REPUBLIC OF KENYA

MINISTRY OF HEALTH

THE KENYA MEDICAL LABORATORY TECHNICINS ASND TECHNOOGISTS BOARD.

REGULATORY GUIDELINES FOR PRACTICAL ROTATIONS OF MEDICAL LABORATORY SCÆNCES STUDENTS.

Pursuant to the Medical Laboratory Technicians and Technologist or officer student or officer students Act CAP 253 .A Laws of Kenya.

KMLTTB QUALITY ASSURANCE SERVICES.

	STANDARD OPERATING PROCEDURES FOR PRACTICAL DEMONSTRATIONS OF MEDICAL LABORATORY SCIENCES STUDENTS		DOCUMENT CONTROL Serial: KMLTTB/PRACTICAL/GUIDE/01
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A. INTRODUCTION

In accordance with CAP 253A laws of Kenya section 5. The mandate of KMLTTB is to exercise general supervision and control over the training business, index number to be a medical laboratory sciences student and institutions of Medical laboratory technicians and technologist or officer student or officer students Kenya and to advise the government on all matters thereof. The board also oversees the Validation of in vitro diagnostics.

Professional index number to be a medical laboratory sciences student in the health sector requires consistent and ongoing commitment from all concerned to the lifelong learning philosophy in order to update and develop the knowledge, skills and ethical attitudes that underpin competent index number to be a medical laboratory sciences student. This perspective protects the public interest and promotes the health of all members of the Kenyan society. Guided by the principle of beneficence, medical laboratory sciences profession aspires to standards of excellence in health care provision and delivery.

The medical laboratory sciences students training attachment is a mandatory requirement, which aims at exposing the trainee to real medical laboratory analysis and investigations situations. The trainee shall be attached to an organization and be a part of the workforce. It is hoped that by doing so he/she shall acquire professional experience and relevant skills. By identifying problems, and working out their solutions the trainee shall learn the decision making process that would best lead to effective recognition and response to health problems and enhance sustainable development.

B. POLICY STATEMENT

This policy establishes the procedures for the standardized and safe medical laboratory sciences students' practical rotation in hospital laboratories to ensure the quality and validity of diagnostic test results and to protect the safety of patients and healthcare workers. Strict compliance with these procedures is mandatory.

Subsequently, the Board endorsed students' practical rotation as the means for maintaining and imparting professional competence in order to ensure that the public interest will always be promoted and protected, as well as ensuring the best possible service to the community. The purpose of students' practical rotation is not only to acquire new knowledge and skills, but also to improve attitude and ultimately the competency of the medical laboratory students and professionals with an end benefit to the client/citizens.

C. TARGET AUDIENCE:

This document is aimed to ensure that all players (medical laboratory sciences students, staff, health workers/professionals and trainers) who perform, participate or supervise MLS students in both the private and public health care facilities, including those involved in home-based care; Health trainers and educators quire MLS knowledge, skills and attitudes.

D.SCOPE:

This policy applies to all medical laboratory personnel who perform specimen collection, specimen analysis, investigations, reporting, interpretation and validation results dispatch. Medical laboratory sciences professionals work including laboratory based disease surveillance, point of care testing (**POCT**) shall exclusively be performed by medical laboratory sciences professionals indexed by KMLTTB.

The trainees shall be attached to institutions, organizations and projects and be allocated tasks. He/she should perform the assignment to the expected standards in order to realize the goal and mission of the host organization and the Kenya Medical Laboratory Technicians and Technologist or officer student or officer student Board.

E. OBJECTIVES:

The overall goal of the field attachment is to expose the trainees to actual medical laboratory sciences health issues and problems in the field and how they are managed. Practical rotations for Medical Laboratory Science (MLS) students are designed to bridge the gap between classroom theory and real-world clinical index number to be a medical laboratory sciences student. These rotations are mandatory for graduation and professional licensure in many jurisdictions.

F. CORE AREAS OF ROTATION:

Students typically rotate through all major departments of a professional medical laboratory sciences to gain entry-level competency.

