

## BASIC INFORMATION

### Description

Protein-losing enteropathy (PLE) is a term used to describe conditions of the gastrointestinal tract (gut) that cause protein to be lost in the feces. When excessive amounts of protein are lost from the gut, nutrient and caloric intake is inadequate and weight loss occurs. Loss of protein from the body can develop with a wide variety of diseases, many of which must be ruled out before reaching a diagnosis of PLE.

### Causes

Protein loss can occur with inflammation in the gut, such as with inflammatory bowel disease (IBD) and certain infections (viral, fungal, bacterial). Protein may also be lost with bleeding into the gut from ulcers or tumors or from intestinal parasites (especially hookworms, whipworms, and giardiasis in dogs).

More significant and severe protein loss can occur with abnormalities in the vessels that remove lymph (fluid containing white blood cells) from the intestines (a condition called *lymphangiectasia*), with partial obstructions of the small intestines, and with some forms of cancer. Certain dog breeds are at higher risk for the development of PLE from lymphangiectasia, which implies that PLE may be a genetic disorder in some dogs. Examples include the Yorkshire terrier, Maltese, and Norwegian lundehund.

### Clinical Signs

Signs of PLE are often vague and can wax and wane, so an initial suspicion may not arise until preliminary diagnostic tests have been run. Usually dogs with PLE have signs of gastrointestinal disease, such as diarrhea, vomiting and lack of appetite. Animals with severe PLE may develop edema (swelling) of the limbs and skin, difficulty breathing from fluid in the chest, and enlargement of the abdomen from fluid accumulation (ascites). Weight loss is common.

### Diagnostic Tests

PLE is often first suspected when total protein and/or albumin protein content of the blood is found to be low. In more severe cases, globulin protein is also low, and other laboratory abnormalities may be detected. When low proteins are discovered, several fecal tests may be recommended to look for parasites or bleeding in the gastrointestinal tract. In dog breeds that are known to be at risk for PLE, such as the soft-coated wheaten terrier, silky terrier, and Rottweiler, a specialized fecal test can be used to look for protein loss.

Protein loss from other sites must also be ruled out through tests such as a urinalysis and urine protein/creatinine ratio to look for protein loss from the kidneys; x-rays of the chest; x-rays and an ultrasound of the abdomen; and specialized tests of liver function, such as a bile acid test. If the liver is working properly, no protein is being lost in the urine, and no abnormalities are detected in the chest, then the most likely cause of the low protein is PLE.

With more severe disease, particularly if surgery is planned, your veterinarian may recommend tests to assess the blood's ability to clot, because the proteins that control blood clotting tend to be lost along with albumin. Any fluid retrieved from the abdomen and chest may be sent for analysis. Some forms of PLE, particularly lymphangiectasia, are best diagnosed with intestinal biopsies.

## TREATMENT AND FOLLOW-UP

### Treatment Options

The main treatment for PLE from lymphangiectasia is to feed an extremely low-fat diet. Fat in the diet is absorbed through the lymph vessels in the gut, so feeding a low-fat diet decreases the amount of lymph that is made. If other causes of PLE, such as IBD, intestinal tumors, intestinal obstructions, or parasites, are found, treatment is directed toward the primary disease.

If fluid is present in the abdomen or chest, diuretics are often given to help remove the fluid. Large volumes of fluid are sometimes drained from the chest or abdomen with a needle or catheter. Dogs with abnormal blood clotting may be given medications to help reduce the risk of blood clots in large veins or arteries (thrombosis). Plasma transfusions may be used in some cases to replace blood-clotting proteins.

### Follow-up Care

Follow-up visits and repeated testing are usually needed, with their frequency depending on the severity of the protein loss and the presence of complications, such as ascites or blood clotting problems.

### Prognosis

Prognosis for dogs with PLE is variable. If a condition can be identified that is treatable and potentially curable, the prognosis is good. Examples include intestinal parasites, certain infections, and IBD. Dogs with intestinal cancer or lymphangiectasia have a poor or guarded (uncertain) prognosis. Many dogs with persistent PLE eventually die from complications such as thrombosis or severe ascites.