



## Bile Acids (Blood, Urinary)

### BASIC INFORMATION



#### DEFINITION

Family of detergent-like compounds (predominately cholic acid and chenodeoxycholic acid in animals) synthesized in the liver from cholesterol and secreted in bile to aid in digestion and absorption of fat and fat-soluble vitamins.

#### TYPICAL NORMAL RANGE

- Fasting bile acids normally  $<5 \mu\text{mol/L}$ .
- Fasting bile acids  $>20 \mu\text{mol/L}$ , postprandial samples  $>25 \mu\text{mol/L}$ , and urine bile acid/creatinine  $>7.1$  indicate liver disease.

#### PHYSIOLOGY

Stored in the gall bladder. Released as a bolus into the small intestines upon feeding. An efficient enterohepatic circulation exists when up to 95% of bile acids are recycled. Serum bile acids are evaluated in paired samples (fasting, postprandial). Urinary bile acid: creatinine ratios reflect

an average serum bile acid concentration and only a single sample is required.

**CAUSES OF ABNORMALLY HIGH LEVELS:** Cholestasis, liver disease, portosystemic shunt

**NEXT DIAGNOSTIC STEP TO CONSIDER IF LEVELS HIGH:** Assess for cholestasis (bilirubin, alkaline phosphatase), portosystemic shunt (imaging), other liver diseases (alanine aminotransferase, imaging, liver biopsy).

**LAB ARTIFACTS THAT MAY INTERFERE WITH READINGS OF LEVELS OF THIS SUBSTANCE**

- Decrease: hemolysis, lipemia (spectrophotometric method), no effect on radioimmunoassay.
- Increase: hypertriglyceridemia (spectrophotometric method), no effect on radioimmunoassay.

**SAMPLE FOR COLLECTION AND ANY SPECIAL SPECIMEN HANDLING NOTES**

- Serum: 12-hour fasting sample and 2-hour postprandial sample recommended.

Separate serum from red blood cells as soon as possible. Store at  $2-8^{\circ}\text{C}$  (refrigeration).

- Urine: fresh urine, avoid blood contamination.

#### PEARLS

- If cholestasis is present (e.g., patient is icteric without evidence of hemolysis), bile acids do not provide any additional information on hepatic function. Bile acids are a good indicator of hepatobiliary function, but are not specific for the type of underlying disease. Extrahepatic diseases can elevate bile acid concentrations. Urine bile acids are more specific for canine liver dysfunction than serum bile acids.
- Occasional preprandial values that exceed postprandial values are attributed to spontaneous gall bladder contraction.

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SAMPLE PAGES

SAMPLE PAGES

LABORATORY TESTS



ELSEVIER

