University of Maryland School of Medicine

Department of Medical and Research Technology

Spring 2023 Clinical Rotation Placement Manual

NATIONAL ACCREDITING AGENCY FOR CLINICAL LABORATORY SCIENCES (NAACLS)

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UNIVERSITY OF MARYLAND BALTIMORE
SCHOOL OF MEDICINE

DEPARTMENT OF MEDICAL AND RESEARCH TECHNOLOGY

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UNIVERSITY OF MARYLAND SCHOOL OF MEDICINE
DEPARTMENT OF MEDICAL & RESEARCH TECHNOLOGY

This manual contains the policies and procedures currently in effect for the undergraduate program at the Department of Medical and Research Technology. The Program reserves the right to change, update or modify policies as needed. ALL DMRT students must agree to abide by all policies and procedures established in this document.

PROFESSIONAL POLICIES - University of Maryland Baltimore

The University authorities reserve the right to change the curriculum, in the requirements for advancement and graduation, in fees, and in rules and regulations whenever appropriate.

The provisions of this publication are not to be regarded as an irrevocable contract between the student and the University of Maryland. The University reserves the right to change a provision or requirement at any time within the student's term of residence. The University further reserves the right, at any time, to ask a student to withdraw when it considers such action to be in the best interest of the University.

The University of Maryland, Baltimore, is an equal opportunity institution concerning both education and employment. The University's policies, programs and activities, are in conformance to all federal l and state laws and regulations on nondiscrimination regarding race, color, religion, age, national origin, sex, and disability.

If you require special accommodations to attend or participate in the program or an activity, please provide information about your requirements to the DMRT Program Director at Ldoucette@som.umaryland.edu.

PHILOSOPHY AND GOALS

Mission Statement

To provide a program of instruction at the baccalaureate level which develops competence in ethical, principled laboratory scientists who possess the knowledge as well as the technical, interpersonal and attitudinal skills and attributes which create quality service.

In accordance with the philosophy and purposes of the University of Maryland School of Medicine, the Department of Medical and Research Technology (DMRT) is committed to the following goals:

- to encourage scientific and academic advancement, a commitment to life-long learning, and active participation in professional societies;
- to encourage the practice of moral and ethical values relating to patient care;

- to assist students in developing their level of competency and their analytical decision-making, thus preparing them to make appropriate judgments in their professional life;
- to assist students to develop enhanced skills in critical thinking, problem solving, and skills in oral and written expression;
- to provide the opportunity for student participation in a clinical/research setting designed to offer experiences required of an entry-level Medical Laboratory Scientist;
- to provide and foster student professional development, high standards of achievement, and interactions among other health care practitioners;
- to provide a level of instruction which maintains a progressive and positive educational environment;
- to support a graduate curricula which serves as a natural extension of professional development for those who desire to serve in leadership roles in management, practice, education, and research in the field of clinical laboratory science research.

Clinical Behavioral Norms

As part of our mission to develop laboratory scientists, faculty, staff, and clinical preceptors work collaboratively to cultivate adherence to the DMRT Clinical Behavioral Norms.

Behavioral Norms for MLS Student Clinical Rotation Placement (in person or online)

1. Punctual means:
   - At the **bench** at expected arrival time and ready to work.
   - Return from break/ lunch in the time allotted.

2. Be prepared means:
   - Take responsibility for your learning.
   - Retain the technical knowledge taught in the junior and senior year.
   - Review objectives/class notes prior to rotation.
   - Read the protocols thoroughly and follow them before asking questions.
   - Don't expect to be taught basics that the clinical site assumes you will come to rotation having learned in the didactic courses.

3. Bring a notebook to bench AND take notes!

4. No electronic devices - no cell phone; no texting; no games. Cell phones should be left in your locker at the clinical site and not brought into the laboratory.

5. If you don't know, ask before doing. Questions are always welcome and encouraged.

6. Be responsible for your errors and seek help when needed:
   - Be patient with yourself, it is a learning process.
   - Making mistakes and learning from them are part of the process.
   - Provide and receive respectful feedback

7. Practice integrity and honesty throughout the entire testing process.
   - Follow procedures & protocols exactly.
   - Do not release patient results or use someone else's identification badge for any unauthorized purposes.
   - Do not falsify data or cover up mistakes.

8. Become part of the team, no one is done until everyone is done so:
   - Ask how you can help
   - Use resources wisely
   - Clean up when finished
   - Don't ask if you can leave early
   - Consider rotation time as an interview; a chance to network

9. Be mindful of patient-centered care especially patient confidentiality and safety.
   - Confidentiality goes beyond not talking about patients on elevators or in lunch rooms
   - Follow HIPPA regulations diligently such as not accessing patient results unrelated to the work performed.
   - Do not text details of your day
   - Do not post information on social network sites

10. Adhere to the daily rotation schedule, but be flexible and adaptable with the rotation schedule as well as the work. This includes being willing to help out beyond assigned work.

11. Adhere to the DMRT program's dress code.

12. Maintain enthusiasm for the rotation experience and for the laboratory profession.
   - Seek out opportunities to learn.
   - Join ASCP and ASCLS as a student member.
   - Focus on your current career path (MLS/MT), don't share your "alternatives" (professional school).

13. Be respectful in all communications with patients, laboratory personnel, physicians, staff and other members of the health care team. This includes:
   - Using proper grammar at all times; no jargon
   - Addressing clinical professionals by their proper names such as Dr., Ms. or Mr.
   - Not contacting clinical employees on social network sites (such as Face Book) until after graduation.

14. Document all your work. If your work is not documented (written or electronic), it did not happen.

15. Always remember to thank your clinical preceptors.

BEHAVIORAL OBJECTIVES

One of the goals of clinical rotation placement is to ensure that each student leaves the Department with an understanding of the behavioral standards of the profession and that each student demonstrates a willingness to adhere to these standards. Responsibility for patient care and personal professional behavior will be practiced by all DMRT MLS students. These responsibilities relate to the published mission, goals and core values of the DMRT. Following the completion of the DMRT didactic coursework and clinical rotation placements/externships, the student will demonstrate the ability to:

- prepare for the laboratory experience by reviewing notes, following objectives, and reading supplementary materials;
- present a clean and neat appearance in accordance with the Departmental dress code;
- report to the laboratory promptly and work until excused;
- comply with affiliate policies regarding:

    a. work schedules and proper "in-time" attendance,
    b. sample labeling,
    c. confirmation of patient and sample identity,
    d. patient confidentiality, issues of confidentiality,
    e. appropriate management of discrepancies,
    f. lunch break, eating, etc.,
    g. safety regulations,
    h. quality control protocols, and quality assurance protocols;

- perform procedures within the ethical policy of laboratory practice;
- perform according to his or her own individual strengths and limitations;
- accept constructive criticism in a mature fashion;
- maintain composure, work quality, and friendly relations with others, even under stressful conditions;
- actively participate in performing assigned tasks;
- complete assigned tasks on time, and be willing to adjust personal schedules to accommodate completion of tasks;
- give attention to instruction, listen well, and ask pertinent questions;
- take time to perfect skills, perform them well;
- analyze a procedure before attempting to undertake it; request assistance when necessary;
- state the pathological significance of test results;
- correlate facts, principles, and theories of work procedures in order to identify problems and to evaluate malfunctions;
- organize time, materials, and equipment to perform multiple assays with accuracy;
- identify sources of error and safety precautions;
- operate equipment carefully and skillfully; judiciously utilize reagents and supplies;

- report written results legibly and verbal results accurately and courteously; report results truthfully and objectively, maintaining patient confidentiality;
- volunteer for departmental activities;
- maintain a clean work area, leaving area clean and disinfected at the end of the work day;
- report out when leaving assigned area;
- arrive on time and limit unscheduled absences;
- communicate effectively, professionally and civilly at all times with faculty, staff, students and other health care professionals.

NON-ACADEMIC & TECHNICAL STANDARDS*

Non-Academic & Technical Standards represent the essential requirements of the Department of Medical and Research Technology (DMRT) that each student must master to successfully participate in the program and become employable. Each student must be able to carry out the following in a distraction-filled environment:

1. Identify visually cellular components, microorganisms and their structure using a clinical grade binocular microscope independently.

2. Interpret visually and differentiate colors, shading and intensity on slides, plates, test tubes, printouts, instrument control panels and computer screens.

3. Demonstrate sufficient manual dexterity and fine motor coordination to perform manual manipulation of lab equipment, process specimens, operate, maintain, and calibrate laboratory equipment, and carry out all aspects of laboratory testing procedures accurately and efficiently.

4. Demonstrate sufficient and adequate strength and mobility to perform basic laboratory functions in an established time-frame according to approved policies and procedures. Includes lifting and carrying 30 lbs., and reaching lab benchtops.

5. Demonstrate accurate written, electronic and verbal communication in English to interpret laboratory data, obtain and document relevant information, and comprehend and carryout oral and written instructions and requests.

6. Communicate clearly, accurately, effectively and tactfully when transmitting test results and/or information to diverse colleagues, faculty, classmates, physicians and other health care personnel.

7. Hear sufficiently to answer phones and beepers, recognize alarms, and respond to questions and receive directions. Use assistive devices (e.g., hearing aids, phone receivers, etc.) if needed.

8. Demonstrate professional behaviors including, but not limited to, arriving on-time, teamwork, honesty, accountability and reliability in work, maintaining confidentiality, and adhering to dress code.

