

Detects Liver Disease in Humans, Coming Soon for Pets

Your pet's liver is a hardworking machine, and if it isn't functioning properly, it can seriously affect your dog's health, longevity and quality of life. To assess your dog's liver health now, they must go through an invasive and costly biopsy procedure. That's about to change soon.

Analysis by Dr. Karen Shaw Becker

STORY AT-A-GLANCE

- In humans, liver disease can be detected via a simple blood test looking for microRNA-122 (miR-122), a molecule that's high in those with liver disease
- Dogs with liver disease also have significantly higher levels of miR-122 than other dogs, making it a useful biomarker for the disease in these animals
- Currently, liver disease in dogs is diagnosed via biopsy, an invasive procedure that comes with a risk of serious complications, and not to mention expensive
- The miR-122 blood test could soon present a quick and easy option for pet owners to keep tabs on their pet's liver health

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A blood test used to detect liver disease in humans could soon be available for veterinary patients as well. Currently, liver disease in dogs is diagnosed via biopsy, an invasive procedure that comes with a risk of serious complications, and not to mention expensive.

In humans, however, liver disease can be detected via a simple blood test looking for microRNA-122 (miR-122), a molecule that's high in those with liver disease. Veterinarians at the University of Edinburgh's Royal (Dick) School of Veterinary Studies tested miR-122 levels in 250 dogs, including labradoodles, Old English sheepdogs and cocker spaniels.¹

Some of the dogs were healthy, some had non-liver diseases and 30 of the dogs had confirmed liver disease. It turned out that the dogs with liver disease had significantly higher levels of miR-122 than the other dogs, making it a useful biomarker for the disease in these animals, much like it is in humans.

"We have found a specific, sensitive and non-invasive way to detect liver damage in dogs," lead researcher Richard Mellanby, Ph.D., head of companion animal sciences at The Hospital for Small Animals at the University of Edinburgh, said in a news release. "We hope that our test will greatly improve outcomes by allowing vets to make rapid and accurate diagnosis."²

Signs of Liver Disease in Dogs

The liver is an incredibly important organ that performs numerous functions for your dog, including filtering toxins from the blood, manufacturing proteins needed for a variety of functions, including blood clotting, and storing sugar in the form of glycogen.

Your dog's liver also stores vitamins, produces bile acids for digestion, breaks down drugs and metabolizes energy sources. It even influences immune responses and helps develop blood cells.³ Needless to say, if the liver isn't functioning properly, it can seriously affect your dog's health, longevity and quality of life, leading to any of the following symptoms:⁴

- Jaundice (yellow-tinged eyes, gums or tongue)
- Loss of appetite
- Weight loss
- Increased thirst
- Vomiting or diarrhea
- Seizures
- Disorientation
- Depression
- Personality changes
- Increased urination
- Changes in stool color
- Fluid retention in the abdomen (ascites)

The neurologic problems above, including personality changes and disorientation, can be caused by hepatic encephalopathy, a complication of liver disease that affects the brain. Dogs with poor liver function may develop a number of neurologic symptoms including poor coordination, excessive drooling, inability to respond to basic commands, aimless wandering and behavioral changes.

What Causes Liver Disease?

Liver disease has many causes, including exposure to poisonous substances such as toxic plants, blue-green algae, chronic use of painkillers or exposure to environmental and veterinary pesticides. Liver disease can also have infectious causes, such as infectious hepatitis, toxoplasmosis or leptospirosis.

In the latter case, leptospira bacteria are transmitted through urine that contaminates water sources. Dogs pick up the bacteria through a cut or break in the skin when they come in contact with contaminated water or soil, or when they drink contaminated water from a puddle or pond.

Chronic active hepatitis (CAH) is another condition in which there is persistent and progressive inflammation of the liver, resulting in the disease known as cirrhosis of the liver. Most cases of CAH have no known cause, but the condition is most often seen in middle-aged or older female dogs, and certain breeds are predisposed, including

Bedlington terriers, Doberman pinschers, Skye terriers, standard poodles, cocker spaniels and West Highland white terriers.

