

More urine sediment images with explanations are found on the **Complete Urinalysis Education** CD-ROM, provided with your IDEXX VetLab® UA™ Analyzer.

Contact your IDEXX representative or your distributor representative for more details.

For more information, go to [www.idexx.com/ua](http://www.idexx.com/ua)

# IDEXX

## Urine Sediment Guide



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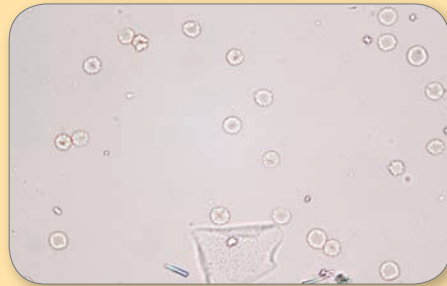


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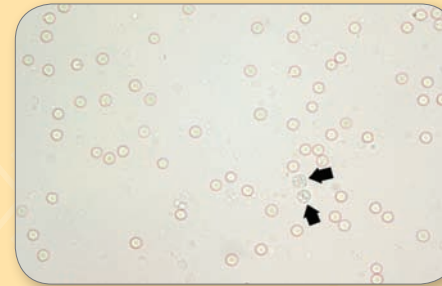
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# Urine Sediment Guide

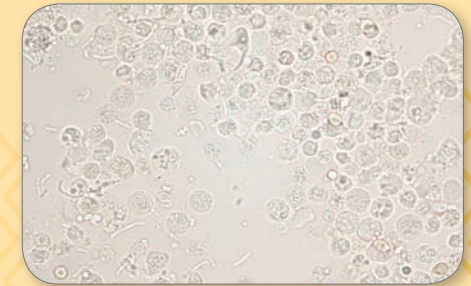
## Cells



**Figure 1** Erythrocytes and one squamous epithelial cell



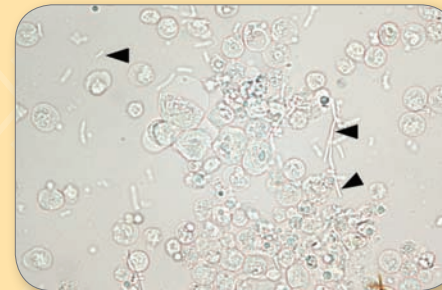
**Figure 2** Erythrocytes and two leukocytes (black arrows)



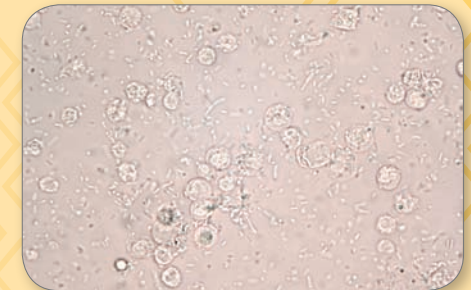
**Figure 3** Numerous leukocytes and few rod-shaped bacteria



**Figure 4** Many rod-shaped bacteria  
100x objective field of view



**Figure 5** Many leukocytes and large rod-shaped bacteria (black arrowheads)



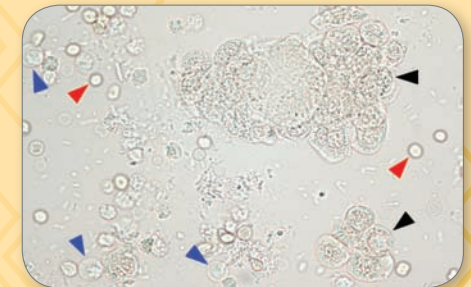
**Figure 6** Numerous bacteria and leukocytes



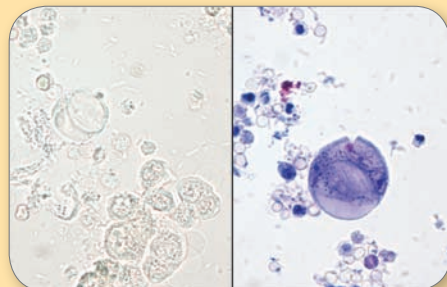
**Figure 7** Transitional epithelial cells