NOTE: A distraction-filled environment refers to each student working efficiently and accurately at school and on rotation placement under the following anticipated conditions:

- Fast paced environment
- Noise filled environment
- Strong chemical or biologic odors
- Repetitive motions
- Standing or sitting for long periods of time
- Interruptions to workflow
- Heavy work-load demands
- Variations in temperatures and humidity

Other Fundamental School and/or Employment Expectations

- Working with bio-hazardous material
- Working with blood and biologic specimens
- Organizing work to perform tasks on time
- Complying with background check & immunization policies
- Adhering to all applicable laboratory policies, procedures and safety standards
- Participating in ongoing training, continuing education and competency checks
- Being flexible and adapting to changes in policy, workflow and schedule
- Adhering to the institution's policies that do not allow unauthorized operation of personal electronic devices.
- Working in a customer and patient-oriented service environment
- Maintaining composure and focus even during stressful situations
- Reading and understanding relevant professional and technical publications and documents.
- *** Please Note: It is the student's responsibility to notify the department of any change in status in the above stated abilities.**

POLICIES FOR ROTATION PLACEMENT

CLINICAL ROTATION PLACEMENTS

Each student who meets the academic and professional standards for advancement to clinical rotation placement will be placed at an affiliate site. Every effort is made to assign senior medical laboratory science students and post-baccalaureate students to clinical rotation placement sites according to geographic area, availability, and student interest. However, due to rotation commitments by the affiliates, special arrangements may be required for student placement in clinical affiliate laboratories. The final decision for all rotation placements is made by the program. **Once clinical rotation sites are assigned to the student no changes to the schedule will be made. All students attending clinical rotations must follow the infection control protocol of the affiliate which usually, at minimum, requires wearing a mask at all times except while eating. Due to potential serious COVID-SARS-2 or variant outbreaks, clinical rotations may be canceled by the affiliates and all clinical rotations will then be conducted virtually.**

The Program works closely with the clinical affiliates to assure that all rotation experiences provide comparable entry-level skills and training. A standardized set of Clinical (Behavioral) Objectives and rotation related policies have been developed with input from the clinical affiliates and are distributed annually at the Department of Medical and Research Technology's Clinical Orientation.

BACKGROUND CHECKS

DMRT's academic requirements involve placement at one or more off-campus training sites, such as hospitals and other institutional settings. These off-campus clinical sites routinely require students to undergo and pass a background check, child abuse registry investigation, adult abuse registry investigation and, in some cases, urine drug testing.

More and more hospitals and other clinical training sites are requiring criminal background checks and drug tests to protect the safety of patients and other persons at these facilities, and to ensure the confidentiality of patient information.

Each training site sets its own standards for a background check and/or drug testing and typically conditions placement at the site on passing the check. You may also be asked by the training site to pay the cost of the background check and drug testing. You may have to complete more than one criminal background check and drug test during the course of your rotations, depending on the number of sites at which you are placed and the requirements of each site. Please note that students will be obligated to abide by this policy as well as other policies of the affiliate site.

Students should be aware that results from the criminal background check, urine drug screening, child abuse registry investigation, or adult abuse registry investigation could negatively impact the student's ability to participate in the clinical rotation placement courses. In addition, graduates applying for employment in healthcare are typically required to undergo a criminal

background check and urine drug screening. Each student should use sound judgment and avoid situations which could result in poor decisions. Failure to do so could jeopardize the student's ability to complete the Medical Laboratory Science degree and may impact future employment in healthcare.

If you fail a site's criminal background check or drug test, you may be unable to complete your clinical course requirements. It is important for you to consider this before you enroll. The Department has no obligation to refund your tuition or fees, or to accommodate you in the event that you fail a background check or drug test and, as a result, are unable to complete your clinical course requirements. You should also be aware of the possible consequences under the UMB
campus **Substance Abuse Policy**. Refer to: https://www.umaryland.edu/policies-and-procedures/library/human-resources/policies/vii-110a.php

EVALUATION OF STUDENTS

1. Advancement from the didactic portion of the program to the laboratory portion in the senior year will be based on the student's overall academic record and professional behavior. Progression to clinical rotations is only permitted upon successful performance in both these areas. The Chair reserves the right to deny advancement to clinical rotation placement if any concerns in reference to professional behavior have been raised.

2. Twelve semester hours of Clinical Practice are taken on an **A-D basis** Grades are "Passing with Excellence" (A), "Passing Above Standards" (B), "Passing with Meets Standards" (C), "Below Standards (D), and "Fails to Meet Standards" (F). The minimum pass level for a clinical rotation is "C".

3. The twelve semester hours of Clinical Practice are included in the calculation of the grade point average. Successful completion of each laboratory component is required before graduation.

The laboratory faculty makes a recommendation for the final grade based on written and/or oral examinations, and direct observations as well as the following DMRT evaluations:

a. The Interim Evaluation is to be used by the clinical instructor to monitor the student's progress *during* the rotation. This evaluation is an indication of the student's progress and performance. It should reflect the student's potential to successfully complete the rotation/externship**. It is the student's responsibility to upload the completed Interim Evaluation into the appropriate rotation course**.

NOTE: Any item assigned a rating less than 3 on the student Interim Evaluation, should be communicated by the clinical affiliate to the DMRT faculty liaison or program director by email or phone call for appropriate follow-up.

b. **The Final Evaluation** must include a score on the technical standards, recommendation for a grade, formal evaluation, and documentation of specific observed behaviors with appropriate narrative comments. Successful demonstration of acceptable affective behavior and attendance in accordance with the Department's affective objectives will be required of all students to pass laboratory courses.

It is the responsibility of the student to upload the Clinical Final Evaluation that contains ALL of the necessary signatures and dates into the appropriate clinical course by the post rotation day. These professional evaluation forms become a part of the student's permanent record. The evaluations are confidential and utilized by program officials when prospective employers, graduate schools, professional schools, etc., request recommendations. **Students who fail to upload their signed and dated Clinical Final Evaluation run the risk of failing their clinical rotation and not graduating on time.**

NOTE: Any item assigned a rating less than 3 on the student Final Evaluation, should be communicated by the clinical affiliate to the DMRT faculty liaison or program director by email or phone call for appropriate follow-up.

Copies of both the Interim and Final Evaluation forms may also be accessed on the Clinical Affiliates/Rotations menu, Clinical Rotation Information page on the DMRT web site by going to the following link:
https://www.medschool.umaryland.edu/dmrt/Clinical-Affiliates--Clinical-Rotations/Clinical-Rotation-Information/

Clinical Rotation Placement/Externship for Baccalaureate Students

MEDT 402 Comprehensive Exam and Review

MEDT 402 is taken concurrently with clinical rotations for a letter grade. In addition to obtaining a passing grade for rotation, students must also achieve a **grade of 70**% or higher on the discipline-specific, post-rotation examination in MEDT 402. A score of 70% or higher is required for the Final Comprehensive examination.

Any student earning a score of less than 70% on one post-rotation exam in one discipline area (or less than 70% on the Final Comprehensive exam) will be required to take a second version of the exam within 1 week and achieve a score of 70% or higher. Any student earning a score of less than 70% on a second post-rotation exam in a second discipline area will not be permitted to sit for a re-take. A grade of "D" or "F" will be assigned for MEDT 402 and the student will be required to repeat the course.

Other Rotation Related Evaluations

a. **Pre and Post Rotation Media Lab Exam Grades** are part of the individual clinical course grade. The Pre-Rotation media exam is taken before the rotation begins and the post is taken right after the rotation ends during a review day. These are paper exams and must be taken at DMRT.
b. **The Self Evaluation** enables the students to rate themselves for comparison with the final evaluation filled out by the clinical supervisor. This evaluation may also be used to diagnose student strengths and weaknesses. This form is to be filled out by the student at the department on post rotation day.
c. **The Laboratory Evaluation** allows the student to evaluate his/her laboratory experience. This evaluation, which will be reviewed and evaluated for possible curriculum revision, is given to the discipline representative at post rotation day and reviewed with the clinical faculty in that discipline.

Clinical Rotation Placement: Academic Failure/Removal

Removal from a clinical rotation, based on unethical behavior, unprofessional conduct and/or failure to meet academic or non-academic performance standards, can result in IMMEDIATE SUSPENSION. An Advancement Committee will convene to evaluate the student's case and will forward its recommendation for action to the Department Chair for approval. If warranted, the case will be forwarded to the Judicial Board or the Office of Student Affairs in the Medical School. The decision made by the Dean of the School of Medicine is **FINAL**. The Department of Medical and Research Technology will adhere to this decision.

Academic Failure of a Clinical Rotation/Externship

Failure of a laboratory rotation or externship (grade of "F") may result in academic dismissal.

ATTENDANCE/TARDINESS

Reliable attendance to all aspects of the clinical rotation/externship experience is required. Students are expected to treat attendance at clinical rotation placement as they would employment. Students are required to arrive on time and remain at the rotation site until the completion of the day's assigned duties or as determined by the clinical preceptor.

Absence from clinical rotation is not encouraged and any missed time due to absence, tardiness, or leaving early may have to be made up. Make-up time will be scheduled by the clinical preceptor at a time that does not interfere with the progress of the clinical rotation. The policy for making up missed time will be determined by each clinical site. Please note

that attendance, tardiness and leaving early reflect student professional attributes and are documented on the **Final Evaluation** form for clinical rotation experiences.
In the case of student illness, such as the flu, upper respiratory infection or other illness that could be transmitted to patients, the student is encouraged to remain at home.

Absence, tardiness, or leaving early during clinical rotation placement must be documented by either e-mail or phone call from the student with one communication to the affiliate laboratory preceptor and one to the Program Director. If the clinical preceptor has concerns about UMB student tardiness, absenteeism or leaving early, please contact a DMRT faculty liaison or the Program Director (410-706-7664).

Students are to record on the Attendance Sheets their arrival time, break times and time they leave the rotation on each day of their rotation. The preceptor must sign the form weekly, and the student must upload the attendance sheets weekly in the appropriate clinical course.

Attendance at scheduled DMRT **Rotation Review Sessions is required** for all medical technology students and post-baccalaureate categorical students enrolled in the related rotation experience.

Attendance at **Post Rotation Day is required** for all medical laboratory science students and post-baccalaureate categorical students enrolled in the related rotation experience. Students with unexcused absences on Post Rotation day will NOT be permitted to advance to their next rotation.

