JUPITER PRIME

Consulting • Training • Advisory

جوبيتر برايم للاستشارات والتدريب

COURSE BROCHURE

Advanced Medical Laboratory Quality and Operations Training Course

23 May – 3 June 2027
Muscat

jupiterprime.uk

info@jupiterprime.uk

Registered in the United Kingdom and Saudi Arabia

Advanced Medical Laboratory Quality and Operations Training Course

Ref: 801_30428 **Date:** 23 May – 3 June 2027 **Location:** Muscat **Fees:** 9900 GBP

Medical Laboratory Quality and Operations is a 2-week training course for laboratory managers, senior scientists and quality officers who run clinical testing services and want to leave with a laboratory quality and operations improvement plan. Testing volumes, staffing pressure and clinician expectations of faster, safer results are rising together, so every specimen journey now needs tighter control. Jupiter Prime Training delivers medical laboratory quality and operations with a focus on decisions at the bench and the board.

Why Medical Laboratory Quality and Operations Matters Now

Three forces shape the clinical laboratory today: clinicians who act on results within minutes in emergency and critical care, automation and middleware that move more specimens with fewer hands, and patients who expect accurate reports at every point of care. A laboratory that controls its pre-analytical phase, statistical quality control and turnaround times protects diagnosis and treatment decisions; one that does not risks misdiagnosis, repeat collections and lost confidence from wards and referring clinics. The course rests on recognised international laboratory quality and biosafety standards, described in general terms, together with Statistical Quality Control SQC rules and Lean flow methods.

Who Gains Most from Medical Laboratory Quality and Operations

- Leaders responsible for the daily running of a hospital or reference laboratory and its workflow
- Senior scientists accountable for analyser performance, calibration and method verification
- Quality officers who own internal quality control, proficiency testing and corrective actions
- Section heads in chemistry, haematology, microbiology and blood transfusion
- Specialists who configure and maintain laboratory information and middleware systems

Laboratories gain most when a manager, a quality officer and a section head attend together and agree one improvement route for their service.

Medical Laboratory Quality and Operations Capabilities

Participants turn bench-level quality signals into service decisions that clinicians, auditors and finance colleagues can trust.

- Design pre-analytical controls for specimen collection, labelling and transport — ward managers and phlebotomy leads
- Apply Westgard multirule quality control and sigma metrics — release or hold decisions on patient results
- Assess external quality assessment reports and trend bias — corrective action owners
- Specify method validation and verification studies for new assays — laboratory directors approving go-live
- Calculate turnaround time performance by test and priority — clinicians in emergency and critical care
- Build biosafety risk assessments for laboratory sections — occupational health and facilities teams

Key Medical Laboratory Quality and Operations Terms

- Pre-analytical phase — every step from test request and patient preparation to specimen arrival at the analyser, where most laboratory errors begin.
- Internal quality control IQC — routine testing of control materials alongside patient samples to confirm an analytical run is fit to report.
- External quality assessment EQA — independent comparison of a laboratory's results on shared samples against peer laboratories to reveal bias.
- Sigma metric — a score combining allowable total error, bias and imprecision that shows how robust an assay is.
- Turnaround time TAT — the elapsed interval from request or specimen receipt to result release, measured by test and priority.
- Laboratory information system LIS — software that manages orders, specimens, results, auto-verification rules and audit trails across the laboratory.

Medical Laboratory Quality and Operations Day by Day

Day 1: The Laboratory in the Clinical Pathway

- Total Testing Process Map — Where Laboratory Errors Affect Patient Care
- Clinician Expectations Survey — Setting Service Priorities With Wards
- Laboratory Quality Management System Structure — Scope Of Documented Processes
- Quality Indicator Set — Choosing Measures For Board Reporting
- Laboratory Service Risk Register — Ranking Threats To Result Integrity

Day 2: Controlling the Pre-Analytical Phase

- Specimen Rejection Criteria — Balancing Sample Quality Against Recollection Burden
- Patient Identification And Labelling Checks — Preventing Wrong Blood In Tube
- Specimen Transport And Stability Rules — Pneumatic Tube And Courier Decisions
- Haemolysis And Interference Indices — Automated Flags For Result Comments
- Phlebotomy Training Audit — Targeting Wards With High Error Rates

Day 3: Statistical Quality Control at the Bench

- Levey-Jennings Charts — Visualising Control Drift And Shifts
- Westgard Multirule Selection — Release Or Reject Analytical Runs
- Sigma Metric Calculation — Matching QC Frequency To Assay Robustness
- Control Material Selection — Third-Party Versus Manufacturer Controls
- Patient-Based Real-Time Quality Control — Moving Averages Between Control Runs