I. Hematology & Hemostasis:

Examining blood smears for morphology, performing Complete blood counts, and conducting coagulation tests, perform manual and automated differentials, identifying all stages of red and white blood cells, as well as evaluating red blood cell indices (MCV, MCH, MCHC, RDW),identify and characterize normal and pathological blood cells (e.g., anemia, leukemia) using microscopy,ompetently execute routine tests such as Complete Blood Counts (CBC), Reticulocyte counts, and Erythrocyte Sedimentation Rates (ESR),conduct daily start-up, routine maintenance, and troubleshooting for automated hematology analyses, explain the mechanisms of the coagulation cascade and the fibrinolytic system, perform and interpret results for Prothrombin Time (PT/INR),

Activated Partial Thromboplastin Time (aPTT), and Fibrinogen assays, associate laboratory findings with clinical data to identify bleeding or thrombotic disorders, gain exposure to (and often perform) factor assays and D-dimer testing, ensure high-quality patient care, perform, evaluate, and document quality control data to detect and correct testing errors, recognize collection errors such as hemolysis or incorrect anticoagulants (e.g., blue-top tube fill volume),adhere to safety standards and governmental guidelines (.KMLTTB, ISO15189)
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II. Clinical Chemistry,

Learning to process patient samples (metabolic panels, electrolytes) using automated instrumentation and manual methods. **Instrument Operation:** Competence in operating, calibrating, and performing maintenance on automated chemistry analyzers, spectrophotometers, osmometers, pH meters, and electrochemistry analyzers.

III. Methodology Proficiency,

Ability to perform various techniques including electrophoresis, immunoassay, densitometry, and photometry.

IV. Sample Processing,

Proficiency in handling and analyzing serum, plasma, urine, cerebrospinal fluid (CSF), and other bodily fluids, including recognizing pre-analytical errors such as hemolysis or lipemia.

G.ANALYTICAL AND DIAGNOSTIC KNOWLEDGE

- **Test Interpretation,**

  Understanding the physiological basis of tests related to metabolic, endocrine, lipid, carbohydrate, and enzyme functions.

- **Clinical Correlation,**

  Ability to correlate lab data with patient symptoms and known, typical disease patterns (e.g., Diabetes, Cardiovascular Disorders, Acute/Chronic Pancreatitis),routine analysis of electrolytes (Na+, K+, Cl-), BUN/Creatinine, Glucose, Liver Function Tests (LFTs), Lipid Panels, and Blood Gases, ability to use Westgard rules, analyze Levey-Jennings charts, determine QC target values, and take corrective action when controls fail, ability to identify causes for erroneous results, such as reagent issues, calibration errors, or instrument malfunction, validating test results against patient history, previous data (delta checks), and critical limits, performing dilutions, unit conversions (e.g., mass to molar units), calculating

clearances (e.g., creatinine), and anion gas, utilizing computer systems for data entry, retrieval, and reporting, communicating STAT and critical values to clinicians in a timely and accurate manner, adherence to OSHA and KMLTTB guidelines, including proper handling of biohazardous samples, maintaining patient confidentiality and following professional codes of conduct.

I. Microbiology,

Culturing and identifying bacteria, fungi, or viruses and learning safety protocols for isolation rooms, proper collection, transport, and processing of clinical specimens to maintain viability of organisms and ensure accuracy, proficiency in light microscopy, including Gram staining and other specialized stains for bacterial and fungal identification, identifying medically relevant bacteria using phenotypic methods, biochemical tests, and, where applicable, rapid diagnostic tools, performing and interpreting tests to determine the susceptibility of pathogens to antimicrobial agents, applying modern molecular techniques (e.g., PCR) for rapid identification of pathogens, implementing and maintaining rigorous QC protocols to ensure laboratory accuracy and reliability.

II. Virology,

Molecular techniques (PCR, qPCR) for viral detection, viral culture methods, and serological assays to identify antigens and antibodies, medical laboratory biosafety guidelines, quality control, and assurance, which are critical when handling infectious viral agents, ability to identify medically relevant viruses, understand disease mechanisms, and apply diagnostic tests to clinical samples.

III. Mycology,

Fungal morphology, reproduction, and colony characteristics, knowledge of antifungal therapies, resistance mechanisms, and the clinical significance of fungal infections, familiarity with emerging molecular methods for identification (e.g., PCR, sequencing).