STUDENT GRIEVANCE REPORT

Any DMRT student on clinical rotation may formally document a concern or grievance related to the clinical experience. The MT Student Grievance Report Form should be completed and submitted for review to the Program Director. Forms may be obtained from the Office of Student Affairs at DMRT or from the Student Life page of the DMRT web site https://www.medschool.umaryland.edu/dmrt/Academic-Programs--Policies/Student-Grievance--Appeals/.

INCLEMENT WEATHER

Extreme weather conditions or unexpected events may require UMB to delay or cancel classes. In the event of inclement weather, students should periodically check UMB Campus Alerts at www.umaryland.edu/alerts or by calling 410-706-UMAB (8622). Please note that the DMRT will close if the University of Maryland Baltimore campus is closed. **However, DMRT may switch to online labs and/or lecture/or clinical activity due to inclement weather or unexpected events even if UMB is open.** Therefore, students should also check Blackboard for course specific announcements as well as their University of Maryland e-mail.

Sources of information concerning inclement weather announcements include: the Campus Emergency Information Phone number of 410-706-8622, the Campus Alerts web page at http://www.umaryland.edu/alerts, the TV station WBAL-TV, and the radio station WBAL (97.9 FM). Please note that the DMRT will close **ONLY** if the University of Maryland campus is closed. Students should also periodically check Blackboard for course specific announcements as well as their University of Maryland e-mail. How could we alert the students if it is bad weather but UMB does not close?

Students on clinical rotation placement are to check with the MEDT 402 Course Announcements to determine if they are to attend their clinical rotation due to inclement weather and if instruction will be switched to an online format**. If the students are to attend their rotation via the online format, then it is the student's responsibility to contact the department supervisor at the laboratory site that they will not be reporting to rotation. In the case of the campus delaying opening until 10:00 a.m. the student should report to the affiliate site at 10:00 a.m.**

Liberal Leave Due to Inclement Weather

The Liberal Leave policy for UMB in the event of severe inclement weather, or other unusual conditions affecting traffic conditions or the operation of public transit or campus facilities authorizes the President or his designee to declare Liberal Leave to be in effect under which non-essential employees may elect to work or to take accrued annual, holiday, personal, or compensatory leave, or leave without pay.

Students are not covered under the campus Liberal Leave policy and should always check with their school or program, in the event of severe inclement weather or other unusual conditions affecting traffic conditions or campus facilities, regarding class cancelations and/or other academic program requirements such as clinical placement participation.

For DMRT students during Liberal Leave, students on rotation may be switched to the online format. Follow the same procedure as outlined for Inclement Weather. Students are responsible for monitoring University e-mail and Blackboard messages for the decision not to hold classes or proceed with a late start time.

Personal Electronic Device Use on Clinical Rotation Placement/Externship

When on clinical placement, students are required to observe the policies of the affiliate regarding the use of electronic devices. The DMRT does not permit students to use tablets, electronic reading or music devices, earbuds/headphones etc. at any affiliate site and requires students to limit mobile phone use to break and lunch times. Mobile phones will not be used while performing assigned duties at affiliate facilities (includes phone calls, texting, social media).

SERVICE WORK PERFORMED BY STUDENTS

Students on clinical rotation placement are not expected to provide "service work" for the clinical sites during their clinical rotation placements. Students may not be substituted for clinical staff. After demonstrating competency, students may be permitted to perform procedures under qualified supervision; however, it is the responsibility of the supervising employee for final verification of the data and release to the LIS (laboratory information system).

Any service work by students in the clinical setting outside of the academic hours is non-compulsory. If a student chooses to be hired by a clinical site for a job that does not require a certified medical laboratory scientist (MLS), the work hours must be scheduled at a time other than class hours (e.g., evenings or weekends). In such cases, the student is a *bona fide* employee of the site and the work is not considered to satisfy any part of the student's clinical rotation placement.

STUDENT EMPLOYMENT

To support academic success, it is the recommendation of the Department that students not maintain full-time employment and work no more than 16 hours per week. If additional funds are required, financial aid avenues should be pursued. Contact University of Maryland Baltimore Financial Aid at (410) 706-7347 or a DMRT representative for scholarship opportunities.

HIPAA AND RELATED CONFIDENTIALITY ISSUES

Students are required to complete the online HIPAA course offered at UMB. Prior to participating in the clinical practicum rotations, the student is required to sign a form whereby he/she agrees to abide by the rules and regulations of the clinical sites utilized by the program while on their premises during any assigned clinical or research rotations. Clinical sites may require the student to satisfy their specific HIPAA policies.

PERSONAL APPEARANCE AND DECORUM

Since the environment of the Baltimore Campus and the laboratory affiliates of the department is professional rather than typically collegiate; students shall conduct themselves at all times and in all places in a manner which will bring credit to the University, School of Medicine, the Department of Medical and Research Technology and to themselves. Conduct of students in public, particularly within the affiliated hospitals and laboratories, should conform to the highest professional standards.

PROFESSIONALISM AND ACADEMIC INTEGRITY

Students are expected to demonstrate professional conduct in the clinical settings at all times. Such conduct shall include, but is not limited to, academic integrity, honesty and civility as well as honoring patient confidentiality.

DRESS CODE AT LABORATORY AFFILIATES

As professional representatives of the Department and the University of Maryland, students on clinical rotation placement must adhere to the established dress code guidelines for the specific facility. Students will project a professional image. **DMRT must wear their clean DMRT scrubs for all days that they are on clinical rotation.** In addition to observing the guidelines of the practicum site, students must adhere to the following minimum guidelines of the Department of Medical and Research Technology:

- Appearance is to be neat and clean, and demonstrate the use of good body and oral hygiene at all times.
- Socks are required when wearing scrubs to cover legs.
- Cloth, open-toed or perforated shoes (such as crocs) are not permitted in the laboratories. Canvas tennis shoes, flip-flops and slippers are not acceptable. The heel of footwear must be ≤ 2 inches. It is recommended to wear leather shoes.
- Hair must be clean, well-groomed and present a professional image. Hairstyles which extend below the shoulder must be tied back. Non-natural hair color is not permitted.
- Male student's facial hair must be short, neatly trimmed, and maintained.
- Jewelry must be limited; long necklaces, dangling bracelets or earrings extending below the earlobes are not permitted.
- Highly fragranced lotion, perfume, body spray or after-shave should be avoided. Students should be free from offending odors.
- No more than two visible earrings are permitted in each ear. All other piercings (e.g., tongue, nose, eyebrow, lip stud or rings, etc.) must be removed while on clinical rotation/externship or when visiting the Medical Center. Ear gauges are not permitted.
- Tattoos/ body art must be covered (not visible).
- Sunglasses will not be worn inside the school or clinical laboratory.

During clinical rotation placement, students must also adhere to the established dress code guidelines of the specific laboratory. Students should consult with the affiliate institution for site specific information. Instances when a student does not conform to the dress code will result in appropriate disciplinary action, including removal from rotation.

SECURITY AND ORDER

Students are responsible for maintaining security, neatness and order in all areas.

a. Students **must wear their unaltered UMB issued OneCard** (identification badge) at all times and observe all other security regulations
b. Students are responsible for personal property and care of the affiliate institutional property.

LABORATORY PROTOCOLS

The following protocols are to be adhered to by students in the laboratory setting since they comply with the Occupational Safety and Health Administration (OSHA) guidelines that are enforced to ensure the personal safety of students. Violations of these policies will result in immediate disciplinary action. Repeated violations will result in dismissal from the program. Students are responsible for cleaning the laboratory areas, and maintaining proper laboratory safety practices.

- Standard laboratory precautions will be practiced at all times.
- Personal protective equipment (PPE) such as lab coats will be worn in the laboratory at all times. Coats are not to be worn outside the laboratory or laundered by the student.
- Gloves must be worn when handling biological or hazardous materials.
- Splash shields are to be utilized when appropriate.
- Eating, smoking, chewing gum, drinking, and applying cosmetics are prohibited in the laboratory.
- Biological waste and sharps are to be disposed of in appropriate containers.
- Students are not permitted in affiliate laboratories unattended.
- Cell phones, MP3 players, electronic reading devices, etc. are not permitted in the laboratories.

LIABILITY INSURANCE

All students on rotations/externships are required to purchase medical professional liability coverage through the University of Maryland. The coverage is $1,000,000 for each wrong act up to an aggregate of $3,000,000.

MEDICAL TREATMENT FOR DMRT STUDENTS

Cost: All costs for medical treatment or post exposure evaluation and follow-up activities for students are the responsibility of the student. All full time DMRT students are required to have health insurance and the insurance can be billed for all medical services.

ALL STUDENTS ARE TO CONTINUE TO USE THE SAFE REPORTING SYSTEM EVEN WHEN ON THEIR CLINICAL ROTATIONS. STUDENTS ARE NOT TO ATTEND A ROTATION IF THEY HAVE SYMPTOMS OF COVID AND AFTER CONSULTING WITH THE UNIVERSITY OF MARYLAND IMMEDIATE CARE PHYSICIANS.

ALL ACCIDENTS IN THE AFFILIATE LABORATORIES MUST BE DOCUMENTED ACCORDING TO THE AFFILIATE'S INSTITUTIONAL POLICIES AND REPORTED TO THE DMRT PROGRAM DIRECTOR IMMEDIATELY. AN INCIDENT FORM (APPENDIX B AND AVAILABLE ON LINE AT THE STUDENT LIFE PAGE OF THE DEPARTMENT OF MEDICAL AND RESEARCH TECHNOLOGY WEB SITE:

HTTP://MEDSCHOOL.UMARYLAND.EDU/DMRT/DOCS/ACCIDENT_INJURY_FORM.PDF MUST BE FILED IN THE STUDENT'S RECORD WITHIN 24 HOURS AND CAN BE FAXED TO THE PROGRAM DIRECTOR AT 410-706-0073.

