

Hypocalcemia in Dogs

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What is hypocalcemia?

The term "calcemia" refers to the level of calcium in the blood. Calcium is a natural element found in the body and on the earth. It's abbreviated on the periodic table as "Ca."

Hypocalcemia means low calcium, while hypercalcemia means high calcium. Both conditions can potentially be life threatening, and should be treated as soon as possible. Causes and treatment for hypocalcemia and hypercalcemia are very different. [Click here for more information on hypercalcemia in dogs.](#)

Diagnosing hypocalcemia

The diagnosis of hypocalcemia is based on two blood tests: a total serum calcium level and an ionized calcium level (often abbreviated iCa). A total serum calcium level is very easy to measure, and most veterinarians can routinely test for this. Normal total serum calcium is approximately 8-11 mg/dL, with significant hypocalcemia being defined as usually less than 7 mg/dL. An ionized calcium level is slightly more difficult to measure, and is only readily available as a send-out test--or at most specialty clinics or emergency clinics. Ideally, an ionized calcium level should be performed as it is more specific and more accurate

Symptoms of hypocalcemia:

- Agitation
- Restlessness
- Panting excessively
- Excessive rubbing of the face
- Walking stiffly
- Fine muscle tremors
- Hyperthermia (i.e., elevated body temperature), secondary to tremoring

- Seizures
- Collapse
- Acute death (when untreated)

What causes hypocalcemia in dogs?

Hypocalcemia can be caused by numerous problems. I've included a few of the causes below:

- Low body protein
- Kidney failure
- Eclampsia
- Hypoparathyroidism
- Certain types of poisoning (e.g., [antifreeze](#), [FLEET](#) enemas in cats, etc.)
- Rickets (secondary to poor nutrition or an unbalanced diet)
- Blood transfusions

Low body protein

This is one of the most common causes for a low calcium level. Since some of the calcium in your dog's body is bound to protein, low protein levels in the body can result in low calcium levels. Often times, low protein may be seen from intestinal or kidney problems ([specifically protein-losing enteropathy \[PLE\]](#) and protein-losing nephropathy [PLN], respectively). Treatment of low protein is aimed at correcting the underlying disease (e.g., PLE, PLN, etc.).

Kidney failure

Kidney failure can result in either a hypocalcemia or hypercalcemia. This is typically due to a renal secondary hyperparathyroidism, which is the body's attempt to respond to high phosphorous levels.

Eclampsia

Eclampsia in dogs is when a nursing bitch suddenly develops a low calcium level secondary to the production of milk. This occurs more commonly in small breed dogs (like [Chihuahuas](#), [Yorkshire terriers](#), [Maltese](#), etc.) and may be related to poor diet or even calcium supplementation for several weeks prior to birth; the latter prevents the body from making more calcium since it's being supplemented orally. This is often seen several weeks after giving birth. Treatment includes calcium supplementation and removing the puppies from the mother. It is important that the puppies never be allowed to re-nurse off the mother, as it can re-stimulate another eclampsia episode.

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Hypoparathyroidism

The parathyroid gland is very important in regulating the calcium levels in the body. When the parathyroid gland is surgically removed (which may occur due to cancer or an overactive parathyroid causing hypercalcemia), post-operative complications may include hypocalcemia. The calcium level should be carefully monitored after surgery, and treatment includes calcium supplementation.

Poisoning

Certain poisons can result in low calcium levels in the body. The most deadly poison that affects calcium levels is antifreeze (otherwise known as ethylene glycol). Even a small amount of antifreeze is deadly for dogs and results in the production of calcium oxalate crystals that get stuck in the kidneys—causing acute kidney failure. Due to the metabolism of ethylene glycol, it results in an acute, transient hypocalcemia. Clinical signs of hypocalcemia aren't typically seen with antifreeze; rather, the signs of antifreeze poisoning are more apparent and severe. Treatment with the antidote for antifreeze (e.g., fomepizole/4MP or ethanol) must occur quickly—within 8-12 hours—otherwise, it is almost always fatal.

Another dangerous poison that causes hypocalcemia is phosphorous-containing enemas (e.g., FLEET) use in cats. One enema can potentially kill a cat so always check with a veterinarian before giving your cat an enema.

Lastly, there are a few types of insoluble calcium oxalate plants that can bind calcium in the body, resulting in hypocalcemia. These plants include rhubarb leaves, star fruit, and English shamrock.

Blood transfusions

Sometimes, we can see a low calcium level secondary to administration of a blood transfusion; this is only seen after a dog or cat has been treated with red blood cells, and it can be easy to monitor and treat post-transfusion.

Hypocalcemia treatment

Treatment for hypocalcemia typically includes the

following:

- An immediate veterinary visit to check blood calcium levels
- Treatment of the underlying disease or cause
- Possible intravenous (IV) fluids
- Treating with IV calcium (e.g., calcium gluconate), which needs to be given very slowly
- Thermoregulation and potential cooling measures if the temperature is > 104.5F
- Monitoring the electrolytes and the blood sugar frequently
- Oral calcium supplementation for days to weeks (once stable)
- Possible vitamin D supplementation, which helps the intestines absorb calcium more effectively
- Anti-seizure medication, if the seizures don't respond to supplementation

Thankfully, the prognosis for hypocalcemia is typically excellent to good once supplemented. When in doubt, seek immediate veterinary attention if your dog shows any signs, as the sooner it is identified, the sooner it can be treated.

If you have any questions or concerns, you should always visit or call your veterinarian -- they are your best resource to ensure the health and well-being of your pets.