

# Hyperlipidemia

(Presence of Large Amount of Lipids [Cholesterol and Triglycerides] in the Blood)

## Basics

### OVERVIEW

- Increased concentration of lipids (cholesterol and triglycerides) in the blood of a fasted pet (in which food has been withheld for at least 12 hours); includes high levels of cholesterol in the blood (known as “hypercholesterolemia”), high levels of triglyceride in the blood (known as “hypertriglyceridemia”), or both
- “Lipemia”—presence of abnormally large amount of lipids in the circulating blood; serum or plasma separated from blood contains an excess concentration of triglycerides (greater than 200 mg/dL), which gives the serum or plasma a cloudy appearance
- “Lactescence”—opaque, milk-like appearance of serum or plasma that contains an even higher concentration of triglycerides (greater than 1,000 mg/dL) than lipemic serum

### GENETICS

- Genetic predisposition in miniature schnauzer (dog) and Himalayan (cat) for hereditary hyperlipidemia

### SIGNALMENT/DESCRIPTION OF PET

#### Species

- Dogs and cats

#### Breed Predispositions

- Hereditary hyperlipidemia in miniature schnauzer (dog) and Himalayan (cat)
- High levels of cholesterol in the blood for unknown reason (known as “idiopathic hypercholesterolemia”) observed in families of Briard, rough collie, Shetland sheepdog, Doberman pinscher, and Rottweiler
- Idiopathic hyperchylomicronemia in cats—familial, autosomal recessive

#### Mean Age and Range

- Hereditary hyperlipidemia—age of onset is greater than 4 years in predisposed breeds of dog (such as the miniature schnauzer) and greater than 8 months in cats

### SIGNS/OBSERVED CHANGES IN THE PET

- Some pets may have increased concentration of lipids and not show any signs
- Recent ingestion of a meal
- Seizures and other nervous system signs
- Abdominal pain and distress
- Nervous system disorders (known as “neuropathies”)



- Lipemia retinalis (condition in which the blood vessels in the back of the eye [retina] appear pink rather than normal red; pink color is caused by the whitish lipids mixing with the blood)
- Lipemic aqueous (the “aqueous humor” is the transparent liquid that fills the front part of the eyeball; with high levels of triglycerides, the transparent fluid becomes cloudy—”lipemic aqueous”)
- Cutaneous xanthoma (benign nodular lesions in the skin, associated with high levels of lipids [cholesterol and triglycerides])
- Chronic inflammation in organs of the abdomen (known as “lipid granulomas”)

## CAUSES

### Increased Absorption of Triglycerides or Cholesterol

- Post-prandial (following a meal)

### Increased Production of Triglycerides or Cholesterol

- High levels of cholesterol in the blood for unknown cause (condition known as “idiopathic hypercholesterolemia”)
- Nephrotic syndrome (a medical condition in which the pet has protein in its urine, low levels of albumin [a type of protein] and high levels of cholesterol in its blood, and fluid accumulation in the abdomen, chest, and/or under the skin)
- Pregnancy
- Defects in lipid-clearance enzymes or lipid-carrier proteins
- High levels of chylomicrons (lipid droplets containing cholesterol esters and triglycerols) in the blood for unknown cause (condition known as “idiopathic hyperchylomicronemia”)
- High levels of chylomicrons (lipid droplets containing cholesterol esters and triglycerols) in the blood (known as “hyperchylomicronemia”) in cats

### Decreased Clearance or Removal of Triglycerides or Cholesterol

- Low or inadequate levels of thyroid hormone (known as “hypothyroidism”)
- Excess levels of steroids produced by the adrenal glands (known as “hyperadrenocorticism” or “Cushing's syndrome”)
- Diabetes mellitus (“sugar diabetes”)
- Inflammation of the pancreas (known as “pancreatitis”)
- Cholestasis (condition in which the flow of bile is decreased or stopped)

## RISK FACTORS

- Obesity
- High dietary intake of fats
- Genetic predisposition in miniature schnauzer (dog) and Himalayan (cat)
- High levels of cholesterol in the blood for unknown cause (condition known as “idiopathic hypercholesterolemia”) observed in families of Briards, rough collies, Shetland sheepdogs, Doberman pinschers, and Rottweilers

## Treatment

### HEALTH CARE

- Depends on underlying cause

### DIET

- Initial management is dietary
- Diet should contain less than 10% fat (your veterinarian will prescribe a suitable diet, based on the individual patient)

## Medications

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should

not be considered as all inclusive.

- Medications may be tried, if diet fails to control the high levels of lipids (cholesterol and triglyceride) in the blood
- Gemfibrozil
- Fish oils—omega-3 polyunsaturated fat
- Niacin slow release for dogs

## Follow-Up Care

### PATIENT MONITORING

- Keep triglyceride concentrations less than 500 mg/dL to avoid possibly fatal episodes of sudden (acute) inflammation of the pancreas (pancreatitis)
- Checking cholesterol often is not necessary, because high levels of cholesterol in the blood (hypercholesterolemia) are not associated with clinical signs in dogs and cats

### POSSIBLE COMPLICATIONS

- Inflammation of the pancreas (pancreatitis) and seizures are common complications of high levels of lipids in the blood (hyperlipidemia) in the miniature schnauzer
- In cats with hereditary chylomicronemia, xanthoma formation (benign nodular lesions in the skin, associated with high levels of lipids [cholesterol and triglycerides]); lipemia retinalis (condition in which the blood vessels in the back of the eye [retina] appear pink rather than normal red; pink color is caused the whitish lipids mixing with the blood); and nervous-system disorders (neuropathies); nervous-system disorders involving the limbs (known as “peripheral neuropathies”) usually resolve 2–3 months after institution of a low-fat diet

### EXPECTED COURSE AND PROGNOSIS

- Depends on underlying cause

## Key Points

- Increased concentration of lipids (cholesterol and triglycerides) in the blood of a fasted pet (in which food has been withheld for at least 12 hours); includes high levels of cholesterol in the blood (known as “hypercholesterolemia”), high levels of triglycerides in the blood (known as “hypertriglyceridemia”), or both
- Initial management is dietary
- Diet should contain less than 10% fat
- Inflammation of the pancreas (pancreatitis) and seizures are common complications of high levels of lipids in the blood (hyperlipidemia) in the miniature schnauzer