POST-EXPOSURE EVALUATION AND FOLLOW-UP FOR STUDENTS

All exposure incidents that occur for students must be reported, investigated, and documented (see Accident & Injury report form in Appendix B).

EXPOSURE AT AFFILIATES OF DMRT

If a DMRT student has an exposure incident at an affiliate laboratory, the student must inform that laboratory's Clinical Liaison or the immediate supervisor to begin the post exposure follow-up procedure. Some affiliate laboratories will perform the testing of both the student and the source individual's blood. However, other affiliates may send the student back to UMB for all testing. It is important that ALL students know the affiliates' policy concerning student exposure to blood borne pathogens PRIOR to an incident occurring**.**

THE DMRT MUST BE NOTIFIED IMMEDIATELY OF ANY INCIDENT/ACCIDENT INCLUDING EXPOSURE TO COVID-SARS-2 VIRUS INVOLVING A STUDENT DURING THEIR LABORATORY PRACTICUM BY CALLING EMAILING LDOUCETTE@SOM.UMARYLAND.EDU. AN INCIDENT FORM (APPENDIX B AND AVAILABLE ON LINE AT THE STUDENT LIFE PAGE OF THE DMRT WEB SITE:
HTTP://MEDSCHOOL.UMARYLAND.EDU/DMRT/DOCS/ACCIDENT_INJURY_FORM.PDF MUST BE FILED IN THE STUDENT'S RECORD WITHIN 24 HOURS AND CAN BE EMAILED TO THE PROGRAM DIRECTOR AT LDOUCETTE@SOM.UMARYLAND.EDU.
Following a report of an exposure incident, the exposed student must receive a confidential medical evaluation and follow-up, including at least the following elements:

1. Documentation of the route of exposure and the circumstances under which the exposure incident occurred.

2. Identification and documentation of the source individual, unless it can be established that identification is not feasible or prohibited by state or local law.

3. The source individual's blood will be tested as soon as feasible after consent is obtained to determine HBV and HIV infection. If consent is not obtained, the person responsible for the Hepatitis B vaccination program will establish that

legally required consent cannot be obtained. When the source individual's consent is not required by law, the source individual's blood, if available, will be tested and the results documented.

4. When the source individual is known to be infected with HBV or HIV, testing for the source individual's HBV or HIV status need not be repeated.

5. Results of the source individual's testing must be made available to the exposed student along with information on applicable laws and regulations concerning disclosure of the identity and infectious status of the source individual.

Collection and testing of blood for HBV and HIV serological status will comply with the following:

- The exposed student's blood will be collected as soon as feasible and tested after consent is obtained.

- The exposed student will be offered the option of having their blood collected for testing of HIV/HBV serological status. The exposed individual **MUST** have a blood test for HIV if the source patient consents for testing.

All DMRT students who experience an exposure incident will be offered post-exposure evaluation and follow-up in accordance with the OSHA standard. The health care professional responsible for the person's Hepatitis B vaccination and post-exposure evaluation will be provided with the following:

- A copy of 29 CFR 1910. 1030. http://www.osha.gov

- A written description of the exposed individual's duties as they relate to the exposure incident.
- Written documentation of the route of exposure and circumstances under which exposure occurred.

- Results of the source individual's blood testing, if available.

- All medical records relevant to the appropriate treatment of the person including vaccination status.

The exposed student will be provided a copy of the evaluating health care professional's written opinion within 15 days of the completion of the evaluation.

The health care professional's written opinion for HBV vaccination must be limited to whether HBV vaccination is indicated and if the student has received such vaccination. It will include a statement that the student has been informed of the results of the evaluation and of any medical conditions resulting from exposure to blood or other potentially infectious materials that require further evaluation or treatment. All other findings or diagnosis must remain confidential and will not be included in the written report.

Student Needle Stick Procedure AND Exposure to COVID-SARS-2 virus

Monday – Friday between the hours of 7:00 a.m. and 5:00 p.m. the following must be done in conjunction with the office of UMB Student Health:

- For all exposures at any time, please call 667-214-1886 to speak with the Provider on call for a Needle stick or other Blood Borne Pathogen Exposure.
- If someone does not answer, please leave a clear message with your name and best contact number to reach you.
- If you have not received a call back in 10 minutes, please retry the call at 667-214-1886.
- If this is during business hours of 7 a.m. – 5 p.m. Monday – Friday and you have not been called back please call 667-214-1899 to contact University Immediate Care and ask to speak with the provider on duty.
- For COVID-SARS-2 exposure, information may be found on the COVID-19 Guide: https://www.umaryland.edu/coronavirus/vaccine/
- Students who may have been exposed, or have tested positive with a home COVID-19 kit MUST complete the form on the COVID-19 Guide. They must also inform their rotation site as to their status and follow their rotation site's guidelines for COVID-19.
- Contact DMRT at 410-706-7664 once you have received a call back from Student Health.

UMB e-mail ACCOUNTS

UMB e-mail accounts are assigned to students at the beginning of the academic school year. Since many DMRT courses are supported by Blackboard, such as the Final Comprehensive Exam, students are required to use their e-mail account provided by UMB. Periodically, throughout the student rotation/externship the Program Director must communicate with students; thus UMB e-mail accounts must remain current and active.

MOBILE PHONES AND ELECTRONIC DEVICES

Students will follow the policy of the clinical affiliate regarding the use of cell phones. DMRT **strongly discourages** the use of cell phones including text messaging during rotation learning activities unless on an official break**. Electronic reading or music devices and electronic games will not** be used at any time during the clinical rotation experience. The use of any and all other electronic devices such as personal lab tops, tablets, mobile phone is also strongly discouraged and may only be used in compliance with clinical affiliate policies.

ACCEPTABLE USE OF COMPUTERS AT UMB AND UMB AFFILIATES

Acceptable use of information technology (IT) resources is used in support of the research, education, service, and administrative activities of UMB or of an Affiliate. Authorized Users should always use IT resources in accordance with UMB, USM, and Affiliate policies, procedures, and guidelines, software licenses, and applicable laws. UMB depends upon a spirit of mutual respect and cooperation to create and maintain an open community of responsible users of UMB IT Resources. Use of UMB IT Resources must be responsible and professional

Authorized Users are responsible for safeguarding their own identification (ID) codes and passwords, and for using them for their intended purposes only. Authorized Users are solely responsible for all transactions made under the authorization of their ID, and for activity involving IT Resources.

Direct and indirect use of UMB IT Resources made available to an Authorized User is a privilege granted by UMB. The privilege is subject to compliance with this policy, other applicable UMB policies, Affiliate policies, and State and federal laws.

A P P E N D I X A

C L I N I C A L O B J E C T I V E S

PROFESSIONAL QUALITIES FOR ALL CLINICAL ROTATIONS

1. Arrive at the laboratory on time and return from lunch/breaks on time.

2. Adhere to the established student uniform policy of the MLS program.

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 including written protocols and procedures and ask pertinent questions.

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 in laboratory protocols and/or results and, take appropriate corrective measures, including seeking help and notifying staff when needed.

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

13. Maintain the confidentiality of all patient information at all times in accordance with HIPPA regulations. This applies to patients or other unauthorized individuals and extends beyond the confines of the clinical setting.

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

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

16. Adhere to standards and regulations regarding proper access and utilization of institutional computers.

17. Adhere to policies of the affiliate regarding the use of ALL electronic devices including, but not limited to, MP3 players and cell phones.

Clinical Performance Objectives in MEDT 453
Clinical Practice in Chemistry
Department of Medical and Research Technology
University of Maryland School of Medicine

Upon completion of the **Clinical Chemistry** rotation the **MLS** student will be able to:

Upon completion of the rotation, the MLS student will be able to:

I. Specimen Handling and Processing

1. Comply with the standard operating procedure (SOP) for specimen handling, distribution, and storage.

2. Implement the standard safety precautions for the clinical laboratory.

3. Check for correct identification/labeling of specimens.

4. Evaluate specimens for appropriate anticoagulant, collection time and site of collection.

5. Identify specimens that may be unsuitable for analysis due to inadequate volume, incorrect anticoagulant used, hemolysis, lipemia, icteric, clot and/ or air bubbles.

6. Explain corrective measures for unacceptable specimens.

7. Prepare a minimum of **20 specimens** for analysis by centrifugation and separation of cells from serum/plasma.

8. Dispose of waste according to laboratory protocol.

II. Quality Assurance, Quality Control and Regulatory issues

1. State the name of the quality control program and control material.

2. Prepare reagents, calibrators and control material within the acceptable QA limits *with 100% accuracy.*

3. Perform calibrations.

4. Perform routine maintenance checks.

5. Evaluate the validity of standardization/calibration of the instrument.

6. Document results of calibration, performance, maintenance checks, malfunctions and corrections *without error*.

7. Identify control results not within the accepted quality control limits *with 100% accuracy.*

8. Discuss appropriate actions for unacceptable control results.

9. Observe corrective documentation for unacceptable control values.

10. State possible sources of error, if results are not within limits (e.g. outside instrument limits).

11. Observe basic LIS computer applications, where relevant.

12. Describe various periodic maintenance procedures for the different instruments and maintenance sheets.

13. Comply with regulatory issues.

III. <u>Performance of Procedures</u>

1. Follow the procedure and safety precautions, *without error*, for analytical instrument and manual testing with respect to:
   a. Specimen preparation
   b. Control selection
   c. Intervals at which standards and controls are to be analyzed
   d. Identification and correct positioning of specimens
   e. Operation of the instrument

2. Pipet reagents and samples accurately.

3. Prepare dilutions with *100% accuracy.*

4. Describe the sample path or flow for one instrument.

5. Complete a minimum of 10 runs/assays *with acceptable results within the laboratory's timeframe specified for stat and/or routine turn around time.*

6. Operate at least one analyzer *with minimal supervision in accordance with laboratory protocol.*

7. Observe the sample path or flow in 2 instruments.

8. Discuss the theoretical principles for each analytical methodology.

9. Demonstrate the ability to organize workflow.

10. Recognize common malfunctions of the instrument.

11. Classify the instruments at the site according to the approach of automation (i.e., discrete and parallel analyzers)

12. Describe/ demonstrate basic trouble-shooting skills for common malfunctions.

IV. Interpretation and Reporting of Results

1. Recognize interfering substances for each procedure performed.

2. Identify patient values that are significantly different than normal (e.g. critical values, analytical errors) and bring these to the attention of the technologist immediately.

