Mammalian Liver Profile

Analytes

ALB, ALP, ALT, BA, BUN, CHOL, GGT and TBIL

Ideal For

Obtaining baseline liver values, diagnosis and monitoring of hepatic disease and monitoring hepatic function while administering nonsteroidal anti-inflammatory drugs (NSAIDs) or other 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 NSAIDs
- Monitoring patients concurrent with the use of NSAIDs and other potentially hepatotoxic medications

Rotor Utilization

Hepatic disease is frequently a diagnostic challenge. The utilization of easy-to-use, in-office testing that includes bile acids assists with this challenge. Additionally, utilization 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 especially prone to the adverse effects of many diseases because:
  - The liver has two blood supplies:
    - The general circulation
    - Via the portal vein from the intestine
  - The general function of the liver and its complex functionality also place it at risk
- Changes in hepatic enzymes can be caused by pathology of the liver from secondary effects of other disease states
- Some of the enzymes used to evaluate liver function (e.g., ALP) can be induced by medications (phenobarbital) or nonhepatic disease states (hyperadrenocorticism). These tests do not provide evaluation of liver function; however, bile acid testing, included in the MLP, provides this ability

Diagnosis of Hepatic Disease Utilizing 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.

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

Utilization 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 analytes.

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 portosystemic 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 analyte 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. In fact, most medications make at least one pass through the liver, where they may or may not be altered. 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 medications:
- Perform a Comprehensive Diagnostic Profile and CBC at institution of drug therapy
  - Provides baseline levels of whole body function
- Perform a Mammalian Liver Profile plus CBC at 7–14 days post drug administration
- Perform an MLP/CBC every 3–4 months with a yearly CDP/CBC, to monitor the patient's health status

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