**Tips from the clinical experts**

**Edited by Daniel M. Baer, MD**

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**Answering your questions**

**Pyridium crystals in a urine sediment**

**Q** Are there such things as Pyridium crystals in a urine sediment?

**A** To my knowledge, crystals of Pyridium have not been described in urinary sediment. If other crystals are present in a urine specimen, however, it is quite possible that they could be stained with the Pyridium dye. This shows the importance of shape when identifying crystals in the urine sediment.

Pyridium (Parke-Davis) or phenazopyridine is used as an analgesic for relief when pain, burning, urgency, frequency, and other discomforts that result from irritation of the mucosa of the lower urinary tract. These symptoms may be the result of infection, trauma, surgery, endoscopic procedures, or the passage of stones or catheters. It is used for symptomatic relief of pain and not treatment.

Phenazopyridine produces a bright orange- to red-colored urine specimen. It resembles the color of urine containing bilirubin or urobilinogen, although the color is more vivid. Its presence presents a problem because it interferes with several reagent strip tests by masking or obscuring the color reaction, leading to false-positive results. Various constituents that may be present in the urine sediment, such as casts or casts — and at least, theoretically, crystals — might also be stained by the presence of phenazopyridine.

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**Gram stains from EDTA tubes**

**Q** Do you have any references that address the issue of using specimens that are received in sterile vacutainer tubes with EDTA additive (liquid or dry) for Gram-stain examinations? I know that EDTA and other additives can be toxic to bacterial specimens placed in this type of container and are, therefore, not suitable for culturing; however, I do not know of a reference that indicates that it is not suited for holding specimens for Gram staining. Will the EDTA cause the bacteria to lyse if it is placed in this medium? On rare occasions, I have examined peripheral smears from EDTA specimens from patients that are septic and contain either intracellular or extracellular cocci or bacilli, so I am aware that at least some bacteria can be safely transported in this medium for this purpose.

**A** There are several examples of cases where microorganisms have been identified in blood smears oruffy-coat preparations made from EDTA-containing tubes, using both routine hematology stains and/or the Gram stain.1-9 I am unaware, however, of a reference that specifically details the use of EDTA as a preservative or a “holding medium” for specimens awaiting a Gram stain.

Reports have shown, predominately in cases of severe bacteremia or fulminate sepsis, that organisms can be seen in peripheral blood smears prepared from blood anticoagulated with EDTA.1-6

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**References**


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**Refrigerating urine for uric acid analysis**

**Q** For the past 30 years that I have been working here, we have always asked our clients to refrigerate (or cool on ice) 24-hour urine collections. This is primarily to prevent offensive odors. For urine uric acid analyses, we mix the collection well, remove a 3-mL aliquot, adjust the pH to 10 to 11, heat the aliquot to 56°C for 10 minutes, again mix.

**A** Continue on page 45
well, then centrifuge and analyze. Recently, I read in an NCCLS guideline that 24-hour collections for uric acid should not be refrigerated. I have tried finding a reference for our collection and processing method but have not been successful. Can you help me with this? It would be difficult to validate our method without making the change, but making the change requires notification of all our many outreach clients.

A solute concentration, pH, storage time, and temperature all play a role in crystal formation. Precipitation of urates is often seen in acidic urine at 4°C. Amorphous urates are the most common urate precipitates and typically are of no clinical significance; other urates include uric acid, acid urates, and sodium urates. Uric-acid crystals are commonly seen in patients with gout and tumor lysis syndrome. Precipitated urates dissolve after addition of alkali or upon heating.

Massive amounts of amorphous urates can obscure clinically significant formed elements in urine on microscopic examination. Such interference is a potential problem in the study of all urinary sediments and, therefore, a consideration that is not exclusive to urine collections for uric-acid quantitation. Ideally, urine should be handled at a temperature similar to body temperature and analyzed quickly. Despite the risk of urate precipitation, urine should be refrigerated if analysis is not possible within two hours of collection. Refrigeration suppresses multiplication of bacteria, preserves urinary casts, and slows any shifts in urinary pH and osmolality.

If a 24-hour urine specimen is to be used for quantitative urate determination, NCCLS Document GP13-P does indeed state that the specimen should not be refrigerated. There is no apparent reason, however, that refrigeration would specifically affect urate determination, as long as precipitated urates are returned to solution prior to analysis. Interestingly, there is no recommendation in NCCLS Document GP16-A2 that urine specimens should not be refrigerated prior to urate determination.

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References

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