

Laboratory Name
Laboratory Address

Test Name: Urine Microscopic Exam Procedure

Method or Principle: Microscopic examination on urine may be ordered by the physician or may automatically reflex in the presence of chemical abnormalities in the macroscopic exam. Microscopic results may provide additional information regarding the status of carbohydrate metabolism, kidney and liver function and urinary tract infection. The method is a visual microscopic examination.

Specimen Collection:

- a) Requirements for patient preparation: none
- b) Specimen type: first morning is preferred but random mid-stream urine in a clean container is acceptable, preservatives not recommended.
- c) Labeling requirements: 2 unique identifiers on primary and all secondary containers (name, DOB, or EMR, SS, phone#)
- d) Storage conditions and limits: room temperature until tested, store at 2-8°C if greater than 2 hours and stored up to 8 hours in refrigerator. This does precipitate crystals.
- e) If referring to outside lab: refer to service manual, forms, etc.
- f) Criteria for rejection: Held at room temperature longer than 2 hours as cells and casts deteriorate over time. Contamination by skin cleanser may affect test results.

Preparation and Storage: Not applicable

Microscopic examination:

- a) Review several fields over the area of the coverslip and average the number of cells per high power field or low power field appropriate for the particular element.
- b) Detection of inadequately prepared slides should be considered if no cellular elements are found.

Calibration: Not applicable

Control procedures

- a) Correlation of microscopic results to macroscopic results.
- b) Quality control for urine microscopic may take the form of an elemental comparison with a urine microscopic chart or reference book pictures. White blood cells, red blood cells, epithelial cells, bacteria, various types of casts and crystals that may be encountered should be included as well as non-pathologic possible contaminants (talc crystals).

Test performance

- a) Pour a sample of well-mixed urine (usually 5-10 ml) in a clean, graduated conical centrifuge labeled test tube.
- b) Centrifuge at a relatively low speed (about 1,500-3,000 rpm) for 5-10 minutes until a moderately cohesive button is produced at the bottom of the tube.
- c) Decant the supernatant and leave a volume of 0.2 to 0.5 ml inside the tube.
- d) Resuspend the sediment in the remaining supernatant by flicking the bottom of the tube several times.
- e) Place a drop of resuspended sediment on a clean glass slide and gently place a coverslip over it by backing one edge into the liquid and then dropping it minimizing bubbles under the coverslip.
- f) Observe under low power (10x) with subdued light for elements present in low numbers such as casts for identification, and then high, dry power (45x) adjusting the diaphragm for proper light to identify elements of WBC, RBC, epithelial cells, casts, bacteria, mucus, crystals, and miscellaneous sediment. Ten to fifteen fields should be scanned under both low and high power and the average number of elements counted and recorded.
- g) Record observed data per high power field (per low power field for casts) as indicated below:
 - WBC: number range/hpf
 - RBC: number range/hpf

Date of Initial Use _____

Date Retired _____

(Retain for 2 years)

- Epithelial cells: occasional (0-2), few (3-9), moderate (10-50), many (>50)/hpf
- Cast: occasional to number range/low power field and type (hyaline, granular, waxy, cellular)
- Mucus: negative, trace, 1+, 2+, 3+, 4+/hpf
- Crystals: few, moderate, many plus type (amorphous, cystine, leucine, tyrosine, cholesterol)
- Bacteria: negative, trace, 1+, 2+, 3+, 4+/hpf
- Yeast: present
- Trichomonas: present
- Glitter cells: few, moderate, many
- Renal epithelial cells or oval fat bodies: number range/hpf
- Note clumps of WBCs and/or RBCs
- Sperm in males

Reportable range

- a) Zero to 50 WBC, RBC, epithelial cells/hpf
- b) It is not necessary to quantify greater than 50 cells/hpf.
- c) Report as >50/hpf.

Limitations

If a specimen sits at room temperature for longer than 2 hours, it can become overgrown with bacteria.

If a moderate amount of epithelial cells are present, the sample may not be considered a clean catch and may need to be re-collected.

Do not report the following artifacts:

1. starch or powder crystals
2. sperm in female samples
3. cloth fibers
4. hair shafts
5. oil droplets
6. air bubbles

Reference Range

- a) WBC: 0-4/hpf
- b) RBC: rare/hpf
- c) Epithelial Cells: occasional/hpf (may be higher in females)
- d) Casts: occasional /lpf hyaline
- e) Bacteria: negative
- f) Mucus: negative to 2+
- g) Crystals: few amorphous

Panic Protocol

- a) Unnecessary for physician performed microscopy procedure (PPMP) certified laboratories as the provider is already notified per definition of PPMP.

References:

- a) Jeff A. Simmerville, M.D., William C. Maxted, M.D., and John J. Pahira, M.D. Georgetown University School Of Medicine, Washington, D.C.; Urinalysis: A Comprehensive Review, American Family Physician, March 15, 2005. (Am Fam Physician 2005; 71:1153-62) <http://www.aafp.org/afp/20050315/1153.html>
- b) Basic Medical Laboratory Techniques, second edition, Norma J. Walters, Barbara H. Estridge, Anna P. Reynolds, Delmar Publishers, Inc., 1990.

Reporting Results

Results are entered into the patient medical record. The physician makes a clinical correlation. Corrected report policy and procedure. Add comment "Previously reported as __ on __ (date)".

Note: Maintain all preliminary, final, corrected reports for 2 years.

Date of Initial Use _____
Date Retired _____
(Retain for 2 years)

Test System Inoperable

- a) Description of the course of action to take if a **test system** becomes inoperable. (Microscope becomes inoperable)
 - a) Refer samples to reference lab
 - b) Call service representative
- b) Description of the course of action to take if **reporting system** (EMR or LIS) becomes inoperable.

Not applicable or

- a) Hold all results until information system is operational
- b) Refer all samples to reference lab
- c) Use backup plan of manual entry and reporting system and delivery

Note: All handwritten changes to procedures will be signed and dated by the laboratory director before being implemented.

Approved

Signature Laboratory Director

Date _____