HYPOCALCEMIA
(LOW LEVELS OF CALCIUM IN THE BLOOD)

BASICS

OVERVIEW
- "Hypocalcemia" is a low total serum calcium concentration in the blood
- "Parathyroid hormone" (also known as "parathormone" or "PTH") is produced by the parathyroid glands; it regulates calcium and phosphorus levels in the blood—it normally increases calcium levels by causing calcium to be reabsorbed from bone
- The "parathyroid glands" are small, hormone-secreting glands that are located on or near the thyroid glands; thus the name, as "para-" refers to "adjacent" or "alongside" and "thyroid" refers to the thyroid gland; the thyroid and parathyroid glands are located in the neck, near the windpipe or trachea

SIGNALMENT/DESCRIPTION of ANIMAL

Species
- Dogs and cats

SIGNS/OBSERVED CHANGES in the ANIMAL
- Signs of underlying disease may be seen without clinical signs of low levels of calcium in the blood (hypocalcemia), because the latter do not occur until total serum calcium falls below 6.7 mg/dl
- Seizures
- Muscle trembling, twitching, or involuntary contractions of groups of muscle fibers (known as "fasciculations")
- Wobbly, incoordinated or "drunken" appearing gait or movement (known as "ataxia") or stiff gait
- Weakness
- Panting
- Facial rubbing
- Vomiting
- Lack of appetite (known as "anorexia")
- Fever
- Cataracts in patients with low levels of parathyroid hormone (known as "hypoparathyroidism")

CAUSES
- Low levels of parathyroid hormone produced by the parathyroid gland (known as "primary hypoparathyroidism"); parathyroid hormone regulates calcium levels in the blood—it normally increases calcium levels by causing calcium to be reabsorbed from bone; "primary hypoparathyroidism" refers to a condition in which the glands do not produce adequate amounts of parathyroid hormone, resulting in a decrease in calcium levels and an increase in phosphorus levels in the blood
- Low levels of parathyroid hormone (hypoparathyroidism) secondary to surgical removal of the thyroid glands (known as "thyroidectomy") or other corrective treatments for excessive production of thyroid hormone (known as "hyperthyroidism") and subsequent parathyroid gland damage
- Hypoparathyroidism secondary to ultrasound-guided parathyroid gland radiofrequency heat ablation (for treatment of hyperparathyroidism or parathyroid masses) and parathyroid gland damage
- Kidney failure
- Ethylene glycol (chemical in many types of antifreeze) toxicity
- Oxalate toxicity (possible cause includes eating plants [such as lilies, philodendron])
- Sudden (acute) inflammation of the pancreas (known as "pancreatitis")
- Complication of pregnancy or nursing (known as "eclampsia")
- Phosphate-containing enemas
- Nutritional secondary hyperparathyroidism, caused by diets that have too much phosphorus and/or too little calcium and vitamin D—it is a type of malnutrition
- Abnormal absorption of calcium from the intestines
- Low levels of magnesium in the blood (known as "hypomagnesemia")
- Citrate toxicity
- Rickets (disease caused by vitamin D deficiency)

RISK FACTORS
- Complication of pregnancy or nursing (eclampsia)—usually seen in small-breed dogs during the first 21 days of nursing a litter

TREATMENT

HEALTH CARE

- Inpatient treatment for patients with clinical signs of low levels of calcium in the blood (hypocalcemia), in which underlying disease requires support
- Emergency treatment usually is only needed for certain patients (such as those with primary hypoparathyroidism, hypoparathyroidism secondary to hyperthyroid or hyperparathyroid corrective procedures and subsequent parathyroid damage, complications of pregnancy or nursing [eclampsia], recent phosphate-containing enema administration, and citrate toxicity)
- Short-term and long-term treatment usually is needed only to treat primary hypoparathyroidism and complications of pregnancy or nursing (eclampsia)

ACTIVITY

- Depends on condition and underlying cause

DIET

- Diet change recommended in patients with nutritional secondary hyperparathyroidism, caused by diets that have too much phosphorus and/or too little calcium and vitamin D—it is a type of malnutrition

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.

Emergency Treatment

- Calcium gluconate 10% solution—administered slowly through a vein
- Calcium chloride 10% solution—also effective; administered slowly through a vein; extremely caustic if it gets outside of the vein and into tissues surrounding the vein; more potent than calcium gluconate
- If the patient has complications from nursing (eclampsia), may need to remove the puppies from the mother and hand-nurse until weaned

Short-term Treatment Immediately After Emergency Treatment

- Following emergency use of calcium gluconate 10% solution, relapse of clinical signs can be prevented by use of one of the following: constant-rate intravenous infusion; administration of calcium gluconate diluted in saline three to four times daily under the skin (subcutaneous administration)

Long-term Treatment of Hypocalcemia

- Vitamin D is needed indefinitely; dose as recommended by your pet's veterinarian
- Calcium supplements given by mouth; type and dose of calcium supplement as directed by your pet's veterinarian

FOLLOW-UP CARE

PATIENT MONITORING

- For patients requiring long-term treatment for low levels of calcium in the blood (hypocalcemia), blood work (serum calcium concentration) should be assessed in 4 to 7 days following initial treatment, then if patient has normal calcium levels, repeat blood work monthly for the first 6 months, then every 2 to 4 months; more frequent monitoring may be necessary if calcium levels are low
- Goal of treatment is to maintain serum calcium concentration between 8 and 10 mg/dl on blood work

POSSIBLE COMPLICATIONS

- Low levels of calcium in the blood (hypocalcemia)
- Excessive levels of calcium in the blood (known as "hypercalcemia"), which can lead to kidney failure

EXPECTED COURSE AND PROGNOSIS

- Depend on underlying cause

KEY POINTS

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- Goal of treatment is to maintain serum calcium concentration between 8 and 10 mg/dl on blood work