

Low Cholesterol in Cats & Dogs

This week a colleague asked me if I had a favorite biochemical abnormality. I'd never been asked that before, nor had I ever really thought about it. Most who know me as a clinician know I geek out over changes on a complete blood count, the non-invasive blood test that yields important information about red blood cells, white blood cells, and platelets. But changes on a biochemical profile like kidney value changes, liver enzyme elevations, and electrolyte derangements? It took me a minute to come up with my answer: hypocholesterolemia or low cholesterol.



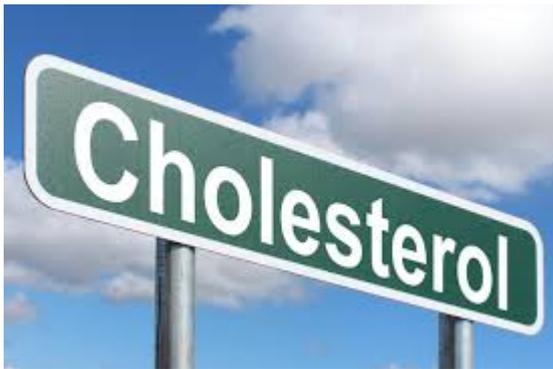
What is cholesterol?

Cholesterol is a type of fat in the body that is needed in the body to make other important compounds, including hormones, vitamin D, and substances that help digest food. Cholesterol comes from two main sources - internal organs (most notably the liver) & diet. Measurement of cholesterol can give an indication of hepatic function, gastrointestinal disease, and metabolic disorders.

Cholesterol occurs in blood as part of all lipoproteins. Lipoproteins are special particles made up of droplets of fats surrounded by a single layer of phospholipid molecules. Phospholipids are molecules of fats that are attached to a phosphorus-containing group. There are several different lipoproteins:

- Chylomicrons (CM)
- Very low density lipoproteins (VLDL)
- Low density lipoproteins (LDL) - the so-called "bad" cholesterol
- Intermediate density lipoproteins (IDL)
- High density lipoproteins (HDL) - the so-called "good" cholesterol

These vary in their origin, triglyceride and cholesterol content, associated proteins, and role. Low density lipoproteins are formed from VLDLs and are responsible for transporting cholesterol to other tissues like the adrenal glands, ovaries, and testes. High density lipoproteins are made in the liver and gastrointestinal tract. They transport cholesterol from tissues to the liver. Studies have shown this process is minimal in dogs compared to humans. Once in the liver, cholesterol is incorporated into VLDLs, synthesized into bile acids, modified into specific types of fatty acids or excreted into the bile.



Why I like finding low cholesterol...

The patients I encounter on a daily basis have complicated medical problems. After all, that's why they were referred to me. So, it shouldn't surprise anybody when I make this next statement: I like things simple. Straightforward abnormalities are a welcomed respite from the complicated world of internal medicine. Low cholesterol is often just that - straightforward. Why? The simple truth is there isn't a long list of medical problems that cause hypocholesterolemia. In fact, when I see results showing low cholesterol, I get a little giddy because I know my life just got a lot easier in terms of figuring out what's wrong with my patient. There are four major medical problems for which hypocholesterolemia is a common biochemical abnormality:

1. Protein-losing enteropathy
2. Exocrine pancreatic insufficiency
3. Hypoadrenocorticism (Addison's disease)
4. Liver dysfunction, including liver shunts,

There are a few other possible causes of low cholesterol, including profound chronic inflammation and certain cancers like acute myeloid leukemia, histiocytic

sarcoma, and multiple myeloma. But I consider these zebras. Huh? Remember the phrase:

When you hear hoofbeats, think horses, not zebras.

Dr. Theodore Woodward, Professor at the University of Maryland School of Medicine

In other words, when it comes to low cholesterol, it's important to rule out the most common causes - aka the horses - before looking for the zebras.



The take-away message...

Low cholesterol or hypocholesterolemia is a useful biochemical abnormality because it's associated with only a few health problems. Such a finding helps veterinarians narrow their diagnostic investigation, enabling them to ultimately efficiently diagnose and appropriately treat their patients.

To find a board-certified veterinary internal medicine specialist, please visit the [American College of Veterinary Internal Medicine](#).

Wishing you wet-nosed kisses,

CriticalCareDVM