Day 4: External Quality Assessment and Peer Comparison

- EQA Scheme Selection — Covering Every Reported Analyte
- Bias And Z-Score Interpretation — Deciding When Results Need Investigation
- Root Cause Investigation Of EQA Failures — Method, Reagent Or Operator
- Inter-Laboratory Comparison For Rare Tests — Alternatives Where No Scheme Exists
- Corrective And Preventive Action Log — Closing Findings With Evidence

Day 5: Method Validation and Verification

- Precision And Trueness Studies — Accepting A New Analyser Or Assay
- Method Comparison With Bland-Altman Plots — Switching Platforms Safely
- Measurement Uncertainty Estimation — Communicating Result Reliability To Clinicians
- Reference Interval Transference — Adopting Ranges For Local Populations
- Allowable Total Error Goals — Setting Acceptance Limits Per Analyte

Day 6: Laboratory Information Systems and Data Integrity

- LIS Order And Result Workflow Mapping — Removing Manual Transcription Steps
- Auto-Verification Rule Design — Releasing Normal Results Without Delay
- Delta Checks And Critical Value Alerts — Escalating Results To Clinicians
- Middleware And Analyser Interfaces — Validating Data Transfer Before Go-Live
- Audit Trail And Access Control Review — Protecting Patient Result Records

Day 7: Turnaround Time and Laboratory Flow

- Turnaround Time Measurement By Priority — Defining Targets With Emergency Departments
- Value Stream Mapping Of Specimen Flow — Locating Queues And Batching Delays
- Point-Of-Care Testing Oversight — When To Test Outside The Laboratory
- Staff Rostering Against Workload Peaks — Matching Shifts To Specimen Arrivals
- Visual Management Boards — Daily Huddles On Outstanding Specimens

Day 8: Biosafety and Laboratory Risk Control

- Biological Risk Assessment By Section — Choosing Containment And Protective Equipment
- Biological Safety Cabinet Checks — Certification Intervals And Use Practice
- Spill And Exposure Response Drills — Preparing Staff For Incidents
- Clinical Waste Segregation — Decontamination And Disposal Routes
- Chemical And Sharps Hazard Inventory — Reducing Exposure In Busy Benches

Day 9: Leading Laboratory Performance and Audit

- Internal Audit Schedule — Vertical And Horizontal Audit Techniques
- Competency Assessment Framework — Authorising Staff For Each Test
- Document Control And Standard Operating Procedures — Keeping Methods Current
- Reagent And Consumable Inventory Control — Avoiding Stock-Outs And Expiry
- Cost Per Reportable Result — Weighing Automation Against Manual Testing

Day 10: Practising the Laboratory Improvement Plan

- Pre-Analytical Error Baseline — Applying Rejection Data To Priorities
- QC And EQA Performance Review — Selecting Assays For Rule Changes
- TAT And Flow Findings — Sequencing Workflow Changes By Impact
- Biosafety And Audit Gaps — Assigning Owners And Review Dates
- Laboratory Quality And Operations Improvement Plan — Presenting To Hospital Leadership

Applying Medical Laboratory Quality and Operations After the Course

- Run a four-week pre-analytical error audit with two high-volume wards and agree rejection criteria with their nurse managers.
- Calculate sigma metrics for the ten highest-volume assays and adjust Westgard rules and control frequency for each.

Medical Laboratory Quality and Operations Questions FAQ

What is medical laboratory quality and operations, and why does it matter now?

It is the discipline of controlling every step of clinical testing, from specimen collection to result release. It matters now because faster clinical decisions, automated analysers and higher volumes make undetected errors and slow results more costly for patients and hospitals.

Which roles gain most from medical laboratory quality and operations training?

Laboratory managers, senior scientists and quality officers gain most. Section heads and LIS specialists also benefit, because quality control, validation and flow decisions depend on their analysers, data and staff working to the same rules.

How does medical laboratory quality and operations differ from a general healthcare quality course?

It focuses on the testing process itself rather than hospital-wide quality. You work with control charts, EQA reports, validation statistics, LIS rules and biosafety assessments, which general healthcare quality and accreditation courses treat only briefly.

What do you bring back from medical laboratory quality and operations training?

You bring back a laboratory improvement plan built on your own error, QC and turnaround data. It ranks changes by patient impact, names owners, and gives hospital leadership a clear view of where the laboratory stands.

Medical Laboratory Quality and Operations: The Way Forward

The laboratory quality and operations improvement plan first informs which pre-analytical and QC changes to fund in the coming quarter. Laboratory managers use it with quality officers and ward leaders, and hospital executives use it to track service risk. After its first cycle, revisit sigma metrics and turnaround targets, since new analysers, test menus and clinical pathways shift where the laboratory adds the most value.