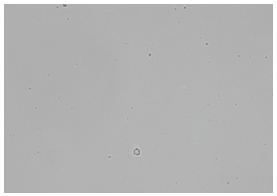
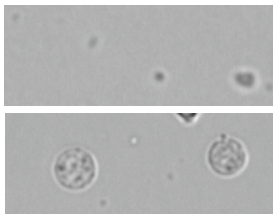
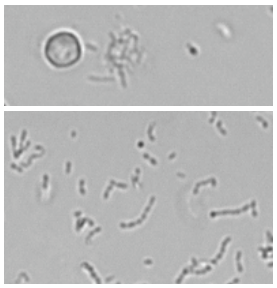
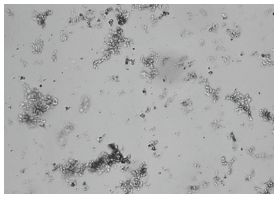
Bacteria and Urinalysis Guide

Bacteria results will be reported as “none detected,” “suspect presence,” or “present.” Bacteria can be difficult to differentiate from amorphous and crystalline debris. When the bacteria result is “suspect presence,” the report indicates that further differentiation is recommended. We strongly recommend starting with a visual review of the images. If the absence or presence of bacteria can be confirmed through visual review, consider adding a comment to the patient record.

In cases where images do not show clear evidence of bacteriuria, it may be necessary to perform additional confirmatory steps. You may also receive a “crystalline debris detected” message, indicating that you should be more discerning of the bacteria result given that debris can resemble bacteria.

If the bacteria result is...		And the patient has...	Then...
	**None detected**	No clinical signs/history	Bacteriuria is unlikely
	**Suspect presence** and the images show particles indicating debris or bacteria	No clinical signs/history	Bacteriuria is unlikely
		Clinical signs/history	Consider the SediVue Bacteria Confirmation Kit or a dry prep to differentiate bacteria from debris, artifacts, or amorphous crystalline material
	**Suspect presence** or **present** and the images show clear evidence of bacteria	Either clinical signs/history or no clinical signs/history	Dry prep typically not needed—consider culture and sensitivity (not all bacteria are viable)
	**Suspect presence** or **present** with crystalline debris detected	Either clinical signs/history or no clinical signs/history	If bacteriuria is suspected, consider the SediVue Bacteria Confirmation Kit or a dry prep to differentiate bacteria from debris, artifacts, or amorphous crystalline material
			If bacteriuria is not suspected, bacteriuria is unlikely

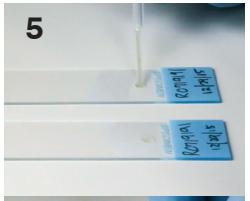
How to use the SediVue* Bacteria Confirmation Kit

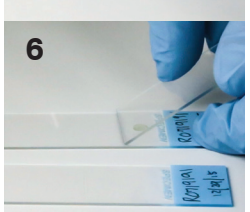
1. On the IDEXX VetLab* Station, select the patient from the **In-House Results** list, tap **Add Test**, tap the **SediVue Dx** icon, tap **Confirm Bacteria**, and then tap **Append Results**.
2. Dispense 165 µL of ***well-mixed*** urine and dispense it into a new sample tube.
3. Add 1 drop of Reagent 1 (red) to the same tube and invert the tube 5 times to mix.
4. Add 1 drop of Reagent 2 (blue) to the same tube and invert the tube 5 times to mix.
5. Inject 165 µL of the prepared sample into a cartridge on the analyser and press **Start**.

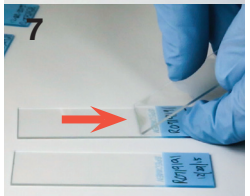
How to perform a dry prep

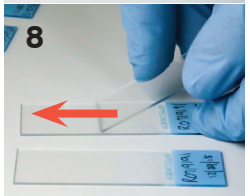
1. Fill a centrifuge tube with well-mixed, fresh urine taken from the bottom of the sample tube.
2. Centrifuge the sample on the **Urine** setting (or 400 g).
3. Gently aspirate the supernatant down to the pellet, leaving an extremely small amount of urine in which to resuspend the pellet.

