and client. Additionally, clients are highly inclined to accept the recommendation for this testing when adequately educated. The risk of complication from anesthesia is significantly increased if the patient has underlying renal impairment, hepatic dysfunction or other undisclosed health issues.[19] Presurgical screening provides multiple benefits, which include:

- Identification of metabolic alterations that should be managed prior to surgical intervention
- Identification of subclinical disease that can compromise a positive outcome and can also be addressed to extend both length and quality of life
- Identification of organ dysfunction so that a safe anesthetic protocol can be determined
- Identification of the healthy patient so that the veterinary team may proceed with anesthesia with a higher degree of confidence

Measuring Response to Therapy

Once conditions are diagnosed and therapy begins, it is always prudent to assess response to therapy. While an important goal would be to see abnormal parameters return to normal, it is equally important to assure that other parameters remain normal. Renal dysfunction, hepatic compromise, muscle necrosis, and other complications can result from the use of certain therapeutics. Therefore, while only one parameter may be the focus of attention, best medical practice dictates evaluation of the entire patient and so the other parameters should never be discounted. Once normal levels are achieved, a follow-up evaluation can be performed to ensure wellness is maintained.

Chronic Use of NSAIDs

The chronic use of NSAIDs makes periodic blood chemistry evaluations of kidney and liver functions prudent.[20] Use of long-term medications that may induce organ dysfunction should be evaluated on a regular basis and often serves as the basis for evaluating and continuing the drug.

The VETSCAN VS2 and Equine Profile Plus are the best instrument/chemistry profile to fulfill all the needs of the equine practitioner. The benefits of a full profile with speed and accuracy make it indispensable in any practice that wants to maximize its quality of care for their patients. With its small footprint and rugged stability, the VS2 would be a welcome addition whether in your clinic or tolerating the rigors of a mobile practice.

VETSCAN VS2

Avian/Reptilian Profile Plus

Ideal For

Measuring parameters that represent the most important areas of concern in avian and reptilian patients.

Used For

- Evaluation of renal function, electrolyte status and liver integrity and function
- Wellness testing
- Annual health profiling
- Pre- or postpurchase exams
- Pre-anesthetic evaluation
- Measuring response to therapy
- Emergency cases:
  - › Triage of clinically ill or injured patients
  - › Evaluation of liver integrity and function
  - › Sick patient diagnostics
  - › Evaluation of renal status and electrolyte status
- Long-term monitoring after recovery and discharge

Parameters

ALB | AST | BA | Ca | CK | GLOB | GLU | K^+ | Na^+ | PHOS | TP | UA

Profile Utilisation

Utilisation of the Avian/Reptilian Profile Plus in the veterinary practice will enhance patient care, improve veterinary diagnostics and provide additional practice revenue. Pet birds and reptiles are notorious for hiding signs of sickness and will often do so until they reach a critical stage in which they can no longer compensate or mask those symptoms. The ease of use and utility of the Avian/Reptilian Profile Plus not only allows the clinician to diagnose the sick patient and screen for disease, but to incorporate a comprehensive health plan into the practice for every patient.

The Avian/Reptilian Profile Plus is designed to provide the clinician with a complete profile of vital tests to evaluate the patient. Values such as AST, BA, Ca, CK, GLU and UA are indispensable in the avian practice. This profile offers the necessary parameters to gain an overview of the animal's health while providing focus on specific organ functions.

Sample Size

A sample size of 100 µL of whole blood, serum or plasma is required for a complete chemistry panel. This fact makes the Avian/Reptilian Profile Plus invaluable in avian and reptilian diagnostics. In many patients, only an extremely small blood volume is available from which all the necessary data must be obtained. The common parakeet, for example, can only provide approximately 300 µL of whole blood for which all diagnostic needs must be satisfied.

