

# Minnesota Urolith Center \* UNIVERSITY OF MINNESOTA

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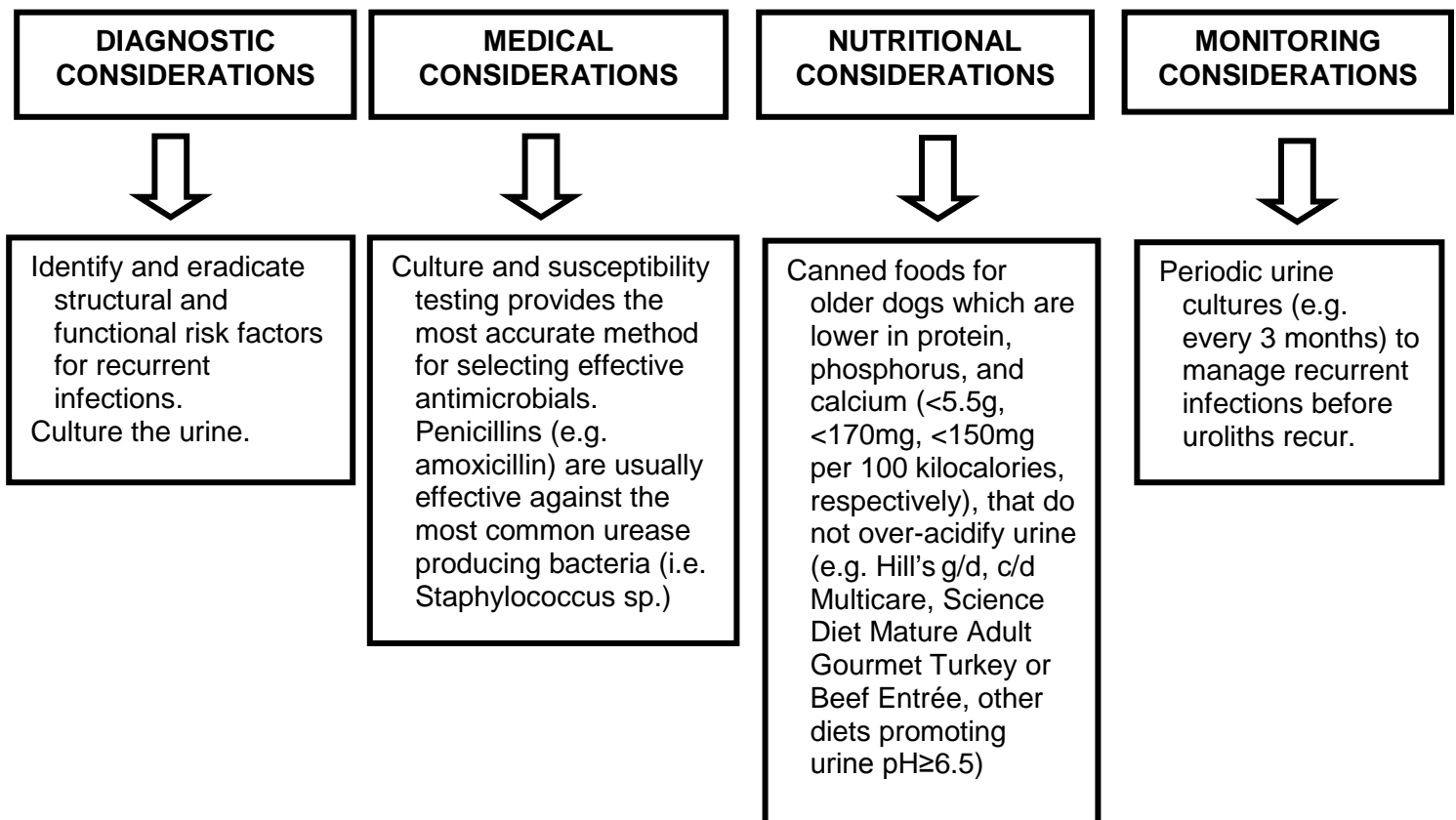
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## CANINE CALCIUM PHOSPHATE CARBONATE UROLITHS IN DOGS

Like struvite, calcium phosphate carbonate forms as a consequence of urinary tract infection with bacteria that produce the enzyme urease. Uroliths recur when urinary tract infections are inadequately prevented.