3. Determine need for repeat analysis on unacceptable reportable ranges.

4. Determine whether results fit the expected pattern with respect to previously obtained results on the same test or other test results on the same patient.

5. Evaluate a **minimum of 50 patient results** according to laboratory protocol for routine, STAT (including telephone results) and critical value results.

6. Perform and interpret **10 routine calculations** to include dilutions, anion gap, 24 hour urine, creatinine clearance, LDL and thyroid index *with 100% accuracy.*

V. For Immunology

1. State the specimen collection and handling requirements for each immunologic test.

2. Evaluate patient specimens for acceptability, using laboratory policy.

3. If patient specimens are determined to be unacceptable, state the resolution.

4. Prepare controls and reagents results within acceptable QA limits.

5. Using established criteria, determine whether or not available controls and reagents are acceptable for use according to lab protocol.

6. Evaluate quality control data for a **minimum of 3 different immunology assays** performed in the laboratory.

7. Discuss appropriate actions for unacceptable control results.

8. Recognize all critical values obtained during patient testing and report this immediately to the clinical instructor.

9. Demonstrate accurate pipetting technique *to the satisfaction of the clinical instructor.*

10. Perform/ observe the following assay methods:
    a. Immunodiffusion
    b. Direct and Indirect immunofluorescence (e.g. ANAs, FTA-Abs)
    c. EIA (e.g. HIV, Hepatitis, Lyme)

11. Perform/ observe on a minimum of 2 specimens:
    a. Streptozyme assay
    b. Screening or confirmatory testing for Lyme disease

12. Perform a **minimum of 5 screening tests for IM** *with 100% accuracy.*

13. **For RPR and FTA-ABS testing:**
    a. Perform **RPR QC/calibration techniques** (temperature, needle, rotator speed) according to laboratory protocol.
    b. Perform a **minimum of 10 RPR tests** *with 100% accuracy.*
    c. Interpret a **minimum of 10 RPR tests** *with 100% accuracy.*
    d. Perform a **minimum of 2 RPR titers** on previously reactive specimens, *matching the technologist's results within +/–1 dilution.*

Clinical Performance Objectives in MEDT 421
Clinical Practice in Hematology
Department of Medical and Research Technology
University of Maryland School of Medicine

Upon completion of the Hematology Clinical Rotation, the MLS student will be able to:

I. **Specimen Handling and Processing**

1. Comply with the standard operating procedure for specimen handling and distribution.

2. 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 according to safety procedures.

3. Accept only specimens that meet standard laboratory protocol.

4. Describe corrective measures for samples that are lipemic, icteric or contain paraproteins.

5. Describe corrective measures for samples that are rejected due to quantity not sufficient, wrong anticoagulant, cold agglutinin, clotted, hemolyzed, improper patient identification, or improper tube collected.

6. Describe how to handle suboptimal fluid samples.

II. Quality Control, Quality Assurance, Regulatory Issues

1. Evaluate Quality Control results according to criteria established for each test.

2. Describe the various periodic (daily, weekly) maintenance routine for each piece of equipment used during clinical rotations.

3. Observe basic computer applications where relevant.

4. Document instrument maintenance and quality control.

5. Complete all work within established turn around time.

6. Report critical and discrepant results to clinical instructor/supervisor

7. State the confidentiality policy of the facility during testing procedures and reporting according to HIPPA guidelines.

8. Describe the process used to implement a new lot number of control material.

Technical Procedure for Hematology

1. Operate automated hematology instrumentation with minimal supervision and within acceptable ranges.
2. Perform non-automated hematology testing with minimal supervision and within acceptable ranges.
3. Using the automated hematology analyzer, perform a minimum of **40** CBC's and differentials.
4. Recognize abnormal flags on automated instrumentation.
5. Recognize all critical values and/or discrepant results on CBC's and differentials.
6. Report all critical values and/or discrepant results on CBC's and differentials to the clinical instructor.
7. Identify the corrective actions necessary for abnormal automated results.
8. Differentiate between normal and abnormal scattergram (plot) patterns.
9. Identify normal(reference) values for the following routine assays:
    - WBC count RBC indices
    - RBC count platelet count
    - Hemoglobin Sedimentation rate
    - Hematocrit Reticulocyte count
10. Demonstrate proper technique in preparing peripheral smears for microscopic examination to the satisfaction of the clinical instructor.
11. Evaluate a minimum of **20**-**25** peripheral blood smears for acceptable cellular distribution and staining to the satisfaction of the clinical instructor.
12. Perform a minimum of **20**- **25** peripheral smears with a combination of normal and abnormal results with 95% proficiency.
13. Prepare a minimum of **20-25** platelets estimates, agreeing with instruments counts within 20%.
14. Identify abnormal red cell morphologies to include: microcytes, macrocytes, ovalocytes, spherocytes,target cells, sickle cells, schistocytes, burr cells, teardrops, acanthocytes, and rouleaux.
15. Grade abnormal red cell morphologies according to laboratory guidelines.

16. Identify qualitative white cell inclusions to include: toxic granulation, toxic vacuolization, Dohle bodies, and Auer rods.
17. Identify red cell inclusions to include: Howell Jolly bodies, Pappenheimer bodies, basophilic stipling, siderotic granules, and Heinz bodies.
18. Grade hypochromia and polychromasia according to laboratory guidelines.
19. Given a peripheral smear or kodachrome slide, identify the stages of immature white cells.
20. Given a peripheral smear or kodachrome slide, identify the stages of immature red blood cells.
21. Correct the WBC count for nucleated red blood cells according to laboratory guidelines.
22. Given a peripheral smear or kodachrome slide, recognize, but not speciate, malarial forms.
23. Recognize abnormal platelet morphology.
24. Perform **or** discuss reticulocyte counts. If performed, the results should be within 20% of technologist-recorded result.
25. Explain the principle of the ESR and factors which might interfere with accurate results.
26. Perform an ESR with minimum supervision and within QC guidelines.
27. Describe or perform a sickle cell screen (solubility test).
28. Interpret a sickle cell screen according to laboratory guidelines.
29. Associate abnormal hematological results with possible pathology.
30. *If available or applicable*, recognize the normal and abnormal hemoglobin patterns on electrophoresis at pH 8.6 (A, F, S, C, A_2, E, H, Barts, Lepore) on electrophoretic patterns,
31. *If available or applicable*, assist in the proper preparation, staining, and review of bone marrow aspirate.
32. Discuss the use of cytochemistry for classification of acute leukemias.
33. Discuss the use of flow cytometry in the classification of acute leukemias.
34. Compare and contrast the chronic and acute leukemias in terms of onset and major cell type.
35. Discuss the myleoproliferative and myelodysplastic disorders with reference to FAB and WHO classification, and hematologic lab findings.
36. Perform at least two **(5) body fluid manual cell count and differential** according to standard operating procedures.

37. Recognize cells specific to each body fluid type to include:
    - Histiocytes,
    - Mesothelial cells
    - Malignant cells
    - Macrophages with inclusion
    - Crystals
    - Bacteria
    - Yeast

Technical Procedures for Coagulation

1. Discuss the principles of the following procedures and the reagents used
    - PT
    - PTT
    - Thrombin time(*where applicable)*
    - Quantitative fibrinogen
    - D-dimer
    - POC testing(*if available)*

2. Describe or perform:
    - Quantitative fibrinogen
    - Thrombin time
    - D-dimer .
    - Describe the laboratory testing used to monitor anticoagulant therapy.

3. Describe possible pathologic complications of anticoagulant therapy.

4. Describe the intrinsic and extrinsic coagulation pathways.

5. Propose appropriate laboratory test to identify factor deficiencies.

6. Perform minor troubleshooting procedures of available coagulation reagent.

7. Identify common pre-analytic variables that may adversely impact patient results,

   including:

- storage
- type of anticoagulant
- short draw
- clotted sample
- Hematocrit >55
- lipemia
- hemolysis
- *expiration dates on tubes*

9. Describe possible pathologic complications of anticoagulant therapy, including LMWH, heparin, coumadin, and other market available anticoagulants.

10. When given patient history and coagulation test results, correlate thrombotic disorders with available patient history and coagulation test results.

11. In addition to the procedures listed above, discuss the principle, clinical significance, and reagents used for the following coagulation tests:

- Factor assays
- Mixing studies
- Lupus anticoagulant (anticardiolipin assay)
- Factor 5 Leiden
- Protein S
- Protein C (this should be included for MLT also)
- Antithrombin assay
- *Anti Xa assay*

13. Describe possible pathologic complications of anticoagulant therapy.

University of Maryland, Baltimore School of Medicine
Department of Medical and Research Technology
MEDT 421/453 CLINICAL URINALYSIS ROTATION
CLINICAL PERFORMANCE OBJECTIVES
Medical Laboratory Science Students: Note: there are NO pre or during objectives for Urinalysis for you to complete.

Upon completion of the urinalysis rotation 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.

2. Following departmental protocol, demonstrate safe work practices by:

    1. Wearing personal protective equipment (PPE) as required.
    2. Handling and disposing of contaminated materials according to standard precautions.
    3. 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 guidelines from JCAHO.

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.

5. Report or record quality control results according to the standard operating procedures of the laboratory *with 100% accuracy*.