Utilisation of the Avian/Reptilian Profile Plus

Pre- or Postpurchase Exams

Pre- or postpurchase exams should always include a complete blood panel profile in addition to a physical examination and complete history evaluation. Reasons for including blood work within your purchase exam requirements are:

- Both juvenile and adult birds will hide signs of sickness
- Novice bird owners are less likely to notice these telltale signs of sickness
- Signs of illness may be mistakenly identified as "normal baby behavior" in baby birds
- Assisting the pet retailer to qualify the health of the animals
- Postpurchase profiling accomplishes the following:
  - › Ensuring that the new owner has acquired a healthy pet
  - › Serves as a barometer of the health of the animals coming from a particular store
  - › Establishes a healthy baseline for the new patient

Unhealthy or sick patients can be indentified early and the patient, pet owner and retailer benefit. Blood testing, in addition to a full and complete physical examination, provides the veterinarian with the complete picture of the patient's health.

Annual Health Screening

Pet birds are notorious for hiding signs of illness. In many cases, by the time illness is demonstrated, the patient is in an advanced state of deterioration. Many conditions, especially those that are non-infectious, may take years to reach a critical degree. The value of annual health profiling is that these conditions can often be diagnosed long before signs are exhibited, and well before the condition has become irreversible. The Avian/Reptilian Profile Plus is the only panel available that includes bile acids, maximising the value of the annual exam by omitting no important parameters needed for a complete evaluation.

Presurgical Profiling

The risk of complication from anesthesia is significantly increased if the patient has underlying renal impairment, hepatic dysfunction or other undisclosed health issues.[21] Presurgical screening provides multiple benefits, which include:

- Identification of subclinical disease that can compromise a positive outcome
- Identification of organ dysfunction so that a safe anesthetic protocol can be determined
- Identification of the healthy patient so that the veterinary team may proceed with anesthesia with a higher degree of confidence

Triage of Clinically Ill and Injured Patients

When an avian patient is presented in a compromised state of health and its condition must be assessed, time is of the essence. Sick birds are often near death, and data must be obtained immediately in order to render definitive therapy. While the urgency of obtaining diagnostic data in injured patients depends on the extent of the injuries, the data still must be complete and promptly obtained.

Common subclinical conditions, often lead to complications following injury or surgery. The Avian/Reptilian Profile Plus provides the necessary information to properly assess and diagnose these patients.

VETSCAN VS2

Avian/Reptilian Profile Plus

Monitoring Response to Therapy

Once conditions are diagnosed and therapy begins, it is always prudent to assess response to therapy. While an important goal would be to see abnormal parameters return to normal, it is equally important to assure that other parameters remain normal. Renal dysfunction, hepatic compromise, muscle necrosis and other complications can result from the use of certain therapeutics. Therefore, while only one parameter may be the focus of attention, the other parameters should never be discounted.

Long-Term Monitoring for Recovery and Discharge

Once stability is achieved, it is wise to perform follow-up profiling to ensure wellness is maintained. Many avian disorders are the result of unstable conditions or predisposing factors. Therefore, long-term monitoring is vital to ensure continued health and verify proper husbandry practices.

Improved Profits Due to Enhanced Medical Care

The VETSCAN VS2 is the best instrument to fulfill all the needs of the avian practitioner. The benefits of full profiles with an extremely small sample volume, speed and accuracy make it indispensable in any practice that wants to maximise its quality of care for avian patients. Additionally, the menu provided by the Avian/Reptilian Profile Plus makes it impossible to perform the same spectrum of tests as economically with any other methodology. Because the profile is the least expensive method of obtaining a complete avian profile, and because of the low processing time and sample requirements, it can be used in any number of clinical situations, thereby maximising the ability to turn avian medicine into a significant profit center.

VETSCAN VS2

Large Animal Profile

Ideal For

Herd health assessment and monitoring, prognostic indicator and diagnostic tool for beef and dairy cattle.

Used For

- Gathering baselines and maintaining health of both individual large animal patients and herds
- Monitor management of herd health
- Accurate diagnosis and prognosis as an aid in disease management
- Isolation evaluation and monitoring
- Presurgical evaluations
- Prepurchase exams

Parameters

ALB	ALP	AST	BUN	Ca	CK
GGT	GLOB	Mg	PHOS	TP	

Profile Utilisation

Production Animal Medicine

The Large Animal Profile is not only for individual large animal patients.
More value is being placed on the outcome of management practices intended to improve production and efficiency. Managing a herd and their health is critical given the importance of maintaining herd health for market and protecting the value while limiting costs to manage such a large investment. Additionally, more attention is being given to assure health and safety to the consumer.

