

# Tim Hamill

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<b>UCSF</b> Medical Center <b>Clinical Laboratories</b>	<b>Point of Care Testing</b>
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## Urine Microscopy

### Principle

The urine microscopic examination is a method of identifying and quantifying cells, bacteria, and other materials in the sediment of centrifuged urine. This allows the practitioner to rule out or diagnose urinary tract infection and aids in the diagnosis of urinary tract or renal disease.

### SCOPE:

The procedure is performed in the Hospital and Ambulatory settings by Medical Doctors and Nurse Practitioners who have been trained and maintain annual competency in this procedure.

### Personnel

Licensed Medical Doctors  
Licensed Nurse Practitioners

### Reagents, Equipment and Materials

Clean plastic specimen containers  
Cleansing towelettes for clean catch technique  
Straight catheterization kits for catheterization  
Centrifuge  
Graduated, conical centrifuge tubes and caps  
Plastic pipettes  
Unfrosted microscope slides  
Cover slips  
Microscope with 10x and 40x lenses

## **Specimen**

The urine specimen is collected by the patient using the "clean catch" method (See Specimen Collection Procedures), or by a nurse or provider using sterile technique catheterization of the bladder. The specimen is placed directly into a clean plastic container and labeled with two forms of patient identification. The specimen is tested immediately so it does not require storage.

## **Procedure**

1. After testing urine, if necessary, with dipstick, place about 10mL in plastic conical tube labeled with patient's name and cover tube with tight fitting cover.
2. Place tube in centrifuge and place a second tube containing equal amount of water (with tight fitting cover on) directly opposite tube with urine, to act as counter weight.
3. Centrifuge urine specimen according to manufacturer's directions at 2000-4000 rpms for 5-10 minutes.
4. After centrifuge has stopped, remove tube and pour off the supernatant, leaving any sediment in the bottom of the tube.
5. With a plastic pipette, mix the remaining liquid and sediment and remove a few drops of the mixture. If there is no obvious sediment present, remove a few drops of urine from bottom of tube.
6. Place one drop of the sediment solution on a glass slide and cover with a cover slip.
7. Using the microscope, examine the sediment using phase contrast or bright light under low (10x) and high (40x) power, scanning several fields to obtain average numbers of formed elements.

## **Interpretation of Results**

Results reported as number of identified elements per high powered (40x) field are: WBC's, RBC's, and casts. The latter need to be identified as hyaline, WBC, RBC, epithelial, fatty, or waxy casts. Samples containing crystals should be forwarded to the Clinical Laboratory for evaluation.

Results reported as "few, moderate, or many" are: epithelial cells, bacteria, crystals, and trichomonas.

Identify presence of yeast (mycelial forms or hyphae).

Calculations: None.

## **Reporting Results**

Results should be recorded in the patient record done with the date/time the sample was collected and the name of the provider performing the examination.

## **Procedure Notes**

1. Sediment of centrifuged urine may be on side of tube, not on bottom of tube - observe first before withdrawing sediment specimen.
2. May need to use low light on microscope to see hyaline casts and hyphae forms of yeast fungi.
3. When cells are too numerous to count (over 1 OO/HPF) report as "many full fields". Also report WBC clumps.
4. Grossly bloody samples should be forwarded to the Clinical Laboratory for evaluation.

## **Limitations**

An inaccurate reading may be caused by one or several of the following errors made in specimen collection or technique:

1. Specimen not obtained by "clean catch" method and thus contains elements from sources other than the urinary tract (e.g., vaginal discharge, penile discharge).
2. Specimen not centrifuged long enough.
3. Urine extremely dilute so no sediment obtained, or not enough elements available in amount of urine tested.
4. Specimen not examined with proper lighting or focusing.
5. Microscope not functioning properly, e.g., lens dirty.
6. Examiner fails to recognize the elements on the slide.

## **References**

Illinois Masonic Medical Center, Urinalysis Procedure (Morris, 9/89)