IV. TESTING OF SAMPLE

1. For a minimum of 25 urine specimens *with 95% accuracy*:

- Describe the physical appearance.
- Perform specific gravity analysis using the refractometer and/or dipstick methods.
- Perform chemical analysis of the urine specimens.
- Interpret results obtained from chemical analysis.
- Where applicable, confirm abnormal results with appropriate confirmatory tests for a minimum of **5** different abnormal urine specimens.
- Interpret the confirmatory test results.
- Perform microscopic analysis on urine specimens according to the standard operating procedure of the laboratory.
- Given a specimen or image, 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 *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:

- Cerebrospinal fluid analysis to include cell count, differential, chemistry
- Fecal occult blood
- 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 fluids.

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.

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.

VI. 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
- nitrite
- urobilinogen
- specific gravity

4. Explain the principle and methodology limitations of each test on the multitest 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 limitation s of each of the following confirmatory tests: ictotest sulfosalicylic acid, Clinitest Acetest.

Clinical Performance Objectives in MEDT 472
Clinical Practice in Immunohematology
Department of Medical and Research Technology
University of Maryland School of Medicine

Upon completion of the **Clinical Immunohematology** rotation the **MLS** student will be able to:

I. Specimen Handling and Processing

1. Following departmental protocol and 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 according to safety procedures.

2. Determine the acceptability of a sample for compatibility testing based on sample age, sample appearance and institutional policy.

II. Quality Assurance/Quality Control and Regulatory Issues

1. Perform daily quality control for routine testing according to the operating procedures of the laboratory with 100% accuracy.

2. Recognize discrepant results in routine ABO, Rh and antibody screen testing with 100% accuracy.

3. Report all discrepant results to the clinical instructor.

4. Perform or observe basic laboratory computer applications where relevant.

III. Routine Technical Procedures – ABO/Rh, Ab Screen and DAT

1. Using a "0 to 4+" scale, grade macroscopic agglutination reactions within ± 1 agglutination grade of the instructor.

2. Prepare a 3-5% red cell suspension as needed for tube testing.

3. Label test tubes for routine testing according to laboratory procedure without error.

4. Perform ABO and Rh testing on a **minimum of 25 samples** with 100% accuracy.

5. Interpret the results of ABO and Rh testing without error.

6. Perform weak D testing on designated patient samples when available. (optional)*

7. Perform ABO confirmatory testing on a **minimum of 20 donor segments** with 100% accuracy.
8. Identify mixed field agglutination in 2 samples to the satisfaction of the clinical instructor.
9. Perform antibody screening on a **minimum of 20 samples** to the satisfaction of the clinical instructor.
10. Perform DAT and DAT Battery on a **minimum 2 samples** to the satisfaction of the clinical instructor.

IV. Routine Technical Procedures – Cross-Matching and Transfusion Management

1. Label test tubes for routine compatibility testing according to laboratory protocol without error.
2. Perform the appropriate cross-match procedure, immediate spin (IS) or Full (IAT), on a **minimum of 10 samples** when given the relevant patient information and the policy of the laboratory.
3. Select the most appropriate donor units to crossmatch with a patient when ABO specific red cells are available and when not available.
4. Select the most appropriate donor units when the patient presents with a single alloantibody.
5. Interpret the results of crossmatching with 100% accuracy
6. Distinguish ABO and Rh-related HDN according to clinical and serologic presentation.
7. Perform or discuss the prenatal (mother) and postnatal (mother and newborn) serologic workups for managing cases of HDN.
8. Observe or discuss the procedures for RhIg administration including candidate selection, FMH screening, and dosage determination.
9. Perform or describe a **minimum of 1 transfusion reaction work-up**, according to laboratory protocol.

V. Reference Procedures

1. Perform routine antibody identification panels on a **minimum of 5 samples** according to the acceptable precision of the laboratory.

2. Interpret the results of routine and selected cell panels to determine the specificity of single and multiple antibodies (simple).

1. Perform or discuss the following reference techniques to assist in antibody identification:

   - Selected cell panel
   - Red cell (antigen) phenotyping
   - Enhancement media (PeG & LISS)
   - Acid Elution
   - Saline replacement
   - REST (optional)

V. Donor /Components/Product Disposition

i. Describe, and, if available, perform the processing of a donor to include:
   - Donor history
   - Physical exam
   - Donor acceptability
   - Proper unit collection and handling

2. Discuss or observe the following forms of blood product handling and manipulation:

   - Pooling
   - Aliquoting
   - Washing
   - Irradiating

3. Review the daily inventory and inspection of blood products.

4. Issue or observe the issue (release) of a **minimum of 5 blood products** for administration.

Clinical Performance Objectives in Immunology
Department of Medical and Research Technology
University of Maryland School of Medicine

Upon completion of the **Clinical Immunology** rotation, the MLS student will be able to:

I. SPECIMEN HANDLING AND PROCESSING/LABORATORY SAFETY

1. 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 according to safety procedures.

2. State the specimen collection and handling requirements for each immunologic test.

3. Evaluate patient specimens for acceptability, using laboratory policy.

4. If patient specimens are determined to be unacceptable, state the resolution.

II. QUALITY CONTROL AND QUALITY ASSURANCE

1. Prepare controls and reagents within acceptable QA limits.

2. Using established criteria, determine whether or not available controls and reagents are acceptable for use according to lab protocol.

3. Recognize all critical values obtained during patient testing as abnormal.

4. Report critical values immediately to clinical instructor.

5. State the confidentiality policy of the facility during testing procedure and reporting in accordance with HIPAA guidelines.

6. Observe basic laboratory computer applications where relevant.

7. Review quality control data for a minimum of **three (3)** different immunology assays performed in the laboratory.

8. Evaluate quality control data according to established laboratory guidelines.

9. Discuss appropriate actions for unacceptable control results.

III. **CORE KNOWLEDGE AND SKILLS**

1. Demonstrate pipetting technique in accordance with manufacturers' instructions using all available types of pipettes.

2. Pipette reagents and samples accurately.

3. Calculate all specimen dilution concentrations with 100% accuracy.

4. To the satisfaction of the clinical instructor:

    a. Explain how to correctly calculate both serial and non-serial dilutions.
    b. Explain the concept of lattice theory in antigen/antibody reactions: prozone, equivalence, post zone (and how that might impact patient test results).
    c. Determine corrective action that is needed upon recognizing when prozone has occurred.
    d. Discuss the five classes of human immunoglobulins in terms of physical structure, biological activity and location(s).
    e. Compare and contrast primary and secondary immune responses
    f. Define the functions of the following cell types in regard to their role(s) in the humoral or cellular immune systems: neutrophil, monocyte, macrophage, eosinophil, basophil, B lymphocyte, T_H lymphocyte, T_C lymphocytes and NK cells.
    g. Compare and contrast the terms sensitivity and specificity.

IV. IMMUNOLOGY ASSAY METHODOLOGIES/INSTRUMENTS

1. Discuss the theories/principles of operation of the following assays:

    - Latex agglutination
    - Hemagglutination
    - immunodiffusion
    - Direct immunofluorescence
    - Indirect immunofluorescence
    - ELISA (EIA) sandwich technique
    - Western blot
    - FPIA
    - RIA
    - Flow cytometry

2. Identify the common immunological application of the: fluorometer, chemiluminometer, photometer and fluorescence microscope.

3. Perform if available, the following assays to the satisfaction of the clinical instructor: Latex agglutination, Hemagglutination, EIA.

4. Observe, if available on site, the following assays: Immunodiffusion, Direct and indirect immunofluorescence, FPIA, RIA, Flow cytometry.

V. BACTERIAL SEROLOGY: NON TREPONEMAL (VDRL, RPR) TREPONEMAL (FTA-ABS), STREPTOZYME, LYME DISEASE

1. To the satisfaction of the clinical instructor:

    a. Discuss the theory/principle of each test.
    b. Correlate the disease manifestations with expected test results for each assay.
    c. Explain the significance of reactive, weakly reactive and non-reactive results in the RPR test.
    d. Discuss instances where false positive and false negative RPR and FTA-ABS reactions might be expected to occur.
    e. Perform RPR assay QC/calibration techniques (temperature, needle, rotator) according to lab protocol.
    f. Interpret with 100% accuracy a minimum of **10** RPR screening tests.
    g. Perform a minimum of 2 RPR titers on previously reactive specimens, matching the technologist's results within +/– one dilution factor.
    h. Compare & contrast the RPR and FTA-ABS assays for syphilis in terms of sensitivity, specificity, use in diagnosis, and use in monitoring therapy.
    i. Discuss or perform the Streptozyme assay on a minimum of **2** specimens.
    j. Discuss or perform the screening and/or confirmatory western blot for Lyme Disease on a minimum of two **(2)** specimens.

VI. VIRAL SEROLOGY - HEPATITIS A-C, EBV, HIV, RUBELLA, CMV, HERPES

1. Correlate viral markers with clinical disease for the following: Hepatitis A, B, C; EBV; HIV; Rubella; CMV.

2. List the viral markers used to screen blood donor units.

3. Discuss or perform a hepatitis assay.

4. Explain the theory/principle of screening tests for infectious mononucleosis.

5. Perform a minimum of **five (5)** screening tests for infectious mononucleosis, matching the technologist's results with 100% accuracy.

6. Observe or discuss an HIV antibody screen.

7. Discuss how ELISA and Western blot tests are used to diagnose HIV infection.

8. Discuss the TORCH panel with regard to its use and clinical significance.

VII. AUTOIMMUNITY ASSAYS– ANA, CRP, C3, C4, RF, THYROID ANTIBODIES

1. Observe, perform or discuss the following:

    - ANA assay (both fluorescence and enzyme methods)
    - CRP
    - C3
    - C4
    - RF
    - Thyroid antibodies

2. When given electronic imagess or slides, visually identify the following ANA patterns: homogeneous, peripheral (rim) speckled, nucleolar, and centromere.

