

SUBJECT: URINE MICROSCOPIC EXAMINATION

Original Date: 2/1997
Effective Date: 2/1997

I. PURPOSE:

The microscopic examination of the urine provides the clinician with valuable diagnostic information regarding renal and/or urinary tract disease. Interpretation of urine sediment requires time, skill, training, and experience.

II. DEFINITION:

Microscopic examination of the urine sediment is performed via wet mounts and brightfield microscopy. Consistency in all aspects of the microscopic examination is essential to the production of meaningful results. Each microscopist must examine the urine sediment using the same criteria for identification and reporting of results.

III. POLICY:

A. GENERAL

1. Physicians, nurse practitioners, nurse mid-wives, physician assistants, dentists and medical and dental students who have documented evidence of training and competency may perform microscopic urine examination.
2. Trained clinical laboratory staff should be consulted when results are in question.
3. The slide materials will be considered contaminated, therefore all users will wear gloves. All contaminated material will be handled and disposed of according to Standard Precautions Guidelines.

B. SPECIMEN

1. Freshly voided urine specimen.
2. The type and quality of the urine specimen affects the results of the microscopic examination. The specimen of choice is the first morning urine. The first morning urine is the most concentrated which increases the recovery of cellular elements. Urine specimens that are held unrefrigerated for more than two hours are not acceptable for microscopic examination. Casts, red blood cells, and white blood cells are susceptible to lysis.
3. Urine must be collected in a clean container and the container must be labeled with the patient's name and medical record # (or other patient-specific identifier) to ensure proper specimen identification.

C. REAGENTS AND EQUIPMENT

1. Microscope

2. Microscope Slide and Coverslip
3. Centrifuge

D. QUALITY ASSESSMENT

There is no suitable quality control material for microscopic urinalysis.

E. RESULT REPORTING AND REVIEWING

1. Report all microscopic findings.
2. Urine microscopics performed, using the approved equipment, by licensed professionals (who qualify as supervisors according to CLIA 88 guidelines) are reviewed at the time of test performance, prior to being transferred to the patient chart. Once the result has been transferred to the chart, it should be reconfirmed by testing personnel.
3. If an error is detected by the licensed professional upon review of the test result, corrective actions must be initiated immediately. The corrective action involves making the correction to the patient chart and initialing it.
4. Point-of-Care testing results that do not correlate with patient condition or are suspect should be followed up by confirmatory testing in the main laboratory.

IV. PROCEDURES:

PROCEDURE A: PATIENT TESTING

Requisites:

Microscopic slides
Cover slips
Centrifuge
Microscope
Gloves

Centrifugation of Urine:

1. Wash hands thoroughly using soap and water.
2. Put on gloves.
3. Agitate the urine in its collection container to stir up any sediment that may have settled to the bottom.
4. Fill a tube with approximately 12 ml of urine.
5. Centrifuge for 5 minutes at 1,500 to 1,800. (Refer to Operator's Manual for centrifuge operation.)
6. Discard most of the supernatant.
7. Resuspend the sediment with the remaining supernatant.
8. Place a drop of the sediment on the slide and cover with a coverslip.

Examination of Sediment

1. Darken the field of microscopy by almost completely closing the diaphragm just beneath the stage.
2. A well darkened field is necessary if hyaline cast are to be found because they are clear, colorless, and have low refractivity.
3. First examine the slide with low power and then with high power.
4. Certain elements are examined and quantitated under low power and certain elements are examined and quantitated under high power.

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|---------------|--|
| a) Low power | <ul style="list-style-type: none"> -Casts -Epithelial cells -Crystals (to quantitate) -Amorphous material -Mucous threads |
| b) High Power | <ul style="list-style-type: none"> -Erythrocytes -Leukocytes -Bacteria and Yeast -Crystals (to identify) |

***Spermatozoa and Trichomonas are reported, but not quantitated.

5. Errors to be avoided:
 - a) Careless transfer of sediment.
 - b) Use of too much light in the microscopic examination.
 - c) Use of high power only.
 - d) Drying of the sediment.
 - e) Dirty equipment.
 - f) Scratches on the slide.

Result Reporting

1. When it is not possible to count the elements the following general equivalents may be used:
 - a) Greater than 100.....LOADED
 - b) 50-100.....NUMEROUS
 - c) Approximately 20-50.....MODERATE (only if not possible to count)
 - d) Approximately 5-20 FEW(only if not possible to count)
2. Terms that are used to describe elements which are not counted:
 - a) BacteriaFew, Moderate, Numerous, Loaded
 - b) Mucus, Amorphous Urates.....Slight, Moderate, Abundant, Loaded
and Phosphates
 - c) Epithelial cells, Crystals,.....Rare, Occasional, Few Moderate, Numerous, Loaded
and Yeast cells

V. APPENDIX:

APPENDIX A: ABOUT THE TEST

Reference Range:

Not applicable

VI. REFERENCES:

Hepler, O., Manual of Clinical Laboratory Methods, C.C. Thomas, Springfield, 4th Edition, 1949, pp. 1-13.

VII. RESOURCES:

Medical College of Virginia Clinical Hematology Laboratory – Department of Pathology