With the Large Animal Profile, it is convenient and simple to obtain a herd assessment on a routine basis at the point of care. By evaluating a representative sampling of the herd, it is possible to identify problems before any physical signs are shown—allowing corrective action to be taken immediately. Additionally, sick animals can be evaluated and returned to the herd with peace of mind that the animal is truly recovered.

Herd Health Management

Herd health management practices can be measured and evaluated through the use of regular screening protocols to assure desired results or to implement modifications before poor performance or clinical signs arise.
The availability of a complete chemistry profile at a low cost as well as the ability to obtain results on site during farm visits provides an excellent method to include chemistry profiles as part of the management plan.

Sick Patient Diagnostics

The ability to diagnose and determine treatment possibilities and value is enhanced by the point-of-care benefits and low cost of the Large Animal Profile. Metabolic diseases can be immediately diagnosed such that a reasonable prognosis and action plan can be discussed with the owner or manager immediately. This leads to improved medical care, reduced cost and improved customer relationships and retention.

Improved Profits Due to Enhanced Medical Utilisation

The VETSCAN VS2 is the best instrument to fulfill all the needs of the large animal practitioner. The benefits of testing a full chemistry profile on site, in less than 12 minutes with the accuracy of a reference laboratory, make it indispensable in any mobile unit or practice that wants to maximise its quality of care. With its small footprint, reliability and rugged stability, the VS2 would be a welcome addition whether in your clinic or tolerating the rigors of a mobile practice.

Individual Large Animal Medicine

The Large Animal Profile is designed to provide a profile of vital tests to evaluate the patient. Accurate and timely TP, ALB, GLOB, ALP, AST, CK, GGT, BUN, Mg, and PHOS results provide vital information for livestock herd and patients to enhance patient care, improve diagnostics and provide additional practice revenue with the common large animal species.

This is especially important in large animal or mixed animal practices where the individual patient is often considered valuable. With the increasing value of a particular large animal patient, clients are more inclined to pursue diagnostics and treat the individual animal with any needs necessary to ensure health. The ease of use and utility of the Large Animal Profile not only allows the practitioner to diagnose the sick patient and screen for metabolic disease, but to incorporate a comprehensive health plan into the practice for each patient. Competitive pricing of the Large Animal Profile and its rapid turnaround time adds value to lab results, making the services more attractive to an increasingly knowledgeable client base. Rapid turn-around equates to prompt, more defined treatment, which clients are demanding.

