Clinical Performance Objectives in Clinical Chemistry
Department of Medical and Research Technology
University of Maryland School of Medicine
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Upon completion of the Clinical Chemistry rotation the 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.
2. Demonstrate safe work practices following departmental protocol by the following
   a. Wearing personal protective equipment (PPE) as required.
   b. Handling and disposing of contaminated materials according to standard precautions.
   c. Handling chemicals according to safety procedures.
3. 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 JCAHO.
2. Identify specimens that may be unsuitable for analysis due to incorrect anticoagulant used, sample volume and age, hemolysis, lipemia, icteric, clot, and/or air bubbles present.
3. Evaluate specimens for appropriate anticoagulant, collection time, and site of collection.
4. Explain corrective measures for unacceptable specimens.
5. Prepare a minimum of 20 specimens for analysis by centrifugation and separation of cells from serum/plasma.
6. Describe the process for archiving and retrieving patient specimens including the correct specimen storage requirement for each specimen type.

III. Quality Assurance

1. Explain the purpose of the quality control program.
2. Document results of calibration, performance, and maintenance checks, **malfunctions, and corrections without error**.
3. Observe basic LIS computer applications where relevant.
4. Comply with regulatory issues.
5. State the confidentiality policy of the facility during testing procedures and reporting according to HIPAA guidelines

IV. Performance of Procedures

A. Analytical Principle

1. Observe the sample path or flow in 2 instruments.
2. Discuss the theoretical principles for each analytical methodology.
3. Recognize common malfunctions of the instruments.
4. Recognize interfering substances for each procedure performed.
5. Describe the effect of interfering substances for each procedure performed.
6. Define the following methodologies:
   - End-point spectrophotometry
   - Kinetic spectrophotometry
   - Ion-selective electrodes
   - Osmometry
   - Electrophoresis
   - Chemiluminescence
   - Immunoassay
   - Fluorescent polarization
7. Classify 20 different assays to their methodologies.

B. Maintenance

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

C. Reagent Preparation

1. Prepare reagents, calibrators, and control material within the acceptable QC limits for10 different assays.
2. Pipet reagents and samples correctly.

D. Quality Control and Calibration

1. Perform calibrations.
2. Evaluate the validity of the standardization/calibration of the instrument.
3. With 100% accuracy, identify all control results that are not within the accepted quality control limits.
4. State possible reasons, if QC results are not within the limits (e.g. outside instrument limitations)
5. Discuss appropriate actions for unacceptable control results.
6. Observe documentation of corrective actions for unacceptable control values.

E. Testing of Samples

1. Prepare dilutions with 100% accuracy**.**
2. Complete a minimum of 10 runs/assays with acceptable results and within the laboratory's timeframe specified for stat and/or routine turn-around time.
3. Operate at least one analyzer with minimal supervision in accordance with laboratory protocol.
4. Demonstrate the ability to organize workflow.
5. Describe or demonstrate basic trouble-shooting skills for the common malfunctions.

V. Interpretation and Reporting of Results

1. Recognize serum reference intervals and critical values for the following tests:

Glucose	Blood urea nitrogen
Total protein	Creatinine
Sodium	Total bilirubin
Potassium	Cholesterol
Chloride	Blood gases

Therapeutic drugs (peak and trough)

2. Identify all patient values that are significantly different (e.g. risk values, critical values, analytical errors) and bring these to the attention of the technologist immediately.
3. According to the laboratory protocol document investigative and corrective action for discrepant results.
4. Determine need for repeat analysis on unacceptable reportable ranges.
5. Determine whether results fit the expected pattern with respect to previously obtained results on same test or other test results on same patient.
6. Evaluate a minimum of 50 patient results according to laboratory protocol.
7. Perform and interpret 10 routine calculations to include dilutions, anion gap, 24-hour urine, creatinine clearance, LDL, and thyroid index with 100% accuracy**.**
8. Correlate laboratory data with clinical implications with 70% accuracy. This includes:
    - Cardiac enzymes
    - Liver enzymes
    - Bilirubin
    - Protein
    - Glucose
    - Electrolytes
    - Tumor markers
    - Drugs of Abuse
    - Creatinine
    - Blood gases
    - Iron
    - Lipids
    - Endocrine function
    - Blood urea nitrogen
    - Therapeutic Drugs
9. State the difference between the analytical measurement range (AMR) and clinically reportable range (CRR).
10. Correlate abnormal test results to possible disease states with 80% accuracy.

VI. Professional Qualities

1. Arrive at the laboratory on time.
2. Adhere to the established student uniform policy.
3. Notify the clinical supervisor of any unavoidable absences prior to the scheduled arrival time and make arrangements to make up the time on a mutually convenient date.
4. Demonstrate the ability to follow verbal and written instructions.

5. Communicate in a constructive, professional manner (i.e. polite, considerate, pleasant and unhurried) with members of the laboratory and hospital staff, peers and patients.

6. Organize work in a logical sequence.

7. Complete work and assignments within established deadlines.

8. With the approval of the clinical instructor, demonstrate the initiative to perform tasks without being reminded.

9. Demonstrate constructive utilization of all training time by examining available study materials during periods of time not devoted to instruction.

10. Demonstrate flexibility in changes to the scheduled daily learning activities due to laboratory staffing, emergencies, etc.

11. Demonstrate the ability to recognize and admit mistakes or discrepancies and take appropriate corrective measures, including seeking help when needed.

12. Demonstrate the ability to accept professional constructive criticism regarding work.

13. Maintain the confidentiality of all patient information when questioned by patients or other unauthorized individuals.

14. Adhere to all published safety regulations in the laboratory.

15. Demonstrate professionalism in attitude, appearance and work ethic 100% of the time.