**CANINE CALCIUM OXALATE AND STRUVITE/CALCIUM PHOSPHATE CARBONATE UROLITHS**

Urooliths with calcium oxalate (CaOx) and struvite or calcium phosphate carbonate indicate that two diseases processes are occurring concurrently or in succession. In almost all dogs, struvite and calcium phosphate carbonate form because of urinary tract infection. When infection is consistently prevented, struvite and calcium phosphate carbonate are unlikely to recur. CaOx is a difficult stone to prevent because factors responsible for formation are incompletely understood. Therefore, risk management strategies other than antibiotics are prioritized to minimize CaOx.

**MINIMIZING RECURRENCE**

**DIAGNOSTIC CONSIDERATIONS**
- Measure blood total and ionized calcium.
- Investigate causes for hypercalcemia when present.
- Test for hereditary CaOx1 in young (<3yr) at risk breeds (English bulldog, Boston Terrier, Bullmastiff, Rottweiler, Staffordshire terrier and related) at [UMN Canine Genetics Laboratory](http://www.cgen.umn.edu). Culture urine

**MEDICAL CONSIDERATIONS**
- Administer culture-susceptible antibiotics for 3-7 days for sporadic infections. See detailed struvite recommendations for recurrent infections.
- Potassium citrate if urine pH is consistently <6.5 (starting dose: 75mg/kg q12-24h).
- Correct hypercalcemia based on cause.
- Hydrochlorothiazide (2mg/kg q12-24) with frequently recurrent CaOx in normocalcemic dogs.

**NUTRITIONAL CONSIDERATIONS**
- Canned lower sodium foods that do not overly acidify urine (e.g. c/d multicare, g/d, i/d low fat, others).
- If needed, feed canned therapeutic foods or add water to food to lower urine specific gravity below 1.020.

**MONITORING CONSIDERATIONS**
- Urine culture every 1-3 months and with urinary signs of disease.
- Urinalysis every 3 to 6 months to adjust pH to ≥ 6.5, and urine specific gravity to ≤ 1.020.
- Medical imaging every 6 to 12 months to detect recurrent stones when small to permit their easy removal without surgery.

**DIAGNOSTIC CONSIDERATIONS**
- Measure blood total and ionized calcium.
- Investigate causes for hypercalcemia when present.
- Test for hereditary CaOx1 in young (<3yr) at risk breeds (English bulldog, Boston Terrier, Bullmastiff, Rottweiler, Staffordshire terrier and related) at [UMN Canine Genetics Laboratory](http://www.cgen.umn.edu). Culture urine

Support from [Hills Pet Nutrition](http://www.hillspet.com), veterinarians, and pet owners make our work possible.