IV. Parasitology,

Identifying parasites in various human samples (e.g., blood, stool, and tissues), performing diagnostic tests and understanding laboratory operations, including quality control, applying knowledge of the life cycles and morphology of parasites to make accurate identifications.

V. Entomology,

Learning to survey and identify vectors in their natural habitats, culturing vectors, analyzing pathogen transmission, and testing insecticide resistance, developing methods for reducing insect breeding sites.

VI. Blood Bank (Blood Transfusion Medicine/ Sciences),

Observing the preparation, storage, and cross-matching of blood products for transfusions, performing ABO/Rh forward and reverse typing, detecting clinically significant antibodies using methods like LISS (Low Ionic Strength Solution) or PEG (Polyethylene Glycol), performing crossmatches (immediate spin, AHG) to ensure safe transfusion., interpreting results to detect in vivo coating of red cells, understanding which components (packed red cells, platelets, plasma) are suitable for specific clinical conditions, operating, calibrating, and troubleshooting automated blood bank analyzers (e.g., Ortho VISION, Immucor Galileo NEO), adhering to Kenyan guidelines for blood bank safety, proper storage, rotation, and tracking of blood components to ensure quality.

VII. Immunology & Serology:

Performing diagnostic tests related to the immune system, ability to perform manual and automated tests, including agglutination methods, enzyme-linked immunosorbent assays (ELISA), western blot, and fluorescent assays, correct collection, processing, and handling of serum and other body fluids for serological testing, operating and maintaining lab equipment such as centrifuges, pipettes, and automated analyzers,implementing quality control (QC) procedures, interpreting QC data, and performing corrective actions when results are outside of accepted ranges,associating laboratory findings with clinical data to assess immune status (e.g., in autoimmune diseases, infectious diseases, or transplantation),understanding antigens, antibodies, immunoglobulin classes (IgG, IgM, etc.), and innate/adaptive immunity, principles of precipitation, agglutination, and labeling techniques, clinical understanding of syphilis, viral hepatitis, HIV, streptococcal infections, and autoimmune disorders (e.g., SLE, rheumatoid arthritis),strict adherence to laboratory safety, biosafety, and biohazard containment.

VIII. Histology & Cytology:

Preparing tissue sections and cellular samples for microscopic examination, properly receiving, labeling, and logging patient samples, understanding and performing tissue fixation methods to preserve samples, correctly orienting tissue samples in paraffin wax blocks, cutting thin (micrometer range) tissue sections using a microtome or cryostat, performing Hematoxylin and Eosin (H&E) staining, applying special stains (e.g., PAS, Alcian Blue, Giemsa) to highlight specific tissue components or microorganisms, utilizing light microscopy to examine cells for abnormalities in size, shape, or colour, preparing Pap smears, fluid samples, and Fine Needle Aspirations (FNAs), evaluating slide quality and identifying artifacts from fixation or processing., adhering to medical laboratory safety

standards, including chemical hygiene and handling biohazardous waste, operating and performing maintenance on tissue processors, embedding centers, and automated stainers.

IX. Phlebotomy & Specimen Processing:

Practicing venipuncture techniques and proper sample handling, ability to perform blood draws using evacuated tube systems (ETS), syringes, and winged infusion sets (butterfly needles) on adult and geriatric patients, proficiency in performing finger sticks or heel sticks, knowledge of the correct order of draw to prevent cross-contamination of additives, skills in centrifugation, serum/plasma separation, aliquoting, and ensuring proper storage temperatures, strict adherence to protocols for positive patient identification and immediate, accurate labeling of specimens to prevent errors, strict compliance with OSHA standards, PPE usage, and biohazard waste disposal, ability to handle, label, and process specimens such as urine, stool, or sputum.

X. Mortuary:

Mastering techniques to slow down decomposition, including vascular and cavity embalming, and the proper handling of chemicals, reconstructing and restoring the appearance of the deceased for viewing, requiring attention to detail and artistic ability, understanding human body systems and the effects of disease to ensure safe and respectful handling of human remains, maintaining high standards of sanitation in the laboratory/morgue to protect professionals and the public, including handling sharps and hazardous waste, coordinating funeral arrangements, managing documentation (death certificates), and adhering to legal, ethical, and cultural requirements, providing empathetic support to bereaved families.

