INCREASED LIVER ENZYMES IN DOGS: ALT

INCREASED ALANINE AMINOTRANSFERASE (ALT)*

INVESTIGATION
Rule out hepatotoxin or drug**

DISCONTINUE; TREAT FOR HEPATOTOXICITY

INVESTIGATION
Clinical abnormalities?

NO

TREATMENT
Antioxidant (± antibiotic) trial (ie, empiric therapy for cholangiohepatitis)

INVESTIGATION
Recheck ALT in 4-6 weeks

NORMAL

INVESTIGATION
Persistent or progressive ALT increase

INVESTIGATION
CBC, serum chemistry panel, urinalysis

INVESTIGATION
Evaluate for extrahepatic causes, if suggested by routine diagnostics

NO EVIDENCE OF EXTRAHEPATIC DISEASE

YES

INVESTIGATION
Weight loss, vomiting, diarrhea, decreased appetite

INVESTIGATION
Signs of muscle disease

INVESTIGATION
Check AST and creatine kinase
Electromyogram
Toxoplasma spp, Neospora spp titers
Pyruvate and lactate levels
Muscle biopsy

* Any increase in ALT should be rechecked at least once to rule out a spurious result or laboratory error, particularly if the patient is subclinical. More aggressive evaluation should be considered in breeds predisposed to hepatic disease: Bedlington terriers, West Highland white terriers, Labrador retrievers, standard poodles, cocker spaniels, English springer spaniels, Doberman pinschers, dalmatians, and Skye terriers.

** Acetaminophen, azathioprine, hepatotoxic mushrooms, CCNU, blue-green algae, xylitol, cycad palm, aflatoxin.
DIAGNOSTIC TREE

HEPATOBLIARY DISEASE

PEER REVIEWED

DIFFERENTIAL
Regenerative hyperplasia

DIFFERENTIAL
Reactive hepatopathy

DIFFERENTIAL
Hepatic neoplasia

DIFFERENTIAL
Hepatic neoplasia

DIFFERENTIAL
Chronic hepatitis

DIFFERENTIAL
Cholangiohepatitis

DIFFERENTIAL
Other disease (eg, inflammatory bowel disease, pancreatitis)

DIFFERENTIAL
Idiopathic vacuolar hepatopathy

DIFFERENTIAL
Idiopathic vacuolar hepatopathy

DIFFERENTIAL
Portosystemic shunt, portal vein hypoplasia

DIFFERENTIAL
Biliary disease (ALP>ALT, eg, mucocele)

INVESTIGATION
Recheck ALT in 4-6 weeks

INVESTIGATION
Recheck after 1 year of age

INVESTIGATION
Administer empiric dewormer; recheck after 4-6 weeks

INVESTIGATION
Abdominal ultrasound

INVESTIGATION
Fasting and 2-hour post-prandial bile acids

INVESTIGATION
Recheck after 1 year of age

INVESTIGATION
Administer empiric dewormer; recheck after 4-6 weeks

INVESTIGATION
Recheck ALT in 4-6 weeks

NORMAL

SBA

ABNORMAL

SBA

<1 YEAR OF AGE

>1 YEAR OF AGE

NORMAL

PERSISTENT OR PROGRESSIVE ALT INCREASE

ALP = alkaline phosphatase
ALT = alanine aminotransferase
AST = aspartate transaminase
HAC = hyperadrenocorticism
SBA = serum bile acids

See page 108 for suggested reading.