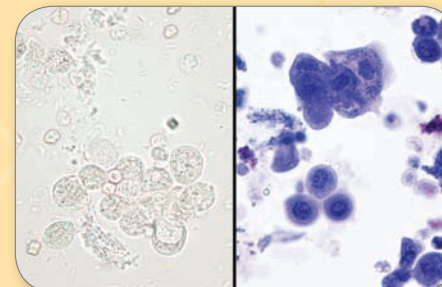
**Figure 8** Squamous epithelial cells



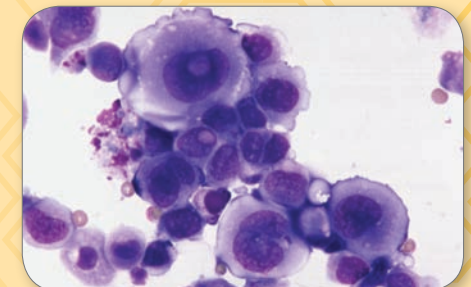
**Figure 9** Epithelial cells (black arrows), RBC (red arrows) and WBC (blue arrows)



**Figure 10** Transitional cell carcinoma  
(NMB wet prep on right)



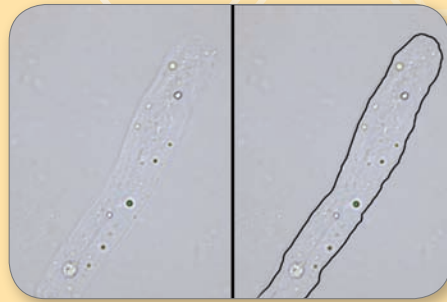
**Figure 11** Transitional cell carcinoma  
(NMB wet prep on right)



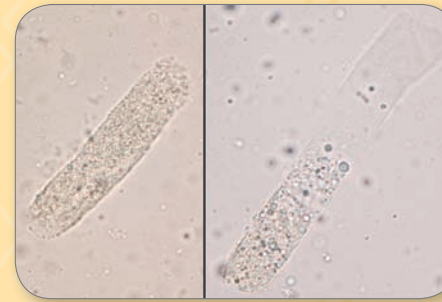
**Figure 12** Transitional cell carcinoma—  
air-dried and Diff-Quik® stained



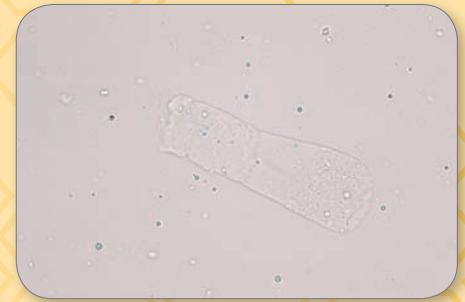
## Casts



**Figure 13** Hyaline cast (borders outlined)

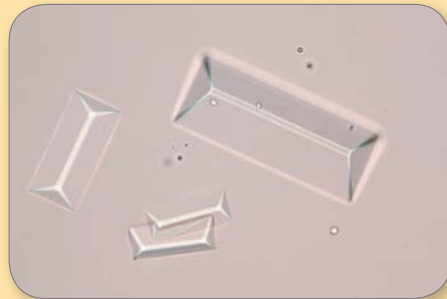


**Figure 14** Granular (left) and mixed waxy and granular (right) casts

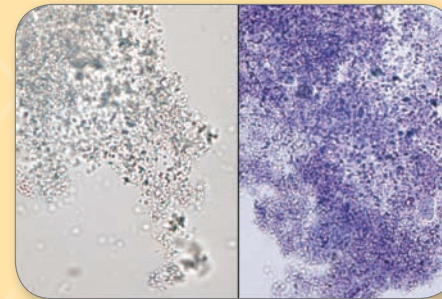


**Figure 15** Waxy cast

## Crystals and Miscellaneous



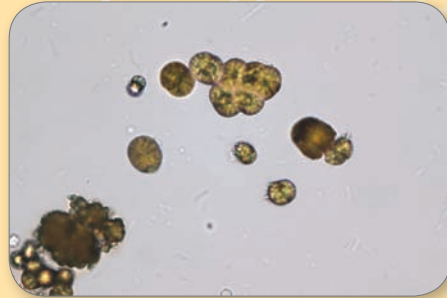
**Figure 16** Struvite



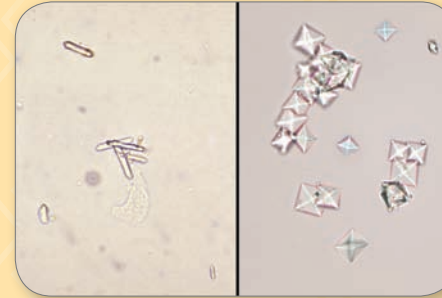
**Figure 17** Amorphous (NMB wet prep on right)