H. ATTENDANCE AND DURATION

- **Time Commitment:**

  Rotations generally last between **12 to 16 weeks**. Students are typically on-site for **8 hours a day, five days a week**.

- **Strict Attendance:**

  Most programs have a low tolerance for absences. For example, some disqualify students from exams if they miss more than 25% of the rotation.

- **Makeup Time:**

  Students are often required to make up any missed time before completing the course.

I. STUDENT RESPONSIBILITIES & CONDUCT

- **Documentation:**

  Students must maintain an **official KMLTTB logbook** to record daily activities, instrumentation used, and tests performed.

- **Professionalism:**

  Students must treat the rotation as a "full-time job interview," maintaining punctuality, wearing appropriate scrubs and ID tags, and adhering to ethical standards.

- **Supervision:**

  All tests must be performed under the direct supervision of a certified Medical Laboratory Scientist.

J. SAFETY AND HEALTH REQUIREMENTS

- **Personal Protective Equipment (PPE):**

  Full-length lab coats, gloves, and safety goggles are mandatory.

- **Infection Control:**

  Students must follow universal precautions, assuming all biological samples are potentially infectious.

- **Prerequisites:**

  Before starting, students usually must provide proof of **immunizations** (e.g., Hepatitis B), undergo background checks.

- **Emergency Protocols:**

  Familiarization with the location of eyewash stations, safety showers, and fire extinguishers is required.

K. EVALUATION AND GRADING

- **Competency Checklists:**

  Preceptors evaluate students on technical skills (accuracy, precision) and affective behaviors (cooperation, initiative).

- **Grading:**

A passing grade (often a "C" or at least 70%) is typically required for both the practical and theoretical components of the rotation to qualify for graduation.

L. THE PRACTICUM SHALL FULFILL THE FOLLOWING SPECIFIC OBJECTIVES:

1) Expose the trainee to actual medical laboratory sciences issues and problems.
2) Offer the trainee an opportunity to acquire and apply skills that would enable him/her deal with medical laboratory sciences issues and problems.
3) Expose the trainee to the process of planning, design, implementation and evaluation medical tests.
4) Expose the trainee to acquisition, analysis, reporting and dissemination of data.
5) Offer the trainee opportunity to learn the decision-making process and develop skills in management.
6) Enable the trainee develop co-operative attitudes and team spirit.
7) Expose the trainee to networking process and information sharing.

The organization is expected to give guidance on its goals and mission to the trainee and to give assignment with clear instructions. The trainee should play a complementary role as an extra hand in the organization.

The following may be taken as a guide:

- Situation analysis.
- Planning and design of tests.
- Implementation/ test analysis.
- Evaluation of test data

M. SUPERVISION AND EXAMINATION:

a. Supervision of trainees shall be done by the organization's senior staff who shall be designated as the co- operating officer. He/she shall be responsible for assigning duties to the trainee and also determine the level of performance desired for the task.

b. All assignments should be recorded in the practicum logbook and be countersigned by the co-operating officer. A Monthly summary shall also be given in the log book to cover each Month.
c. Each trainee shall also be visited by the Kenya Medical Laboratory Technicians and Technologist or officer student or officer student Board staff who shall examine the daily assignment entries in the log book and countersign the Monthly summaries.
d. The Kenya Medical Laboratory Technicians and Technologist or officer student or officer student Board staff shall also conduct short interviews with the student and the attachment coordinator officer in order to arrive at a fair assessment of the candidate.
e. The practicum shall be examined through four instruments, which shall form both continuous assessment and terminal examination. Continuous assessment shall be made of:
    I. The daily assignment record (logbook).
    II. The field supervisor's report.
    III. The Kenya Medical Laboratory Technicians and Technologist or officer student or officer student Board supervisor's report.
    IV. Complete written report.

