



# *Did You Know?*

## Urinalysis Revisited

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**Timing of urine collection:** Recently we reviewed best practices for timing of urine collection and submission of blood work; simultaneous is best, we all agree. However, we recognize the challenges of collecting a urine sample and remain committed to our clients by allowing urine to be submitted without time restriction after a wellness or Total Body panel has been performed. Some pets simply have an empty bladder at the time of the appointment and owners with their busy schedules may find it difficult to drop by a urine sample in a timely manner. But the inclusion of a urinalysis is important when assessing a blood profile and here are a few tips to optimize the value of the urinalysis.

The gold standard to evaluate renal function is the comparison of BUN, creatinine and urine specific gravity **at the same time**. Urine should also be collected before any treatment except in a life threatening emergency. Fluid therapy administered IV or SQ will quickly decrease urine specific gravity as will diuretics such as furosemide which stimulates urine production. Second best option is to collect the sample as soon as possible and take into account any influences on prior treatment.

**Have owner bring in a urine sample:** If a patient is coming in for blood work and a UA, ask the owner to bring in a midstream urine sample in a clean container prior to the appointment. Useful information can be gained from a free catch sample. Urine pH, specific gravity and dipstick values including glucose, ketones and protein are accurate. If the free catch sample is inflammatory, confirm with a cystocentesis sample to avoid contamination. A cystocentesis sample is preferred for culture.

**Early morning urine sample:** The urine cortisol:creatinine ratio is a screening test for hyperadrenocorticism, but false positives occur with stress. Therefore, a urine sample collected by the owner first thing in the morning is best. Some advise avoiding any behavioral stress a few days before sample collection. Early morning urine is also a great sample to assess urine concentrating ability. Water consumption, salt content of food, environmental temperature, etc. can all cause a transient decrease in urine specific gravity. Having an owner collecting a urine sample in the morning with minimal water consumption overnight can help us best assess the concentration. If the urine is concentrated, above 1.030 in the dog, renal concentrating ability is considered normal. Below 1.030, additional testing might be needed. Water deprivation testing is considered dangerous and other tests should be used to diagnose disease conditions such as diabetes insipidus.

**Proteinuria:** The urine protein:creatinine (UP:UC) ratio is used to evaluate proteinuria on urine with an inactive sediment. A UP:UC ratio performed on a free catch sample is comparable to one taken by cystocentesis with the added benefit of ease of collection.

**In-Clinic Urinalysis:** When done in clinic, the urinalysis should be run as soon as possible; within an hour is ideal. If crystalluria as real or an artifact, the urinalysis should be done at body temperature or within 30 minutes as cooling of the urine changes the solubility of urine crystals.



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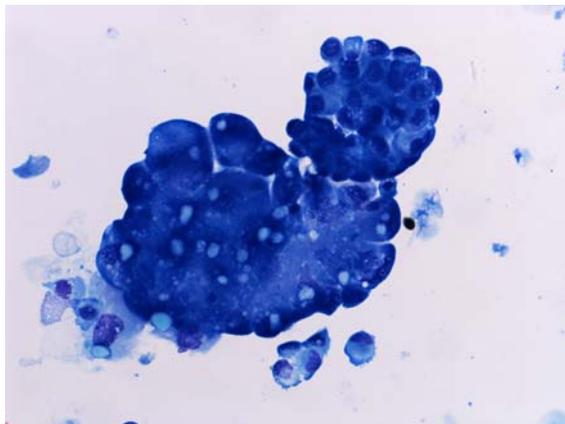
Calcium oxalate and struvite can form with urine cooling and storage. If there is going to be a delay in performing the UA, the sample should be refrigerated and then allowed to warm to room temperature. Urine for culture should be refrigerated to inhibit growth of contaminants, but prolonged refrigeration (over 6 hours) may affect growth of true pathogens.

**Urinalysis at Phoenix:** Submit urine in a sterile container such as a clear top tube or urine transport tube. The plastic red top tubes have a crystalline additive that activates clotting of blood for serum harvesting and should not be used. Standards for normal urine sediment are based on a sample size of five (5) milliliters. Please indicate how urine was collected (cystocentesis, catheterization, or free catch) on the test request form.

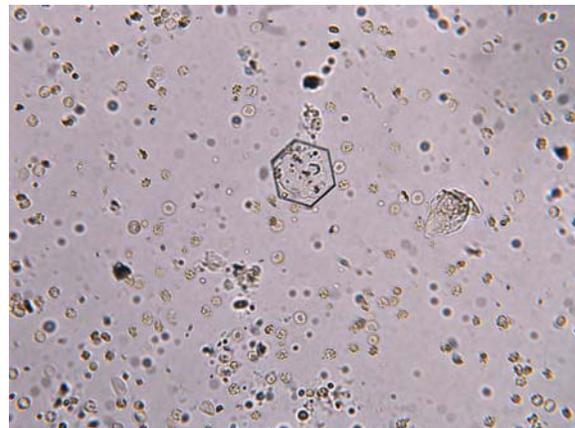
At Phoenix, a small amount of urine is routinely saved before centrifugation in the advent the clinic adds on a urine culture. Urine specific gravity and dipstick evaluation are performed on the supernatant. Ketones, protein and glucose positives are further verified with subsequent testing. The sediment examination is performed on an unstained wet mount of the urine and verified by examination of a stained urine sediment slide. These stained slides are saved for several weeks in case a future review is required.

For any urinalysis that reveals a moderate amount of epithelial cells, a concentrated cytopsin slide preparation is made of the sediment. The urine sediment and cytopsin slides are submitted for a pathologist review for overall impression, and particularly to assess epithelial cells for criteria of malignancy. The pathologists also review any urine sediment that the technicians find concerning, including the presence of unusual crystals and organisms such as yeast. In addition, a pathologist review of the urine sediment will be performed on any sample for which the test request form indicates a concern for urinary tract neoplasia. These pathologist reviews are always done at no charge. A clinic can also call after the UA results are received and request a pathologist review. History is always appreciated.

Urine samples are refrigerated and saved for six days at Phoenix.



*Epithelial cell cluster, urine sediment cytopsin, 50x*



*Cystine crystal, urine wet mount, 40x*