Calcium phosphate carbonate commonly forms in breeds that are also at risk for calcium oxalate uroliths (Shih Tzu, Bichon, miniature Schnauzer, etc.). We hypothesize that increased calcium excretion in combination with urinary tract infection are important risk factors for calcium phosphate carbonate. Therefore, avoid prevention therapies that increase the risk for calcium oxalate (i.e. do not overly acidify urine).

## 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.

**Indepth recommendations and references are available on our website: [urolithcenter.org](http://urolithcenter.org) under the resources tab.**

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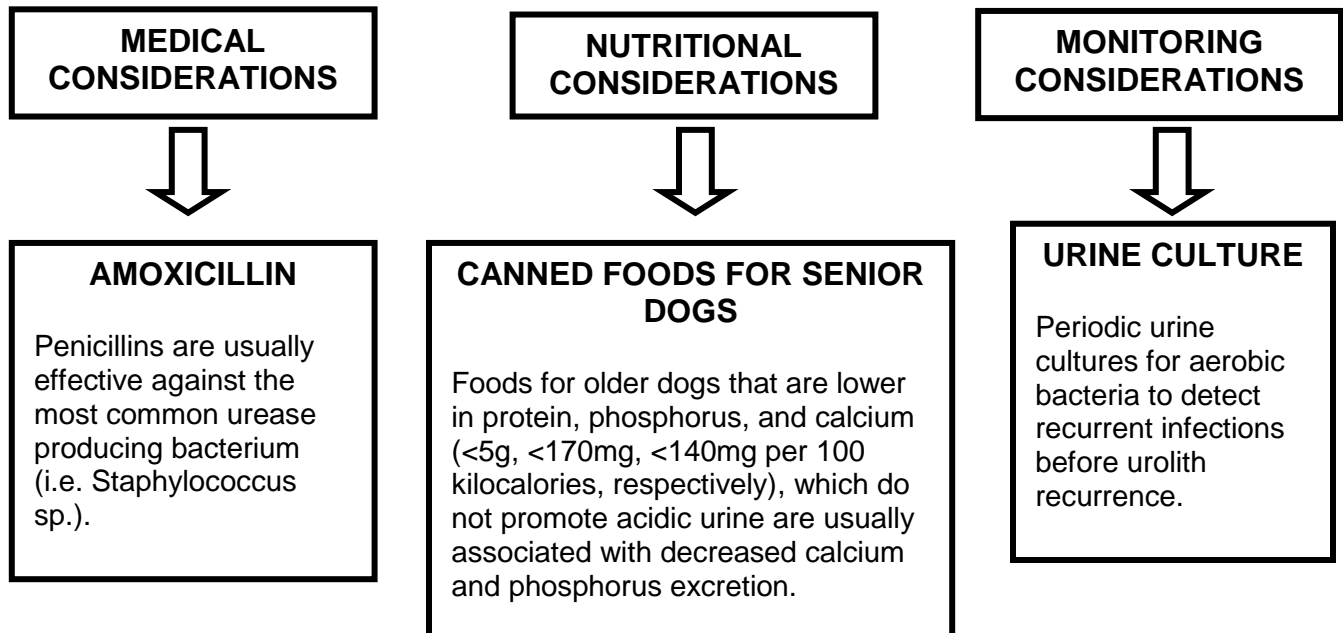
<http://www.cvm.umn.edu/depts/minnesotaurolithcenter>

### CANINE CALCIUM PHOSPHATE CARBONATE UROLITHS IN DOGS

Uroliths composed primarily of calcium phosphate carbonate are uncommon. However, this mineral in small quantities is commonly associated with uroliths composed of struvite because both minerals form as a consequence of urinary tract infection with bacteria (e.g. *Staphylococcus* sp. & *Proteus* sp.) that produce urease. When urease hydrolyzes urea, carbonates are formed and urine pH increases; both are risk factors for calcium phosphate carbonate precipitation. Although struvite is readily amenable to medical dissolution, calcium phosphate carbonate appears less amenable to a similar dissolution protocol. It may be possible that struvite uroliths that contain smaller amounts of calcium phosphate carbonate, (e.g. less than 30% in any layer) can be medically dissolved by protocols designed for struvite dissolution (see recommendations for Canine Struvite Uroliths at [urolithcenter.org](http://urolithcenter.org)).