N. PRACTICAL ROTATION COMPLETION REPORT:

The final report is an important document for assessing the trainee. The trainee should therefore take it very seriously. The trainee should ensure the practical rotation completion report is dully filled after the completion of the probation period and ensure it's submitted to Kenya Medical laboratory Technicians and technologist or officer student or officer student Board. The completion report shall be in form of **KMLTTB/IMLS/03A (PRACTICAL ATTACHMENT COMPLETION REPORT)** to cover minimum of sixteen (16) Weeks for Kenya trained students and one year for foreign trained persons.

O. ORACTICUM GUIDELINES.

The guidelines in this context refer mostly to the guidelines touching the conduct of the student trainee. This section therefore deals with the status of the student trainees in the organization, their relationship with the staff members, the field supervisor, the Kenya Medical Laboratory Technicians and Technologist or officer student or officer student Board supervisors and the procedures they are expected to follow.

P. THE RELATIONSHIP OF STUDENTS WITH STAFF

Students are expected to behave and act as actual staff members in the organizations, while on the other hand, they shall be assessed and advised by the their respective approved medical laboratory sciences training instituions,field staff and Kenya Medical Laboratory Technicians and Technologist or officer student or officer student Board supervisors.
The Kenya Medical Laboratory Technicians and Technologist or officer student or officer student Board entrusts the student trainee to the organization and its head, hence they shall be expected to be treated as young staff members in the organization.
The trainees are subject to the rules and guidelines that govern the running of the organization they are attached to.
Student trainees owe due respect to colleagues in the organization; they must co-operate with the members of staff and observe the demands and the routines of the organization.

The student trainees must be in good relationship with their Kenya Medical Laboratory Technicians and Technologist or officer student or officer student Board supervisors and be ready to consult with them.
The student trainees must co-operate with the field/attachment supervisor in the field and ensure that proper record of work is kept.

Q. ROLE OF KENYA MEDICAL LABORATORY TECHNICIANSD AND TECHNOLOGIST OR OFFICER STUDENT OR OFFICER STUDENT BOARD SUPERVISORS

The supervisors are selected from Department of Education and students' practical rotation who are qualified in the trainee's area of specialization.
Supervisors shall be assigned to:

I. Check student's progress in the field and examine their work.
II. Make observation report on the student and bring them back to the Kenya Medical Laboratory Technicians and Technologist or officer student or officer student Board.
III. Guide the students in matters related to their practical work.
IV. Check the logbook, which should contain all the necessary information and sign appropriately.

R. ABSENCE AND LEAVE

When a student trainee wishes to be absent or late in the reporting to work prior arrangement must be made with the field/attachment supervisor. It is a serious breach of professional ethics and requires disciplinary action to be absent from rotation without written permission. Neglect of rotation and absenteeism without prior arrangement leads to automatic disqualification from the practicum/attachment.
In case of absenteeism due to unavoidable situations such as illness or accident, the organization and the Kenya Medical Laboratory Technicians and Technologist or officer student or officer student Board must be informed the soonest possible. Proper documentation of such issues must be kept.

S. PREGNANCY

Student trainees who are pregnant during the practicum must have a medical report from a qualified medical doctor to ascertain the state of their health and ability to cope with the practicum.
Based on the doctor's advice, the student trainee may or may not undertake the practicum.

CONFIDENTIALITY AND TRUST:

Certain matters regarding the organization are confidential e.g. records and certain documents, information, etc.
As a staff member of the organization, student trainee may get access to certain facilities such as computer, books, furniture, lab equipment's, reagents etc. such access is provided on trust, and it is a matter of professional ethics that such services and items are not abused in any way. A breach of such trust during practicum, when reported to the practicum officer shall be treated with the seriousness it deserves.

3.1 DRUG TAKING AND ALCOHOLISM:

Drunkenness and drug taking during the practicum/attachment is not permitted and is a serious offence to be doing hence failure to comply with the guidelines leads to automatic discontinuation from the practicum/attachment.

