



# Hyperparathyroidism

## (Excessive Levels of Parathyroid Hormone in the Blood)

### Basics

#### OVERVIEW

- “Hyperparathyroidism” is an abnormal condition in which high levels of parathyroid hormone (also known as “parathormone” or PTH) are circulating in the blood; “parathyroid hormone” regulates calcium and phosphorus levels in the blood—it increases calcium levels by causing calcium to be reabsorbed from bone
- “Primary hyperparathyroidism” refers to a condition in which a tumor in the parathyroid gland produces excessive levels of parathyroid hormone, leading to increased blood calcium levels
- “Secondary hyperparathyroidism” can be caused by a deficiency of calcium and vitamin D associated with malnutrition or long-term (chronic) kidney disease
- 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

#### GENETICS

- None known for primary hyperparathyroidism, but its association with certain breeds suggests a possible hereditary basis in some cases
- Secondary hyperparathyroidism can develop in association with hereditary kidney disease (known as “hereditary nephropathy”), but is not inherited per se

#### SIGNALMENT/DESCRIPTION OF PET

##### Species

- Dogs
- Cats

##### Breed Predilections

- Keeshond
- Siamese

##### Mean Age and Range

- Dogs—mean age, 10 years; range, 5–15 years of age
- Cats—mean age, 13 years; range, 8–15 years of age

## **SIGNS/OBSERVED CHANGES IN THE PET**

- Most dogs and cats with primary hyperparathyroidism do not appear ill
- Signs usually are mild and are due solely to the effects of high levels of calcium in the blood (known as “hypercalcemia”)
- Increased urination (known as “polyuria”)
- Increased thirst (known as “polydipsia”)
- Lack of appetite (known as “anorexia”)
- Sluggishness (lethargy)
- Vomiting
- Weakness
- Presence of stones (known as “uroliths”) in the urinary tract (condition known as “urolithiasis”)
- Stupor and coma
- Veterinarian may be able to feel enlarged parathyroid glands in the neck of cats
- Nutritional secondary hyperparathyroidism sometimes is associated with bone fractures and general poor body condition; “nutritional secondary hyperparathyroidism” is caused by diets that have too little calcium and vitamin D or too much phosphorus—it is a type of malnutrition

## **CAUSES**

- Primary hyperparathyroidism—PTH-secreting tumor (known as an “adenoma”) of the parathyroid gland; in most cases only one gland has a tumor; malignant tumors of the parathyroid glands are uncommon
- Secondary hyperparathyroidism related to malnutrition—nutritional deficiency of calcium and vitamin D or nutritional excess of phosphorus
- Secondary hyperparathyroidism related to long-term (chronic) kidney disease—calcium is lost through the kidneys and absorption of calcium is reduced through the intestinal tract due to deficiency in a hormone (known as “calcitriol”) produced by the kidneys or phosphorus is retained in the body

## **RISK FACTORS**

- Primary hyperparathyroidism—unknown
- Secondary hyperparathyroidism—calcium/vitamin D malnutrition or long-term (chronic) kidney disease

## **Treatment**

### **HEALTH CARE**

- Primary hyperparathyroidism generally requires inpatient care and surgery
- Secondary hyperparathyroidism related to malnutrition or long-term (chronic) kidney disease in non-critical pets can be managed on an outpatient basis

### **ACTIVITY**

- No alterations recommended

### **DIET**

- Calcium supplementation for secondary hyperparathyroidism, under the direction of your pet's veterinarian
- Low phosphorus diets for secondary hyperparathyroidism related to long-term (chronic) kidney disease, as directed by your pet's veterinarian

### **SURGERY**

- Surgery is the treatment of choice for primary hyperparathyroidism and is often important in establishing the diagnosis
- Surgical removal of a tumor of the parathyroid gland (surgical removal of a parathyroid gland known as a “parathyroidectomy”)
- Recently a technique using ultrasound-guided heat application through the skin (known as “percutaneous ultrasound-guided heat ablation”) has been used successfully for treatment of benign tumors of the parathyroid (known as “parathyroid adenomas”); this procedure may be recommended, if available

## 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.

- No medical treatment exists for primary hyperparathyroidism itself, rather treatment is directed at high levels of calcium in the blood (hypercalcemia)
- Normal saline is the fluid of choice for treatment of high levels of calcium in the blood (hypercalcemia)
- Medications to remove excess fluids from the body (known as “diuretics,” such as furosemide) and steroids can be useful in treating high levels of calcium in the blood (hypercalcemia)
- Secondary hyperparathyroidism related to long-term (chronic) kidney disease is sometimes treated with the hormone, calcitriol, but its use has not gained wide acceptance
- A new class of medications that mimic calcium to lower parathyroid hormone levels (known as “calcimimetic drugs”) is being used to treat secondary hyperparathyroidism related to long-term (chronic) kidney disease in people, but studies of these drugs in dogs and cats have not been reported
- Pamidronate is a bisphosphonate used to prevent bone loss and osteoporosis; it has been used to treat high levels of calcium in the blood (hypercalcemia) of various causes in dogs and cats
- Post-operative low levels of calcium in the blood (known as “hypocalcemia”) requires treatment with vitamin D and calcium supplements; the hormone, calcitriol, is recommended

## Follow-Up Care

### PATIENT MONITORING

- Post-operative low levels of calcium in the blood (hypocalcemia) is relatively common after surgical removal of one or more parathyroid glands for treatment of primary hyperparathyroidism, especially in pets with presurgical serum calcium concentrations greater than 14 mg/dl; check serum calcium concentrations once or twice daily for 1 week after surgery
- Ionized calcium levels should be monitored to guide dosage adjustments when treating post-operative low levels of calcium (hypocalcemia) with vitamin D, calcium supplements, or calcitriol
- Check bloodwork (serum concentrations of urea nitrogen and creatinine) in pets with kidney disease

### PREVENTIONS AND AVOIDANCE

- No strategies exist for prevention of primary hyperparathyroidism
- Secondary hyperparathyroidism related to malnutrition is prevented by proper nutrition

### POSSIBLE COMPLICATIONS

- Irreversible kidney failure secondary to high levels of calcium in the blood (hypercalcemia)
- Low concentration of calcium in the blood (hypocalcemia) is a potential complication of surgical removal of the parathyroid gland (parathyroidectomy)

### EXPECTED COURSE AND PROGNOSIS

- Untreated disease usually progresses to end-stage kidney or nervous system disease
- Prognosis for surgical treatment of tumors of the parathyroid gland (parathyroid adenoma) is excellent
- Recurrence is seen in a small percentage of cases
- In pets that develop post-operative low levels of parathyroid hormone (known as “hypoparathyroidism”), the return of normal parathyroid gland function is unpredictable and can take weeks to months

## Key Points

- Signs generally are related to changes in calcium status of the body
- Low concentration of calcium in the blood (hypocalcemia) is a potential complication of surgical removal of the parathyroid gland (parathyroidectomy)

# Notes

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