**Figure 18** Bilirubin



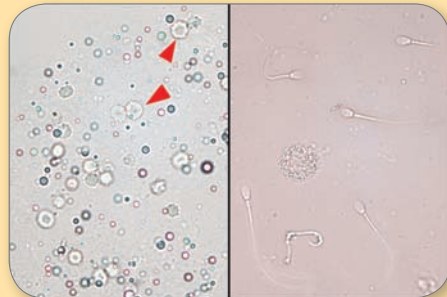
**Figure 19** Ammonium urate



**Figure 20** Left: Calcium oxalate monohydrate  
Right: Calcium oxalate dihydrate



**Figure 21** Drug (Tribrissen™) crystals  
10x objective field of view



**Figure 22** Left: Fat droplets (red arrows, RBC);  
Right: Sperm



**Figure 23** Pearsonema plica



**Figure 24** Contaminant fragmented fiber

All images, unless otherwise indicated, are representative of a High Power Field of view (40x objective field of view)

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# IDEXX UA™ Strips

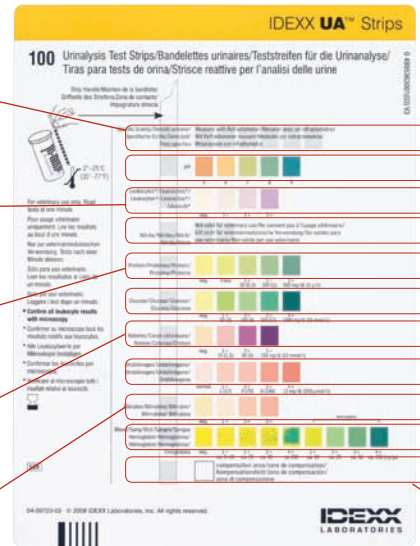
**Specific Gravity:** *The urine specific gravity should be measured with a refractometer*, which measures the density of the urine relative to the density of water. This value should be interpreted in light of the patient's hydration status and serum blood urea nitrogen (BUN) and creatinine levels.

**Leukocytes:** The leukocyte test pad detects the enzyme leukocyte esterase, not individual leukocytes. *Evaluation of urine leukocytes must be confirmed by urine microscopic examination.* The sensitivity and specificity of the leukocyte esterase test pad is questionable in veterinary medicine, especially in cat urine.

**Protein:** While small amounts of protein may normally be found in the urine, proteinuria can indicate both renal and nonrenal disease. If significant proteinuria is detected and there is an inactive sediment, urine protein:creatinine ratio (UPC) should be performed for protein quantification for accurate assessment and monitoring.

**Ketones:** Urine ketones are produced by the breakdown of lipids. Causes for elevations include diabetic ketoacidosis, prolonged fasting, starvation and low-carbohydrate diets.

**Bilirubin:** In dogs (especially male dogs) bilirubinuria is common even under normal conditions, but any bilirubinuria in cats is significant. Bilirubinuria usually precedes bilirubinemia because urine is commonly concentrated (hypersthenuric) compared to plasma.



**pH:** Urine pH is determined by the kidney's ability to regulate hydrogen ion and bicarbonate concentrations within the blood. Urine pH may reflect the animal's acid-base status if hydration status and overall plasma electrolyte balance are not markedly disturbed.

**Nitrite:** The nitrite test is not valid for veterinary use. The majority of bacterial infections in dogs and cats are not caused by organisms that reduce nitrate to nitrite. Both false positive and false negative results are common in veterinary medicine, making this assay too insensitive for general use.

**Glucose:** Glucose is not usually detectable in the urine of dogs and cats and must exceed the renal threshold for reabsorption to be noted. This value should be evaluated in light of the patient's activity status and blood glucose level.

**Urobilinogen:** Intestinal bacteria convert conjugated bilirubin to urobilinogen. A freshly produced urine sample is necessary for evaluation. The correlation between increases or decreases of urine urobilinogen and liver disease in animals is poor.

**Blood:** The blood/heme reaction detects heme groups found within hemoglobin and myoglobin. The test may be positive because of hematuria, hemoglobinuria or myoglobinuria.

**Compensation Pad:** This white pad, which is not impregnated with reagents, is used by the IDEXX VetLab UA Analyzer to compensate for the intensive intrinsic color of the urine that might affect the evaluation of the parameters for leukocytes, protein, glucose, ketone bodies, urobilinogen and bilirubin.

Interpretation (Expected Values)		
Analyte	Normal	Reporting Results
WBC	0-5 / HPF	Number / HPF
RBC	0-5 / HPF	Number / HPF
Epithelial Cells	0-Few / HPF	Number / HPF
Crystals	Variable	Number / LPF
Casts	0-Few / LPF	Number / LPF
Bacteria	0-Few / HPF	1 + to 4 + / HPF

Easy  
Efficient  
Consistent



IDEXX VetLab® UA™ Analyzer and IDEXX UA™ Strips

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