3. 1. Duty to the global society

Medical laboratory professionals shall:

- Be dedicated to the use of medical laboratory sciences to benefit humanity
- Perform medical laboratory research to improve and develop public health globally
- Be responsible for establishing new standards and develop existing standards for improved medical laboratory practice and patient safety

- Take responsibility and play a leading role towards issues regarding the global and local environment

2. Duty to the client

Medical Laboratory Professionals shall:

- Be responsible for the logical process from the acquisition of the specimen to the production of data and the final report of the test result
- Be accountable for the quality and integrity of medical laboratory services
- Exercise professional judgment, skill and care while meeting international standards
- Maintain strict confidentiality of patient/client information and results of medical laboratory analysis and investigations.
- Safeguard the dignity and privacy of patients/clients
- Implement scientific advances that benefit the patient/client and improve the delivery of results of medical laboratory analysis and investigations.

3. Duty to colleagues, the professionals and other members of the health team. Medical Laboratory Professionals shall:

- Uphold and maintain the dignity and respect of the profession and maintain a reputation of honesty, integrity and reliability
- Continuously improve professional skills and knowledge
- Actively seek to establish cooperative and harmonious working relationships with other health professionals
- Provide expertise and advise, teach and counsel students, colleagues and other health professionals
- Be loyal to the policies, laws and legislations which apply to the workplace, as long as they do not conflict with the professional ethical guidelines

Medical laboratory professionals' oath /solemn promise

I ……As a Medical Laboratory Professional, do hereby pledge to uphold my duty to Patients, the Profession and Society by:

- Placing patients' welfare above my own needs and desires.
- Ensuring that each patient receives care that is safe, effective, efficient, timely, equitable and patient-centered.
- Maintaining dignity and respect for my profession.

- Promoting the advancement of my profession.
- Ensuring collegial relationships within the medical laboratory and with other patient care providers.
- Improving access to Medical laboratory services.
- Promoting equitable distribution of healthcare resources.
- Complying with laws and regulations and protecting patients from persons who may be incompetent and /or illegal practitioners.
- Changing conditions where necessary to advance the best interests of patients

Indexed medical laboratory students issued with an index card/number under the Act and these Guidelines shall adhere to the standards issued by the Board and shall, in particular:-

(a). Be responsible for their individual conduct;

(b) Adhere to the scope of rotation as a student and follow the code of ethics issued by the Board;

(e). be responsible and accountable for continued individual competence;

(f) . be a medical laboratory sciences student within the legal and ethical framework of the medical laboratory science profession;

(g). adhere to globally accepted standards within the medical laboratory science profession;

(h). prioritize patient welfare and care for improved health outcomes;

(i). maintain confidentiality at all times in the course of their rotation;

(j). promote interdisciplinary collaboration with other healthcare students and healthcare professionals;

(k). use medical laboratory reagents and equipment's validated by the Board;

(l). Learn how to prepare reagents for medical laboratory diagnosis and testing using approved methods in accordance with medical laboratory standards and requirements issued by the Board; and

(m). Demonstrate sound professional judgment when handling specimens.

4. An indexed medical laboratory medical laboratory student issued with index card /number under the Act and these Guidelines —

(a) Shall rotate in diagnostic services areas in the community as directed by the healthcare professionals;

(b) Shall rotate where consultant advisory services in all aspects of medical laboratory investigations, including the interpretation and advice on any further appropriate investigations are offered by medical laboratory professionals.

(c) Shall participate as a student to collaborate in systematic education and training members for all members of the medical laboratory staff;

(d) Shall participate and collaborate in the development, study medical laboratory control of new methods, investigations and analysis, whilst adhering to the laid down medical ethics;

(e) Shall participate where provision of advice on approved research projects to be undertaken by healthcare professionals.

(f) Shall participate and undertake medical laboratory sciences operations as may from time to time be specified by the medical laboratory staff.

5. The owner or operator of a health institution shall—

Submit to the Board once in every six months a list of all medical laboratory students

1. in their institutions.

2. Students who are authorized to use their premises.

3. Designate a medical laboratory technologist with a valid practising certificate and practising license to be in charge of medical laboratory sciences students at the health institution.

4. Acquaint themselves fully with the qualifications and professional conduct of all medical students at the health institution.

5. Be responsible for any instance of professional misconduct occurring within the premises about which they know or ought reasonably to have known.

6. Ensure that no medical laboratory technician student in their premises engages in rotations outside the areas of competency for which they have been indexed.

……THE END……