3. When given electronic images or slides, correlate the ANA patterns seen with the following disease states: SLE, Sjögrens Syndrome, Mixed Connective Tissue Disease (MCTD), Progressive Systemic Sclerosis (Scleroderma) and CREST Syndrome.

4. If available on site, resolve technical, instrument, and/or physiologic causes of problems or unexpected test results for each assay performed to the satisfaction of the clinical instructor.

Clinical Performance Objectives in MEDT 473
Clinical Practice in Microbiology
Department of Medical and Research Technology
University of Maryland School of Medicine

Upon completion of the **Clinical Microbiology** rotation the **MLS** student will be able to:

I. SPECIMEN HANDLING AND PROCESSING

Follow departmental protocol and 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 according to safety procedures.
d. Properly used biologic safety cabinet when needed.

1. List criteria for evaluating specimens and requisitions for acceptability using laboratory defined criteria.

2. Apply proper specimen handling to microbiological specimens in regard to timeliness, appropriateness of specimen submitted for analysis requested, safety and security of collection system, and completeness of essential patient information, to the satisfaction of the clinical instructor.

3. Document rejected specimens according to laboratory's procedures for specimen rejection.

4. Given any routine specimen for culture:
   a. State the collection system, storage conditions, and acceptable length of storage
   b. Explain the selection and use of appropriate primary culture media for initial plating
   c. State the proper incubation temperature and atmosphere conditions for each medium

5. Given plating instructions and media selection criteria:
   a. Process a minimum of **20** bacterial specimens of different types and prepare smears for Gram stain (if appropriate), to the satisfaction of the clinical instructor.
   b. Demonstrate proper aseptic technique and streaking method, obtaining isolated colonies.

II. QUALITY CONTROL and QUALITY ASSURANCE

1. State the purpose of quality control in the microbiology laboratory.

2. Perform or state the daily or weekly maintenance checks on equipment (i.e. refrigerators, incubators, water baths, instruments) with 100% accuracy.

3. Perform quality control procedures (i.e. stains, media, biochemical tests, antisera, and susceptibility tests) with 100% accuracy.

4. Record all Q C results with 100% accuracy.

5. Report divergent results to instructor and suggest corrective actions

6. Observe basic laboratory computer operations where relevant.

7. State the patient confidentiality policy of the facility during testing procedures and reporting, according to HIPAA guidelines.

III. BACTERIOLOGY

1. Perform Gram stains on a minimum of **15** samples, including both direct smears and cultured colonies, following established laboratory procedures..

2. Evaluate stained smears for stain quality, according to established criteria.

3. Read a minimum of **15** direct Gram stained smears, matching the interpretation of the technologist 80% of the time.
    a. Describe Gram reaction and morphology
    b. Quantitate bacteria and polymorphonuclear cells

4. Demonstrate the ability to select isolated colonies from a culture plate, streak for isolation, and obtain isolated colonies.

5. Correlate Gram stain results with isolates on culture plates to the satisfaction of the clinical instructor.

6. List the criteria for an acceptable sputum specimen.

7. Screen sputum smears for the quality of the specimen to the satisfaction of the clinical instructor.

8. Recognize alpha (α), beta (β) and gamma (γ) hemolysis with 100% accuracy.

9. Distinguish between gram-positive and gram-negative organisms using their Gram stain characteristics and/or their growth on selective media with 100% accuracy.

10. Determine the required biochemical tests for a cost-effective identification of the unknown pathogens.

11. Inoculate all biochemical media and identification systems used in the laboratory, within a reasonable time limit, as determined by the clinical instructor.

12. Determine a positive or negative reaction for each test to include (but not limited to, or exclusive of) the following, matching the technologist's results:

a. Catalase
b. Slide & tube coagulase
c. Novobiocin susceptibility
d. Bile esculin/6.5% NaCl
e. PYR/bacitracin/SXT
f. Spot indole
g. Hippurate hydrolysis/CAMP
h. Optochin/bile solubility
i. Commercial bacterial ID system(s)
j. Haemophilus ID & Neisseria ID systems
k. Oxidase
l. *Streptococci* identification

13. Using the information obtained from Gram stain, isolation on select media, and biochemical testing, demonstrate the ability to utilize flow charts and coded systems to identify the following organisms with a 90% rate of success in identification.

E. coli	*Neisseria gonorrhoeae*
Klebsiella / Enterobacter /Serratia	*N. meningitidis*
Citrobacter spp.	*Moraxella catarrhalis*
Salmonella spp.	*Haemophilus influenzae*
Shigella spp.	*Haemophilus parainfluenzae*
Proteus / Providencia / Morganella	*Campylobacter jejuni*
Staphylococcus aureus	*Clostridium perfringens*
Staphylococcus – coagulase-negative	*Bacteroides fragilis / fragilis* group
Group D *Streptococcus*	*Fusobacterium nucleatum*
Enterococcus faecalis / faecium	*Prevotella spp.*
Viridans streptococci	*Stenotrophomonas maltophilia*
Streptococcus pneumoniae	*Acinetobacter baumanii*
Beta (β) streptococci Gp A /Gp B / others	*Pseudomonas aeruginosa*
Vibrio ssp.	*Listeria monocytogenes*
Yersinia enterocolitica	*Peptostreptococcus/Peptoniphilus*
Abiotrophia spp. (NV *Streptococci*)	*Eikenella/P. multocida*

14. Discuss the isolation and identification of the following organisms:

Mycoplasma/ Ureaplasma
Nocardia asteroides
Aeromonas ssp.
Burkholderia cepacia and other NFB
Pasteurella multocida
Legionella ssp.
Propionibacterium

15. Urine cultures:

a. List common uropathogens.
b. Recognize urethral contaminants vs. potential pathogens.
c. Differentiate between lactose vs. non-lactose-fermenters with 100% accuracy.
d. Quantitate colony counts according to laboratory protocol, matching the instructor's counts.
e. Using laboratory criteria, determine which colony counts/isolates require identification and susceptibility testing, according to the criteria of the laboratory.
f. Perform appropriate identification and susceptibility tests on significant isolates with 90% accuracy.

16. Respiratory cultures:

a. Recognize normal respiratory flora on a minimum of **10** samples to the satisfaction of the clinical instructor.
b. List the primary pathogens detected in throat vs. sputum cultures.
c. Using laboratory criteria, determine which isolates are considered significant for identification and susceptibility tests with 90% accuracy.
d. Rule out group A streptococci in throat cultures with 100% accuracy.
e. Perform or discuss the test procedure for rapid group A streptococcal (GAS) antigen test.

17. Genital cultures (vaginal, cervical, urethral, etc.):

a. Recognize normal vaginal flora, i.e. lactobacilli.
b. Evaluate specimens for the presence of potential pathogens, i.e. *Neisseria gonorrhoeae*, *Gardnerella vaginalis* and group B *Streptococci*.
c. Perform presumptive identification procedures, confirmatory tests and susceptibility tests on suspected pathogens.

18. Stool cultures:

a. List the possible bacterial pathogens for which stool cultures are routinely examined.
b. Describe the appearance of each enteric pathogen on selective/differential media used in the laboratory.
c. Recognize and isolate any suspicious organism to the satisfaction of the clinical instructor.
e. Perform or discuss appropriate identification tests including serological confirmatory tests.
f. State the selective media to isolate the following and describe their appearance on this medium:
   - *E. coli* O:157 H:7
   - *Yersinia enterocolitica*
   - *Campylobacter jejuni*
   - *Salmonella enterica* subsp.
   - *Vibrio* spp.
   - *Aeromonas* spp.
   - *Pleisiomonas* spp.
   - *Shigella* spp
g. State the optimum temperature and atmosphere requirements for *C. jejuni* and *Y. enterocolitica*

19. Blood cultures:

a. Describe the media used for blood cultures and the principle of the blood culture detection system.
b. After performing staining of suspicious or positive cultures, detect the presence/ absence of organisms in the smears with 100% accuracy.
c. Using proper sterile techniques, subculture positive cultures to appropriate media, obtaining isolated colonies.
d. Perform or observe rapid testing methods when indicated.

20. Wound/body fluid cultures:

a. List normal flora and possible pathogens isolated from the site.
b. Perform appropriate identification and susceptibility tests of isolated pathogens with 90% accuracy.
c. Using laboratory criteria, determine which isolates are considered significant for identification and susceptibility tests.

21. Anaerobic cultures:

a. Compare and contrast the Gas Pak™ and anaerobic chamber systems.
b. List the types of clinical specimens that are acceptable/ unacceptable for anaerobic culture.
c. List the media used for primary isolation of anaerobes and the purpose of each.
d. Observe or isolate suspected anaerobic colonies.
e. Perform appropriate identification and susceptibility tests of isolated pathogens using laboratory criteria.

22. Susceptibility testing:

a. Explain the choice of antibiotics in relation to the test organism and clinical source.
b. Perform the Kirby-Bauer disk diffusion procedure according to the procedure manual.
c. Measure zone sizes accurately, within 1-2 mm of technologist's results.
d. Using CLSI chart, interpret and record results without error.
e. Explain potential sources of error in the Kirby-Bauer procedure and appropriate corrective actions.
f. Explain the principles of the MIC microdilution procedure and the E-test.
g. Perform MICs or E-tests to the satisfaction of the clinical instructor.
h. Interpret results of MICs, matching the technologist's results.
i. Perform a test for beta-lactamase with 100% accuracy.
j. Describe the procedures to identify VRE, MRSA, clindamycin-resistant *S. aureus* (D-test), penicillin resistant *S. pneumonia,* ESBL, and CRE.
k. Recognize "typical" susceptibility patterns of commonly isolated organisms.
l. Discuss the significance of susceptibility patterns (results) in VRE, MRSA, VISA, VRSA , ESBL, penicillin-resistant *S. pneumoniae*, and CRE.

