

Clinical Performance Objectives in Urinalysis
Department of Medical and Research Technology
University of Maryland School of Medicine
Spring 2015

Upon completion of the **Urinalysis** experience the MLS student will be able to:

I. LABORATORY SAFETY

1. Comply with the standard operating procedure (SOP) for specimen handling, distribution, and storage including correct triage of specimen for in house and send out laboratory testing. Following departmental protocol, demonstrate safe work practices by:
 - a. Wearing personal protective equipment (PPE) as required.
 - b. Handling and disposing of contaminated materials according to standard precautions.
 - c. Handling chemicals/reagents according to safety procedures.
2. Dispose of waste according to laboratory protocol.

II. SPECIMEN HANDLING

1. Check for correct identification/labeling of specimens according to the current National Patient Safety Standard from TJC.
2. Explain the importance of proper collection and transport of specimens.
3. List criteria for evaluating specimen quality and corrective actions to resolve problems.

III. QUALITY ASSURANCE

1. List substances that will cause false negative and false positive results in a routine urinalysis.
2. Summarize the advantages and disadvantages of commonly used urine preservatives.
3. State the confidentiality policy of the facility during testing procedure and reporting in accordance with HIPAA guidelines.
4. Observe basic computer applications where relevant.

IV. PERFORMANCE OF PROCEDURES

A. Analytical Principles

1. Explain the physiological role of the components of the urinary system.
2. Explain the principle and methodology limitations of refractometry for urine specific gravity.
3. Correlate the origin and significance of the chemical constituents usually found in urine by the multitest reagent strip methodology to include:
 - pH
 - Protein
 - Glucose
 - Ketone
 - Bilirubin
 - Blood
 - Nitrite
 - Urobilinogen
 - Specific gravity
4. Explain the principle and methodology limitations of each test on the multi-test reagent strip.
5. Discuss the significance of the confirmatory tests used in the chemical analysis of urine, i.e., icotest, sulfosalicylic acid, clinitest, acetest.
6. Explain the principle and methodology limitations of each of the following confirmatory tests: icotest, sulfosalicylic acid, clinitest, acetest.
7. Explain the principles of bright field, phase contrast, and polarized microscopy.

B. Maintenance

1. Perform routine maintenance checks.
2. Describe the various periodic maintenance procedures for the different instruments and maintenance sheets.

C. Quality Control and Calibration

1. Perform quality control analysis in the urinalysis laboratory.
2. Evaluate, with 100% accuracy, quality control results from a minimum of 10 days of testing.

3. Perform or discuss corrective action needed to be taken if quality control values are not within established limits.
4. Report or record quality control results according to the standard operating procedures of the laboratory with 100% accuracy.

D. Testing of Samples

1. For a minimum of 2-5 urine specimens with 95% accuracy:
 - a. Describe the physical appearance.
 - b. Perform specific gravity analysis using the refractometer and/or dipstick methods.
 - c. Observe and review chemical analysis of urine specimens whether performed by an instrument or manually.
 - d. Interpret results obtained from chemical analysis.
 - e. Where applicable, confirm abnormal results with appropriate confirmatory tests for a minimum of 5 different abnormal urine specimens.
 - f. Interpret the confirmatory test results.
 - g. Perform microscopic analysis on urine specimens according to the standard operating procedure of the laboratory to the satisfaction of the clinical liaison.
 - h. Given a specimen or electronic images, identify normal and abnormal constituents in a microscopic analysis of urine specimens with 95% accuracy. These constituents include:
 - Erythrocytes
 - Leukocytes
 - Epithelial cells: squamous, transitional, renal
 - Bacteria
 - Yeast
 - Casts: hyaline, fine and coarse granular, rbc, wbc, waxy
 - Crystals: uric acid, calcium oxalate, triple phosphate, tyrosine, cystine, ammonium biurate
 - Oval fat bodies

- Contaminants: fibers, talc, glass, etc.
2. Operate automated dipstick readers, where available, with 100% accuracy.
 3. For the following procedures, it is essential that the student receive hands-on experience and perform with 95% accuracy in whichever department the procedure is performed:
 - a. Cerebrospinal fluid analysis to include cell count, differential, chemistry
 - b. Fecal occult blood
 - c. Urine/serum pregnancy test
 4. Recognize cells specific to each body fluid type to include histiocytes, mesothelial cells, malignant cells, macrophage with inclusions, crystals, yeast, bacteria and others.
 5. Discuss or perform body fluid analysis on synovial, serous, and other fluid when available.

V. Interpretation and Reporting of Results

1. State the reference (normal) values for all routine assays performed in the urinalysis laboratory.
2. With 95% accuracy, correlate quantitative data with microscopic data.
3. Correlate abnormal results with associated common disease states.
4. Interpret the results obtained from performing body fluid analysis on synovial, serous, and other fluids when available.
5. Report all divergent or discordant results between quantitative and microscopic data to the clinical instructor.
6. Recognize all critical values and report these findings to the clinical instructor.