Presurgical Profiling

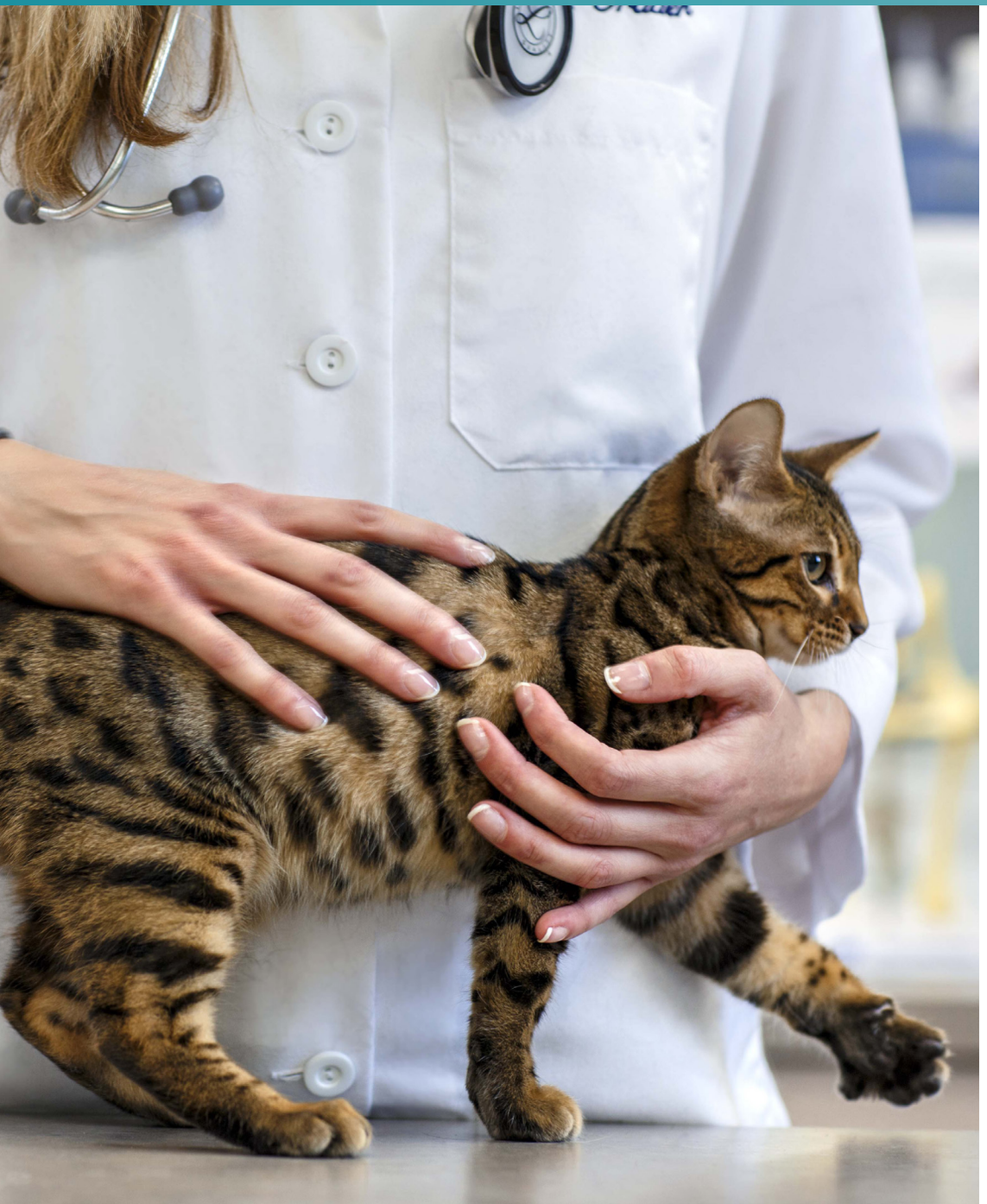
Surgical procedures requiring general anesthesia or profound sedation risk complication if the patient has underlying renal impairment, hepatic dysfunction or other underlying health issues.[8] Presurgical evaluation of these patients is always useful and clients accept the recommendation for this testing when adequately informed of its value. The risk of complication from anesthesia is significantly increased if the patient has underlying renal impairment, hepatic dysfunction or other undisclosed health issues. Presurgical screening provides multiple benefits, which include:

- Identification of metabolic conditions that should be managed prior to surgical intervention
- Identification of subclinical disease that can compromise a positive outcome and can be addressed to extend both length and quality of life
- Identification of organ dysfunction so that a safe anesthetic protocol can be determined
- Identification of the healthy patient so that the veterinary team may proceed with anesthesia with a higher degree of confidence

Measuring Response to Therapy

Once conditions are diagnosed and corrective actions taken, it is important to assess the clinical response. While the goal is to see abnormal parameters return to normal, it is equally important to assure other parameters remain normal. Unintended metabolic complications or organ dysfunction can result from the implementation of corrective measures. Therefore, while only one abnormality may be the focus of the remedial action, best medical practices dictate evaluation of the entire patient, and monitoring of other parameters should never be discounted. Once stability is achieved, follow-up profiling helps ensure the intended outcome is maintained be it for an individual animal or a herd.

Parameter Glossary



ALB	Albumin
ALP	Alkaline Phosphatase
ALT	Alanine Aminotransferase
AMY	Amylase
AST	Aspartate Aminotransferase
BA	Bile Acid
BUN	Blood Urea Nitrogen
Ca	Calcium
CHOL	Total Cholesterol
CK	Creatine Kinase
Cl^-	Chloride
CRE	Creatinine
GGT	Gamma-Glutamyl-Transferase
GLOB*	Globulin
GLU	Glucose
K^+	Potassium
Mg	Magnesium
Na^+	Sodium
PHB	Phenobarbital
PHOS	Phosphorus
T4	Thyroxine
TBIL	Total Bilirubin
tCO_2	Total Carbon Dioxide
TP	Total Protein
UA	Uric Acid

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