Certain endocrine diseases can also affect your dog's liver, including diabetes, Cushing disease and hyperthyroidism, as can untreated heartworms, issues with the pancreas or even the consumption of fatty foods.⁵

Early Detection of Liver Problems Is Important

The liver is a fascinating organ in that it has regenerative powers and the ability to function adequately even when it's "sick." By catching problems early, it's possible to make changes to save your dog's liver function before the problems become irreversible or chronic.

The new miR-122 blood test will present a quick and easy option for pet owners to keep tabs on their pet's liver health, but until it becomes widely available there are some other tests you can try.

The serum chemistry values most commonly measured in pets include ALP (alkaline phosphatase), ALT (alanine transaminase), AST (aspartate transaminase), GGT (gamma glutamyl transferase), bilirubin and albumin. Each of these comes with its own limitations, however, such as ALP, which can be an indicator of liver disease but can also be elevated due to a variety of other causes (ALP is not liver-specific).

An elevated ALT value (without elevation in other markers), on the other hand, may indicate rapid death of, or injury to, liver cells, while elevated AST enzyme may signal problems with the liver or other areas of the body, such as skeletal and cardiac muscles.

Elevated bilirubin, or low albumin, can also be signs of liver disease or failure, and if your pet has any of these blood abnormalities they should be evaluated by your veterinarian immediately, especially if your dog is having symptoms. Unfortunately, you can't rely on a single ALT, GGT or AST value to arrive at a definitive diagnosis or prognosis. These enzymes reflect liver cell damage, but don't reflect overall liver function, or tell your vet why and how the liver is being damaged.

To assess remaining liver function, a Bile Acids test is necessary. This is often the next diagnostic recommendation made by vets if liver enzymes are elevated, along with a liver ultrasound.

Increased liver enzyme values should be rechecked regularly, along with other markers of liver disease and liver function (bile acids), to get a better picture of what's really going on and discern if the treatment protocol is effectively addressing the liver condition. As mentioned, a definitive diagnosis of liver disease often requires a biopsy, which is why the miR-122 blood test will be such a useful tool for diagnosis going forward.

Tending to Your Pet's Liver Health

Your dog's liver (much like your own) is under a barrage of stress every day due to contaminants in air, water and food, parasites, infectious diseases, unnecessary vaccines and other environmental toxins. Regular liver detoxification support using supplements like milk thistle, SAME, Phosphatidyl choline, NAC (N-acetyl cysteine) or SOD (superoxide dismutase) can give your pet's liver the extra support it needs to stay healthy.

This may be especially important if mildly elevated liver enzymes are identified on routine bloodwork, and in this case you'll want to recheck them regularly to be sure they improve and do not worsen.

Schisandra fruit, included in many Traditional Chinese Medicine (TCM) formulas, is another option known to help protect the liver against various toxins. Other herbs that assist in liver function and detoxification include burdock root, dandelion root, licorice, Oregon grape root and yellow dock.

If your dog is having symptoms of liver disease, however, you'll want to work with an integrative veterinarian who can help you determine the root cause of the disease and develop the best treatment protocol for the situation, as conventional medicine still has very little to offer chronic liver disease patients, in the way of slowing down disease progression, and most allopathic vets still don't advocate periodic detoxification protocols to reduce liver stress and degeneration from occurring.

Hopefully, the miR-122 blood test will prove to be both effective and accessible worldwide so dogs can get diagnosed more cost-effectively, so a treatment and recovery plan can be created and instituted sooner in the disease process.

Sources and References

¹ [Journal of Veterinary Internal Medicine August 2, 2018](#)

² [The Royal \(Dick\) School of Veterinary Studies, New blood test for liver disease in dogs](#)

³ [Merck Veterinary Manual, Diseases of the Liver and Gallbladder in Dogs](#)

⁴ [PetMD, Liver Disease in Dogs](#)

⁵ [WebMD, Liver Disease in Dogs](#)
