CONCEPT

Medical Laboratory Techniques: Clinical Biochemistry, Haematology and Microbiology

5 – 9 September 2027
Riyadh - KAFD district five-star



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Ref: 652_18424 **Date:** 5 – 9 September 2027 **Location:** Riyadh - KAFD district five-star **Fees:** 20000 SAR

Introduction:

Medical laboratory techniques decide whether a potassium, a platelet count or a blood culture isolate reaches the ward as a true value or as an artefact of haemolysis, clumping or a mixed plate. This Core Concept course takes bench technologists through specimen integrity, photometric and ion-selective electrode chemistry, enzyme assays and serum index interferences, cell counter principles, blood film morphology, clotting assays, culture, isolate identification and susceptibility reading, then delta checks and critical value calls. Participants compile a Result Verification and Troubleshooting Casebook for a case hospital laboratory.

Course Objectives:

- Recognise specimen integrity defects such as haemolysis, EDTA carry-over, clotted tubes and delayed separation before an examination is run
- Perform calibration checks and run photometric, ion-selective electrode and enzyme kinetic assays on a clinical chemistry analyser, identifying serum index interferences
- Interpret CBC parameters, red cell indices and cell counter flags and decide when a peripheral blood film review is required
- Carry out prothrombin time, APTT, fibrinogen and D-dimer testing and resolve pre-examination causes of spurious clotting results
- Process microbiology specimens through Gram stain, culture media selection, isolate identification and disk diffusion or MIC susceptibility reading
- Apply delta checks, plausibility limits and critical value calls when verifying patient results for release

Target Audience:

- Bench staff responsible for operating clinical chemistry and immunoassay analysers and releasing chemistry results
- Haematology and coagulation bench staff responsible for cell counts, blood film reading and clotting assays
- Microbiology bench staff responsible for specimen plating, culture reading, isolate identification and susceptibility testing
- Rotating and newly qualified laboratory scientists responsible for covering several sections on shift and night duty
- Specimen reception and processing staff responsible for centrifugation, aliquoting and sample integrity checks

Course Outline:

Day 1: Specimen Integrity and Bench Workflow Across Laboratory Sections

- Hospital Laboratory Sections Map: Chemistry, Haematology, Coagulation and Microbiology Benches
- Tube Additives, Order of Draw and Anticoagulant Effects on Bench Results
- Centrifugation Speed, Separation Delay and Analyte Stability Tables
- Visual and Index-Based Sample Assessment: Haemolysed, Icteric, Lipaemic and Clotted Tubes
- Bench Workload Audit Sheet for Sample Defects Found per Shift

Day 2: Clinical Chemistry Analysers, Calibration and Serum Assays

- Photometry, Endpoint and Kinetic Reactions on Automated Chemistry Platforms
- Calibrator Traceability, Calibration Curves and Reagent Lot Change Checks
- Ion-Selective Electrode Measurement of Sodium, Potassium and Chloride with Bicarbonate
- Renal and Hepatic Panel Assays: Urea, Creatinine, Bilirubin, ALT, AST and ALP
- HIL Serum Indices, Pseudohyperkalaemia and Immunoassay Hook and Heterophile Effects

Day 3: Haematology Cell Counters, Blood Films and Coagulation Testing

- Impedance Counting and Light Scatter Flow Cytometry Principles in Cell Counters
- CBC Parameters and Red Cell Indices: HGB, HCT, MCV, MCH, MCHC and RDW
- Five-Part Differential Flags, Immature Granulocytes and NRBC Correction
- Peripheral Blood Film Preparation, Romanowsky Staining and Morphology Grading
- Prothrombin Time, INR, APTT, Fibrinogen and D-Dimer Bench Procedures

Day 4: Microbiology Culture, Susceptibility Testing and Result Verification

- Microbiology Specimen Processing: Gram Stain, Plating Streaks and Culture Media Choice
- Isolate Identification by Biochemical Panels and Automated Identification Systems
- Disk Diffusion Zone Reading, Broth Microdilution MIC and S/I/R Breakpoint Interpretation
- Biosafety Cabinet Use, Aerosol Control and Sharps Handling at the Microbiology Bench
- Delta Check Thresholds, Plausibility Limits and Critical Value Telephone Call Log

Day 5: Casebook Build: Result Verification and Troubleshooting for a Case Hospital

- Case: Spurious Hyperkalaemia from Haemolysis and EDTA Contamination
- Case: Platelet Clumping, Cold Agglutinin and Falsely Raised MCV on a Cell Counter
- Case: Prolonged Clotting Times from an Underfilled Citrate Tube
- Case: Mixed Blood Culture Growth and an Unexpected Resistance Pattern
- Result Verification and Troubleshooting Casebook Presentation and Peer Challenge

Skills You Will Gain:

- Sample Integrity Screening
- Analyser Calibration Checking
- Electrolyte and Enzyme Assay Troubleshooting
- Cell Counter Flag Interpretation
- Blood Film Morphology Reading
- Coagulation Assay Troubleshooting
- Antimicrobial Susceptibility Reading
- Delta Check Result Verification

Why Attend This Course:

- Return with a Result Verification and Troubleshooting Casebook covering chemistry, haematology, coagulation and microbiology cases
- Spot artefactual results such as pseudohyperkalaemia or clumped platelets before they reach the clinician
- Cover chemistry, haematology and microbiology benches on shift with a consistent verification routine
- Compare bench practice with peers from hospital, reference and private laboratories

Conclusion:

A laboratory result is only as sound as the specimen, the method and the person who verifies it at the bench. The course moves from specimen integrity and separation through chemistry analyser calibration, electrolytes, enzymes and serum index interferences, to cell counter principles, CBC indices, blood film review and clotting assays, then culture, isolate identification, susceptibility reading, bench biosafety and delta checks. The final day applies these methods to real bench cases and produces a Result Verification and Troubleshooting Casebook for a case hospital laboratory.