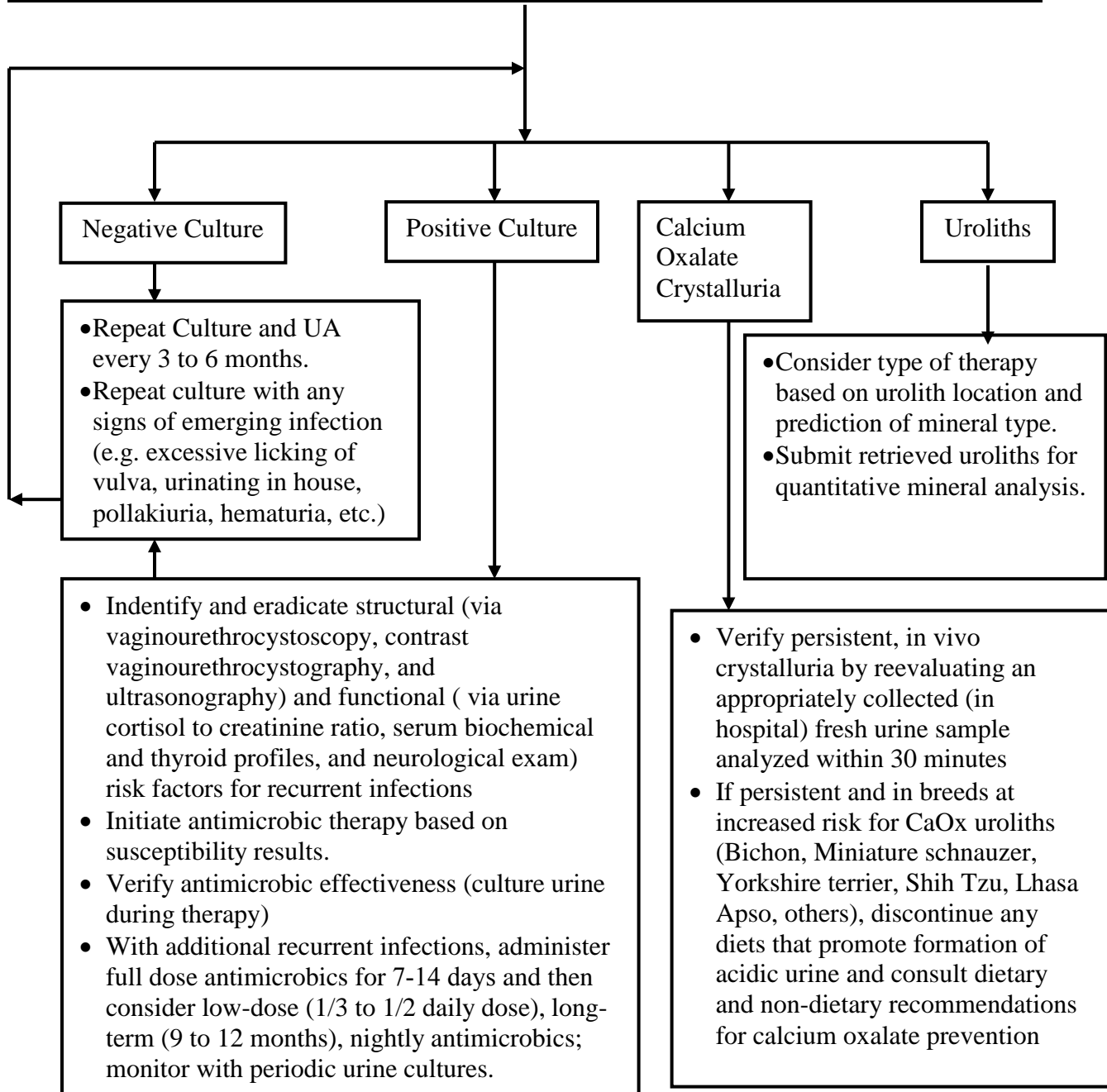
Calcium phosphate carbonate uroliths primarily form in female dogs (72%) presumably because females are at greater risk for urinary tract infections than male dogs. We have also recognized that breeds that form calcium phosphate carbonate uroliths (Shih Tzu, Bichon, miniature Schnauzer, etc.) are similar to those at risk for calcium oxalate uroliths. Therefore, we hypothesize that increased calcium excretion in combination with urinary tract infection with bacteria that produce urease are important risk factors favoring calcium phosphate carbonate urolith formation.

### PREVENTION



## PREVENTION OF CALCIUM PHOSPHATE CARBONATE UROLITHS IN DOGS

Monitor: Urine culture ( $\pm$  urinalysis) in 1 month and then every 3 to 6 months  
Consider medical imaging every 6 months, or sooner in patients with recurrent urinary signs



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