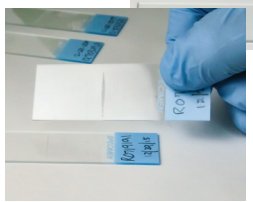
   Note: It may be challenging to obtain a pellet from dilute urine.
4. Lightly flick the bottom of the tube to gently resuspend the formed elements.
5. Dispense a drop of sample on a glass slide, similar to preparing a blood film.
6. Place a clean glass spreader slide at approximately 30°–40°, in front of the drop of urine.
7. Back the spreader slide into the drop, allowing the material to spread along the edge of the spreader slide.
8. Move the spreader slide toward the end of the specimen slide, keeping the two in contact with each other.
9. In the middle of the slide, abruptly stop spreading the urine sample and lift the spreader slide straight up to form a line of material.
10. Air dry thoroughly and then stain the slide using your routine haematology/cytology stain (e.g., Diff-Quik*).











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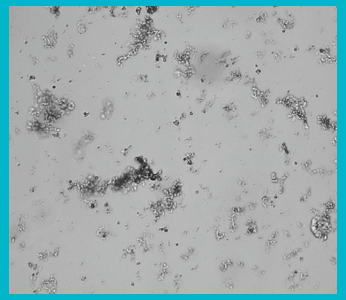
Bacteriuria: Important things to remember

Rods occur 2X more frequently than cocci[3]

- Bacteria can be present—even in significant numbers—with or without white blood cells (WBCs).[4]
- Most UTIs are the result of ascending bacteria from rectal or faecal contamination or from the distal urogenital tract.[5]
- 14% of dogs will experience a urinary tract infection (UTI) in their lifetime.[6]

Many things look like small dots

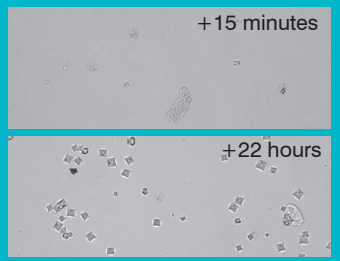
- Even university laboratory technicians have difficulty visually identifying bacteria. It's the leading reason that only 40% of positive samples examined using manual microscopy are confirmed by culture.[1]
- Lipid droplets, amorphous crystals, cellular debris, or artifacts may be mistaken for cocci.[2]
- When a rod is standing on end and is perpendicular to the focal plane, it can appear as a coccus.



- Do not rely on Brownian motion to identify bacteria as all small particles have it. *Proteus mirabilis* is the only common UTI pathogen that is motile.

Fresh is best

- Bacteria populations can double every 20 minutes.[7]
- Urine is not an ideal habitat for bacteria. Over time, bacteria can die or be phagocytised by the WBCs, making a positive sample appear negative by the time it reaches the reference laboratory.



References
1. Swenson CL, Boisvert AM, Gibbons-Burgener SN, Kruger JM. Evaluation of modified Wright-staining of urine sediment as a method for accurate detection of bacteriuria in dogs. *JAVMA*. 2004;224(8):1282–1289.
2. Swenson CL, Boisvert AM, Gibbons-Burgener SN, Kruger JM. Evaluation of modified Wright-staining of dried urinary sediment as a method for accurate detection of bacteriuria in cats. *Vet Clin Pathol*. 2011;40(2):256–264.
3. Reference laboratory data n = 412,000 samples, canine and feline only. Data on file at IDEXX Laboratories, Inc. Westbrook, Maine USA.
4. Rizzi TE, Valenciano A, Bowles, M, et al. *Atlas of Canine and Feline Urinalysis*. Ames, IA: Wiley-Blackwell; 2017:157–158.
5. IDEXX Laboratories, Inc. Diagnostic update, April 2017: Diagnosis and management of bacterial urinary tract infections in dogs and cats. https://www.idexx.com/files/urinalysis-dx-update-april-17.pdf. Published April 2017. Accessed March 19, 2020.
6. Ling GV. Therapeutic strategies involving antimicrobial treatment of the canine urinary tract. *JAVMA*. 1984;185(10):1162–1164.
7. Haugan MS, Hertz FB, Charbon G, et al. Growth rate of Escherichia coli during human urinary tract infection: implications for antibiotic effect. *Antibiotics*. 2019;8(3):92. doi: 10.3390/antibiotics8030092.

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