

Letter to Editor

J Ped. Nephrology 2014;2(2):90-91  
<http://journals.sbm.ac.ir/jpn>

## A Cost Effective Innovation to Microscopic Study of Urine

Hamidreza Badeli, Afagh Hassanzadeh Rad\*

**How to Cite This Article:** Badeli HR, Hassanzadeh Rad A. A Cost Effective Innovation to Microscopic Study of Urine. J Ped. Nephrology 2014;2(2):90-91.

Pediatrics Growth Disorders Research Center, School of Medicine,  
Guilan University of Medical Sciences, Rasht, Iran

**\*Corresponding Author**

Afagh Hassanzadeh Rad  
17 Shahrivar Hospital,  
Rasht, Iran.  
Tel: 09112334073  
+98-01313229902  
Fax: +98-01313226101  
Email: [afaghrad@ut.ac.ir](mailto:afaghrad@ut.ac.ir)

The urinalysis is an informative and noninvasive diagnostic tool that is readily accessible to the clinician. Its results are important in the management of certain diseases and abnormal findings on a routine urinalysis, often in an asymptomatic patient, may be the first evidence of an underlying kidney disease [1-3].

A complete urinalysis encompasses physical, chemical, and microscopic examinations on the midstream clean specimen within two hours of collection. The microscopic examination is important and is used as a point of care testing in many medical academic divisions, especially in pediatric and adult nephrology wards, to detect and evaluate renal and urinary tract disorders, assess the pathologic slides, and investigate other systemic diseases [4-6].

Compound or high power microscopes typically have two eyepieces which view images through a single high-power objective lens. The image presented to each eye is a flat, 2-dimensional 'mono' image. Although the double headed microscope is very useful for two simultaneous observers, has ergonomic adjustable incline head for the teacher, is an excellent classroom

instruction tool in medical universities, helps doctors to point specific features of the specimen, and saves precious time because there is no need to take turns looking through one set of binocular eyepieces, it is an expensive device and many educational care centers could not afford it.

Therefore, in this study, we aimed to present a cost effective, accurate, accessible, and convenient method which could present the slides to an indefinite number of medical students, residents and fellows to reach our training goals in a cost effective manner. We placed a webcam in one eyepiece of the monocular or binocular microscope and then attached the webcam to a laptop or PC via a USB cable and the attendant simultaneously read the slides. In our experience, application of screens such as LED or LCD based on their higher resolution is recommended for sharp and high quality images. For the difference between the diameters of the eyepiece and the webcam, we circled a cardboard around the eyepiece and placed the webcam in it.

For more accurate images, we recommend a cylinder shaped webcam with higher resolution ( $\geq$  5 mega pixels) because it seems that the

resolution more than five mega pixel resolution results in better diagnosis.

Considering the importance of microscopic studies for detecting diseases and based on educational aims, it seems that access to a cost effective and accurate method such as our proposed method is very beneficial. Also, it should be mentioned that this method could be suggested for diverse assessments, even in kidney tissue biopsy and hematological investigations.

## References

1. Bereket, G., Bozdogan, G., Saribeyoglu, E., Arapoglu, M., Serteser, M. and Celiker, A. Use of urinalysis as a screening tool for asymptomatic infants. *Journal of Paediatrics and Child Health* 2013 49: 458-461. doi: 10.1111/jpc.12210
2. Simerville J.A, Maxted W.C, Pahira J.J. "Urinalysis: a Comprehensive Review," *American Family Physician* 2005;71(6):1153-1162.
3. Rabinovitch A, Arzoumanian L, Curcio KM, et al. Urinalysis-approved guideline, 3rd ed. Clinical and Laboratory Standard Institute, 2009; 29(4), Wayne, PA. file://www.clsi.org/source/orders/free/gp16-a3.pdf (Accessed on March 07, 2012).
4. Fogazzi GB, Verdesca S, Garigali G. Urinalysis: core curriculum. *Am J Kidney Dis* 2008;51:1052.
5. Perazella MA, Coca SG, Kanbay M, et al. Diagnostic value of urine microscopy for differential diagnosis of acute kidney injury in hospitalized patients. *Clin J Am Soc Nephrol* 2008;3:1615.
6. Perazella MA, Coca SG, Hall IE, et al. Urine microscopy is associated with severity and worsening of acute kidney injury in hospitalized patients. *Clin J Am Soc Nephrol* 2010;5:402.



Figure 1. Demonstrate the above process in 4 steps