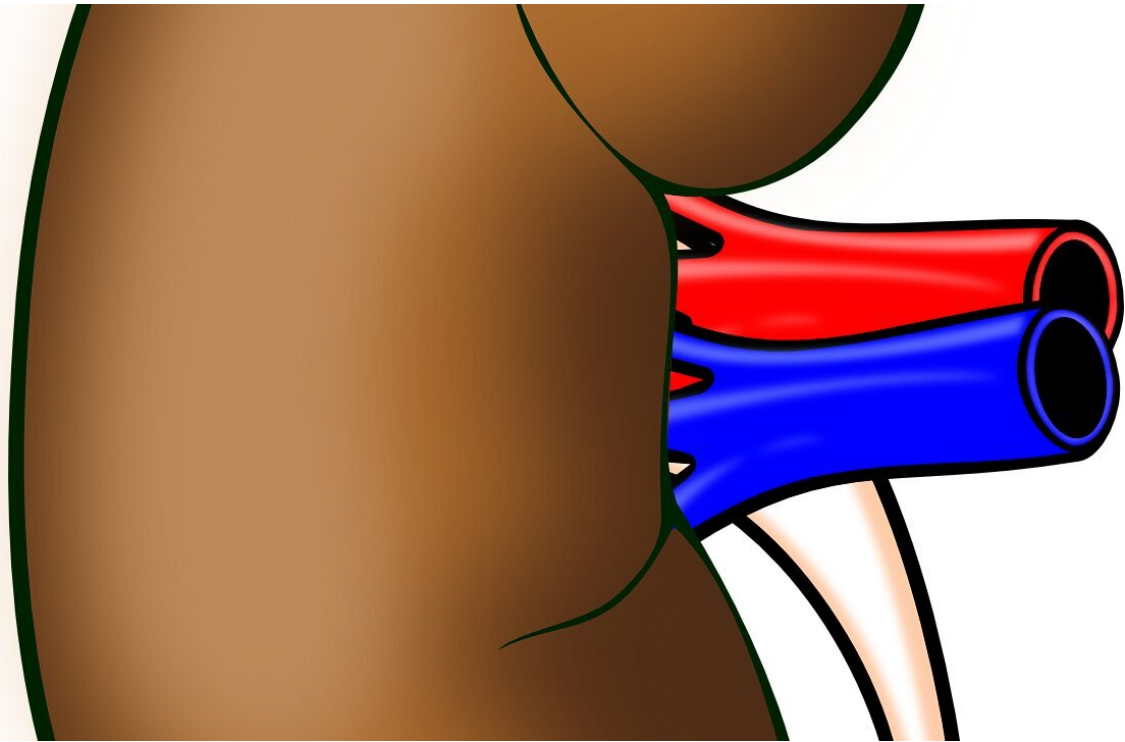


Urine sediment test results, diagnoses vary significantly across nephrologists

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A new study shows that nephrologists do not always agree on their interpretation of images from urine sediment tests, which are frequently ordered to evaluate a variety of kidney diseases. Led by researchers at Boston Medical Center and published in *JAMA Network Open*, the findings indicate the need to standardize education and training around

evaluating urine sediment tests to improve the test's reliability, and help prevent misinterpretation and potential patient harm.

Millions of [urine sediment](#) microscopy tests are conducted each year in the United States to diagnose conditions such as urinary tract infections and [kidney](#) diseases. The results of these tests are often used to make treatment decisions, such as whether it's necessary to conduct a kidney biopsy or use immunosuppressive medications to treat a patient. While the urine sediment examination has been widely used for decades, there have been few studies looking at the validity of the [test](#) or on the variability among nephrologists in their interpretation of the urine sediment test results.

"The urine sediment exam has played a fundamental role in taking care of patients with known or suspected kidney diseases—it's important to ensure that the tests are being interpreted appropriately," said Sushrut S. Waikar, MD, chief of the section of nephrology at Boston Medical Center and the study's corresponding author. The study team prospectively collected [urine samples](#) from adult participants who were undergoing a kidney biopsy at Brigham and Women's Hospital in Boston while Waikar was serving as director of Renal Ambulatory Services at the Brigham. During evaluation of the urine sediment through a microscope, the researchers collected [high-resolution images](#) and videos that were used during the analysis. These images and videos were distributed to 14 highly experienced nephrologists at teaching hospitals across the United States. The nephrologists were shown the same images and videos, and asked to identify features in the urine sediment and to provide a single suspected diagnosis based on the urine sediment findings.

The nephrologists disagreed with one another on several important urine sediment findings. The interobserver reliability—based on differences in responses from the nephrologists—ranged from moderate to substantial.

For example, important findings, such as white blood cell casts and red blood cell casts—which can indicate serious kidney diseases—were often interpreted differently across nephrologists. Other findings, such as granular casts, showed higher levels of agreement.

"Ideally, the interpretation of the urine sediment should be the same when done by different doctors," added Waikar, who also is the Norman G. Levinsky Professor of Medicine at Boston University School of Medicine. "Our study provides important information that can be used to address these variabilities in order to create a better, more reliable test."

The study authors note that, while doctors don't always agree, it's important to develop standardized training to teach doctors how to interpret urine sediment tests, ideally with a library of high resolution images and videos from patient samples. They also suggested the potential role for artificial intelligence approaches for image analysis to aid physicians with interpretation of this time-honored test in clinical medicine.

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More information: Ragnar Palsson et al, Assessment of Interobserver Reliability of Nephrologist Examination of Urine Sediment, *JAMA Network Open* (2020). [DOI: 10.1001/jamanetworkopen.2020.13959](https://doi.org/10.1001/jamanetworkopen.2020.13959)

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