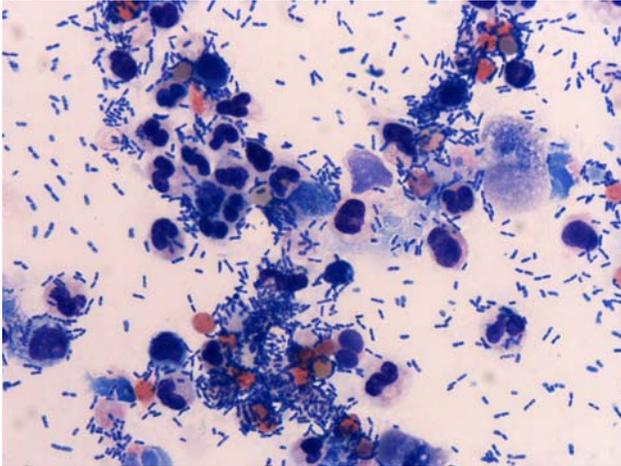




# *Did You Know?*

## Bacteria in the Urine



Wrights Giemsa Stain 100x oil



Unstained urine sediment 40x

Urinary tract infections are relatively common in veterinary medicine but misdiagnosis of infections is equally if not more common.

The key to not **over** diagnosing an infection: an experienced microscopist who can accurately detect bacteria in the urine AND using a urine culture for conformation and treatment options. Key to not **under** diagnosing an infection: an experienced microscopist AND performing a urine culture even in the absence of bacteruria, when culture is indicated.

At Phoenix, urine sediment slides are read unstained so that stain precipitates, and stain contamination do not interfere with the interpretation. For each urinalysis, an air-dried urine sediment slide is also made, stained with a Romanowsky type stain used for hematology (commercial dip stain could be used in-clinic) and examined to confirm the presence and type of bacteria.

Rod bacteria are a common cause of urinary tract infections and can be seen singly or in chains. These include *E. coli*, *Proteus sp.*, *Pseudomona sp.*, *Klebsiella sp.*, etc. Bacterial cocci bacteria are seen in pairs, ie. *Staphylococcus sp.* and chains, ie. *Streptococcus sp.*, *Enterococcus sp.* Cocci bacteria do not occur singly. If single round material is seen on a urine sediment exam, it is debris, not bacteria.



## *Did You Know?* **Bacteria in the Urine**

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Bacterial culture of the urine is the “gold standard” for diagnosing a urinary tract infection. Pathogenic bacteria are hearty and will grow on culture plates and in enrichment broth. Bacteria are most likely contaminants if seen in low numbers on a sediment exam and the bacterial culture is negative, unless the patient is currently on antibiotics. Seeing bacteria on the slide does not mean they will grow on culture; they may be non-viable.

Bacterial quantification is helpful in determining whether a particular bacteria may be significant and a source of infection or a contaminant. Generally:

Free catch: Significant if greater than 100,000 cfu/mL in dogs, 10,000 cfu/mL in cats

Catheterized sample: Significant if greater than 10,000 cfu/mL in dogs

Cystocentesis sample: Significant if greater than 1,000 cfu/mL in dogs and cats

Most urinary tract infections are caused by a single species of bacteria. Mixed cultures are most likely contamination. Bacterial quantification can only be done on a urine sample, not from culture plates or swabs submitted to the laboratory.

Generally greater than 10,000 cfu/mL rods or 100,000 cfu/mL cocci must be present before they are seen on sediment exam. Therefore, it is important to culture urine in certain situations even though bacteria are not seen on the sediment exam. These situations include: pyuria, hematuria, persistently dilute or alkaline urine, urolithiasis, renal failure, diabetes and hyperadrenocorticism, chronic steroids or any time the clinician feels the patient might be at risk. Urine should be cultured with chronic recurring or relapsing infections. Note that culturing the urine 5-7 days into a treatment for a recurrent or relapsing infection can be informative. If the urine culture is negative, the antibiotic may be working, or interfering with the culture and the bacterial infection could still be present, but if the culture is positive, treatment is definitely not working.

*SW/kf*  
*10/4/11*