HYPERLIPIDEMIA
(PRESENCE OF LARGE AMOUNT OF LIPIDS [CHOLESTEROL AND TRIGLYCERIDES] IN THE BLOOD)

BASICS

OVERVIEW
- Concentration of lipids (cholesterol and triglycerides) in the blood of a fasted patient (in which food has been withheld for at least 12 hours) that exceeds the upper limit of "normal" for that species, as determined by blood tests; includes both high levels of cholesterol in the blood (known as "hypercholesterolemia") and high levels of triglyceride in the blood (known as "hypertriglyceridemia")
- "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 1000 mg/dL) than lipemic serum

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

SIGNALMENT/DESCRIPTION of ANIMAL

Species
- Dog and cat

Breed Predilections
- Hereditary hyperlipidemias 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 Doberman pinschers and rottweilers

Mean Age and Range
- Hereditary hyperlipidemias—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 ANIMAL
- Recent ingestion of a meal
- Seizures
- 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])

CAUSES

Increased Absorption of Triglycerides or Cholesterol
- Postprandial (following a meal)

Increased Production of Triglycerides or Cholesterol
- Nephrotic syndrome (a medical condition in which the animal 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
- High levels of cholesterol in the blood for unknown cause (condition known as "idiopathic hypercholesterolemia")

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 disease")
- 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 Doberman pinschers and rottweilers

TREATMENT

HEALTH CARE

• Depends on underlying cause

DIET

• Initial management is dietary
• Diet should contain less than 10% fat (for example, Hill's Prescription Diet® r/d®, IAMS® Restricted-Calorie™ Formula)

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—linolenic acid (omega-3 polyunsaturated fat)
• Clofibrate and niacin—not currently recommended in dogs or cats

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
• 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) have been reported in cats with an inherited condition characterized by high levels of chylomicrons (lipid droplets containing cholesterol esters and triglycerols) in the blood (known as "hereditary hyperchylomicronemia"); nervous-system disorders involving the limbs (known as "peripheral neuropathies") usually resolve 2 to 3 months after institution of a low-fat diet

EXPECTED COURSE AND PROGNOSIS

• Depends on underlying cause

KEY POINTS

• Concentration of lipids (cholesterol and triglycerides) in the blood of a fasted patient (in which food has been withheld for at least 12 hours) that exceeds the upper limit of "normal" for that species, as determined by blood tests; includes both high levels of cholesterol in the blood (known as "hypercholesterolemia") and high levels of triglyceride in the blood (known as "hypertriglyceridemia")
• Initial management is dietary
• Diet should contain less than 10% fat (for example, Hill's Prescription Diet® r/d®, IAMS® Restricted-Calorie™ Formula)
• Inflammation of the pancreas (pancreatitis) and seizures are common complications of high levels of lipids in the blood (hyperlipidemia) in the miniature schnauzer