FELINE URATE

The primary etiology underlying ammonium urate uroliths in most cats is unknown. Although porto-vascular anomalies have been identified in some, this abnormality is uncommon. Small quantities of urate (10% or less) can be admixed with struvite and/or calcium oxalate, and until proven otherwise, is not considered clinically important when developing a prevention plan.

PREVENTION

** Review manufacturer’s therapeutic food literature to determine indications/contraindications. For pets with multiple health concerns, consult a veterinary nutritionist to select an optimal food.

In depth recommendations and references are available on our website: urolithcenter.org under the resources tab.
FELINE AMMONIUM URATE UROLITHS
Ammonium urate uroliths represent approximately 5% of all feline uroliths submitted to our center. The causes underlying ammonium urate urolith formation in most cats are unknown. Although portovascular anomalies have been identified in some, this abnormality is uncommon. Protocols designed to consistently dissolve ammonium urate uroliths in cats have not yet been developed. Minimally invasive procedures or surgery remain the most reliable methods to remove active uroliths from the urinary tract.

Consider These Facts:
- Urate crystalluria is not commonly observed in cats. In a 2007 study at the University of Minnesota, neither urate nor amorphous urate crystals were observed in cats with ammonium urate uroliths. Urate uroliths are typically radiolucent. In a 2007 study at the University of Minnesota, only 2 of 6 cats had uroliths sufficiently radio-opaque to be detected by survey radiography. Contrast cystography or ultrasound are necessary to consistently visualize urate uroliths in the urinary tract.
- We have successfully dissolved ammonium urate uroliths in 2 cats with a combination of allopurinol (15mg/kg PO q12 hr in one cat, and 15 mg/kg PO q24hr in the other) and canned Prescription Diet® k/d® Feline.
- In a retrospective study, urate urolith recurrence was detected in 13% of cats; recurrent uroliths were detected 1.8 ± 1.0 years following initial removal. Compared to uroliths composed of struvite or calcium oxalate, the recurrence rate was greatest for urate.
- In an in vitro study, the most effective urine pH to prevent ammonium urate formation was 6.6. Prescription Diet® k/d® Feline is formulated to produce urine with a pH of 6.6 to 6.9. To minimize dietary purines, Prescription Diet® k/d® Feline contains relatively lower levels of high quality protein.
**PREVENTION OF FELINE AMMONIUM URATE UROLITHS**

**Therapy:**
- Correction of portovascular anomalies, when diagnosed, appears logical. However, further studies are needed to determine the efficacy of hepatic vascular restoration on urate urolith recurrence.
- Consider diets with reduced protein (and therefore reduced purines) that promote formation of urine with a pH ≥ 6.6 (e.g. Prescription Diet® k/d® Feline fits these criteria)

**Monitor:**
- Urinalysis in 1 month and then every 3 to 6 months
- Consider appropriate medical imaging every 6 months, or sooner in patients with recurrent urinary signs.

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**Urine pH ≥ 6.6 & USG ≤ 1.030**

- These parameters are ideal for successful urate prevention
  - To verify, measure using pH meter
  - With repeatable aciduria, consider diets with less acidic precursors or addition of potassium citrate
  - Continue therapy and monitor every 3 to 6 months

**Urine pH < 6.6**

- Encourage feeding only canned food.
- Alternatively, additional water can be added to any food formulation

**USG > 1.030**

- Verify persistent, in vivo crystalluria by reevaluating an appropriately collected (in hospital) fresh urine sample analyzed within 30 minutes
- If persistent, add more water to food to reduce concentrations of crystallogenic minerals

**Struvite Crystalluria**

- Consider minimally invasive techniques or surgery to remove recurrent uroliths.
- Submit retrieved uroliths for quantitative analysis

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Albasan H: Rate and Frequency of Recurrence of Uroliths After an Initial Ammonium Urate, Calcium Oxalate, or Struvite Urolith in Cats. JAVMA 2009; 235:12: 1450
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