



# YOUR PET HAS AN ELEVATED ALP

## **Elevated ALP**

The abbreviation “ALP” stands for alkaline phosphatase, which is an enzyme many routine blood panels may measure. Primarily, the liver produces ALP, though there are other minor sources too such as from the bone and in response to steroids. The liver itself is an important organ that removes toxins from the blood, helps produce blood sugar and other blood proteins and bile, which is stored in the gall bladder and aids in digestion.

## **Liver Values**

The values related to the liver on a chemistry panel include ALP, ALT, GGT, and total bilirubin. The liver also makes glucose, cholesterol, albumin, and BUN. These levels can give clues to how well the liver is functioning. ALT, or alanine transferase, is what is known as a “hepatocellular” liver enzyme. When the cells of the liver are damaged, this enzyme leaks out into the blood. Elevated ALT is often more worrisome than high ALP to veterinarians since it indicates ongoing damage to the liver cells. ALP and GGT are what are known as “cholestatic” enzymes. This means that elevations predominantly occur if there are issues with the flow of bile, either within the liver, or as it leaves the gallbladder.

## **What causes high ALP?**

Elevated ALP is one of the most common lab work abnormalities in older dogs (less common in older cats). An elevated ALP is very sensitive in assessing liver or gall bladder disease in dogs and cats, but it is also a non-specific finding. This means that lots of other conditions aside from liver disease can cause an elevation in ALP. The list of conditions that can cause an elevated ALP is long and includes liver and/or gallbladder diseases such as bacterial or viral infections, benign nodular hyperplasia, vacuolar hepatopathy, cancers, certain genetic diseases, gallstones, gallbladder infections. Other medical conditions not directly related to the liver can also cause elevations in ALP such as diabetes, hypothyroidism, Cushing’s disease, pancreatitis, gastroenteritis and non-liver specific cancers like lymphoma or osteosarcoma. There are toxins that can also cause substantial liver damage such as xylitol toxicity, Zinc, Aflatoxins, blue green algae, and certain mushrooms. Lastly, some medications, such as steroids (prednisone) and phenobarbital for seizures can also cause elevations in the liver values.

## **Is a higher ALP worse for dogs?**

No, this is not always the case. Some benign and completely reversible issues, like high doses of steroids can cause severe elevations in ALP. However, if there is not an obvious reason for the elevation, the severity of the elevation is often used to help decide how aggressive to be with additional diagnostic testing.

## What are the next steps for a pet with an elevated ALP?

Your veterinarian will start with a detailed medical history and physical exam. Every case is different, but often full blood work, if not already performed, will be the first step. If no other concerning changes are detected, and your pet is feeling well, sometimes your veterinarian will elect a “watchful waiting” approach to monitor the values. If the ALP improves or remains the same, the monitoring approach may continue. If elevation gets worse, other abnormalities are detected on repeat lab work or any new symptoms develop, then additional testing will likely be recommended.

## NEXT STEPS:

**Liver function testing:** Bile acid testing helps determine if liver function is still normal. It is another non-invasive blood test that is performed at the hospital after a 12 hour fast. If the bile acids are elevated, it can indicate reduced liver function, but it still does not determine the underlying cause of the liver problem.

**Imaging:** X-rays and ultrasound are the two most common types of imaging. X-rays have a limited ability to evaluate the liver and ultrasound is much more useful in most cases. An ultrasound can evaluate for masses or nodules in the liver, assess the gallbladder for signs of infection, stones or a mucocele or help determine if there may be other medical conditions like pancreatitis or Cushing’s disease. One limitation to ultrasound is that while it can determine if the liver looks abnormal, it cannot definitively pinpoint the underlying cause of masses, nodules, or other abnormalities. Some nodules are benign changes, while others represent cancer.

**Liver Sampling:** If any nodules, masses, or other liver abnormalities are found, we will often recommend obtaining a liver sample to send to the lab. This can sometimes be done at the time of the ultrasound with a technique called a Fine Needle Aspirate, or a surgical or laparoscopic biopsy may be recommended instead. A liver biopsy is the most definitive way to determine the underlying cause of liver enzyme elevations. However, it is more invasive than many of the other tests.

In conclusion, if your pet’s blood work showed an elevated ALP value, the best thing you can do is learn what your options are. Sometime being presented with all the different diagnostic options can feel a bit overwhelming. But at the end of the day, you and your trusted vet should be able to work together to create a plan for your dog—be it a “watchful waiting” approach or further diagnostics—that you feel confident about.