IV. MYCOBACTERIOLOGY

1. Describe or demonstrate the safety precautions to be taken when working with mycobacteria.

2. List the specimens most likely to be received for culture of mycobacteria and identify which specimens need digestion/decontamination.

3. List the media that are used in the isolation and cultivation of mycobacteria.

4. Explain why the genus *Mycobacterium* is often referred to as "acid-fast bacilli" (AFB).

5. Observe, perform or discuss the Ziehl-Neelsen, Kinyoun, or fluorochrome acid-fast stain, where applicable.

6. Recognize AFB in clinical or QC stained slides, where applicable.

7. State the criteria and proper report format for numbers of acid-fast bacilli observed in stained smears.

8. Outline the method used to digest, decontaminate, concentrate, and culture specimens for mycobacteriae.

9. Observe the digestion and concentration procedure on culture specimens for mycobacteriae (if performed in lab).

10. State the optimal growth requirements (temperature and atmosphere) for *M. tuberculosis*.

V. PARASITOLOGY

1. State the purpose of each of these techniques used for O&P specimens:
   a. Saline direct smear
   b. Iodine direct smear
   c. Trichrome stain
   d. Concentration (formalin ethyl-acetate)
   e. Cellophane tape prep
   f. Modified acid-fast stain

2. Perform the following techniques to the satisfaction of the clinical instructor (if available):
   a. Trichrome stain
b. Concentration (*e.g.,* formalin ethyl-acetate)

3. Using reference slides, electronic images, CD-ROM or preserved specimens, identify these parasites:
   - *Ascaris lumbricoides*
   - *Strongyloides stercoralis*
   - Hookworm
   - *Enterobius vermicularis*
   - *Hymenolepis nana*
   - *Taenia spp.*
   - *Entamoeba histolytica*
   - *Giardia lamblia*
   - *Entamoeba coli*
   - *Trichuris trichiura*
   - *Plasmodium spp.*, if applicable

4. Identify *Cryptosporidium* on acid-fast smears or DFA.

5. In addition to the parasites listed in objective #3, identify the following parasites, using reference slides and/or preserved specimens (where available):
   - *Dientamoeba fragilis*
   - *Diphyllobothrium latum*
   - *Clonorchis sinensis*
   - *Schistasoma spp.*
   - *Toxoplasma gondii*

VI. MYCOLOGY

1. Describe or demonstrate the safety precautions to be taken when working with fungal isolates.

2. Explain the purpose of each medium used for the isolation of fungi from clinical specimens and the optimum temperature for incubation

3. Recognize yeast vs. filamentous fungi on culture media

4. Identify the presence of *Candida albicans* in a germ tube test (or cornmeal agar or equivalent rapid yeast test) with 100% accuracy.

5. Perform the yeast identification system used in the laboratory with 100% accuracy

6. Describe the preparation **OR** set-up a slide culture for fungal identification

7. Perform latex agglutination test for detection of cryptococcal antigen with 100% accuracy, where applicable.

8. Prepare a LPCB and calcuflor/ KOH preps, to the satisfaction of the clinical instructor.

9. Using prepared slides, colony morphology on fungal media, CD-ROM, and/or electronic images, identify the following molds with 90% accuracy

    - *Rhizopus* spp.
    - *Mucor* spp.
    - *Penicillium* spp.
    - *Aspergillus fumigatus*
    - *Microsporum* spp.
    - *Trichophyton* spp.
    - *Epidermophyton flocossum*
    - *Pneumocystis Jiroveci*

10. Describe the microscopic and macroscopic identifying features of the dimorphic fungi.

VII. VIROLOGY

1. Perform or discuss an RSV antigen detection assay to the satisfaction of the clinical instructor.

2. Perform or discuss at least one additional immunoassay viral detection test to the satisfaction of the clinical instructor.

VIII. MOLECULAR AND RAPID DIAGNOSTICS

1. Discuss the principles and procedures of molecular testing (including GC, *Chlamydia*, *Mycobacterium*)

2. Discuss or perform EIA/molecular methods for *C. difficile* toxin detection.

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

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 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., ictotest, sulfosalicylic acid, clinitest, acetest.

6. Explain the principle and methodology limitations of each of the following confirmatory tests: ictotest, 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 **25** urine specimens with 95% accuracy:

    a. Describe the physical appearance.

    b. Perform specific gravity analysis using the refractometer and/or dipstick methods.

    c. Perform chemical analysis of the urine specimens.

    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.

    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 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 fluids.

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.

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.

Clinical Performance Objectives in Molecular Pathology
Department of Medical and Research Technology
University of Maryland School of Medicine

Upon completion of the Molecular Pathology experience, the MLS student will be able to:

I. SPECIMEN HANDLING AND PROCESSING/LABORATORY SAFETY

a. Specimen Collection
   i. List at least **five (5)** common sources of specimens for evaluation.
   ii. Discuss why samples drawn in heparinized tubes or from heparin-containing lines are generally considered unacceptable for molecular testing.
   iii. List the cap color, anticoagulants, etc. contained in blood draw tubes acceptable for molecular diagnostic testing.
   iv. Describe the processing of a paraffin-embedded tissue sample beginning from Anatomic Pathology to receiving and macro-dissection in Molecular Diagnostics lab.
      1. Describe the difference between a germline (constitutional) vs. a somatic mutation.

b. Specimen Processing
   i. Observe the protocols utilized for specimen processing in the molecular laboratory.
   ii. Evaluate patient specimens for acceptability, using laboratory policy.
   iii. If patient specimens are determined to be unacceptable, state the resolution of the issue.
   iv. Describe the prevention, detection and removal of nucleic acid contamination.
      1. Prevention
         a. Sample Handling
            i. Minimize the number of times a protein-containing tube is opened.
            ii. Change gloves before handling reagents.
            iii. Use dedicated specimen, reagent and PCR product pipets with aerosol-resistant tips.
         b. Reagent Handling
            i. Aliquot master mixes into single run volumes.
            ii. Use pre-packaged single use products when feasible.
            iii. QC each lot of reagents and record lot for traceability.
            iv. Utilize reagents with added UNG (Uracil-N-Glycosylase) to inactive potential contaminating PCR products
            v. Use lowest concentration of + control possible.

c. Preparation of Testing Environment
    i. Utilize UV irradiation before and after every test set up in a hood after first cleaning with bleach, alcohol and water.
    ii. Utilize disposable lab coats, booties, and gloves in the pre-PCR area after walking to the pre-PCR room via a clean room adhesive mat.
    iii. After a potential contamination event, utilize DNA Away, alcohol and/or bleach, RNA Away etc. to eliminate aerosolized contaminants prior to use.
    iv. Clean floors with a dilute bleach solution.

2. Detection

a. Run parallel amplification controls and parallel negative controls.
b. Do routine contamination wipe tests utilizing swabbed samples from workstations, doorknobs, testing equipment computer keyboards.

3. Removal of contaminating nucleic acid

a. Clean testing area and equipment, then replace reagents and all consumables, then take another sample from the patient specimen for repeat testing.

c. Laboratory Safety
    i. Explain how to demonstrate safe work practices, in terms of PPE, handling & disposal of contaminated materials (such as discarded pipet tips), and handling chemicals while performing molecular laboratory protocols.

II. QUALITY CONTROL, QUALITY ASSURANCE, REGULATORY ISSUES

a. Quality Control
    i. Explain the established criteria utilized to determine whether or not available controls and reagents are acceptable for use.
    ii. Observe basic laboratory computer applications where relevant.
    iii. Evaluate quality control data according to established laboratory guidelines.
    iv. Review quality control data for a minimum of **three (3)** different molecular assays performed in the laboratory.
    v. Discuss appropriate actions for unacceptable control results.
    vi. Comply with regulatory issues.
b. Quality Assurance
    i. Discuss the procedure utilized to prepare controls and reagents within acceptable QA limits.
    ii. State the confidentiality policy of the facility during testing procedure and reporting in accordance with HIPAA guidelines.
    iii. Recognize all critical values seen while observing patient testing as abnormal.

III. CORE KNOWLEDGE AND SKILLS

a. Structure, Properties and Stability of Nucleic Acids – see study packet
b. DNA Extraction Methods
   i. Compare and contrast **three** manual methods for extraction of DNA.
   ii. Describe an automated method utilized for extraction of DNA.
c. RNA Extraction Methods – see study packet
d. Quantification of Nucleic Acids
   i. Compare and contrast the use of the following procedures in quantification of DNA: spectrophotometry, microvolume (Nanodrop) and fluorometry (Qubit).
   ii. Calculate the concentration of DNA given appropriate data.
   iii. Calculate the purity of DNA by use of the OD_{260}/OD_{280} ratio.
   iv. Interpret the OD_{260}/OD_{280} ratio result with appropriate conclusions.
e. Proficiency Testing
   i. Observe the review of a proficiency testing sample result from the CAP service.

IV. PERFORMANCE OF PROCEDURES

a. Analytical Principles
   i. Discuss the theories/analytical principles of operation of the following methods:
      1. DNA Extraction, quantified by Nanodrop
      2. BK Polyoma Virus Quantitative RT-PCR
      3. STR (short tandem repeat) Assay
      4. Melt Curve Analysis
b. Maintenance
   i. List the steps performed in Thermocycler Monthly Maintenance.
   ii. Observe the weekly maintenance procedure for the 3130 Genetic Analyzer.
   iii. Describe the most important steps contained in the above procedure, to include why each is necessary.
c. Reagent Preparation
   i. Observe the preparation of the PCR Mastermix reagent for RT-PCR.
   ii. Discuss the preparation of the 5% sensitivity control (according to standard operating procedure), to include the calculation needed to make the correct concentration for testing.
d. Sample Testing
   i. Observe the Qiagen EZ-1 Biorobot DNA extraction procedure.
   ii. Observe the quantitation of DNA via Nanodrop.
   iii. Observe PCR set up and loading procedure for the Real Time PCR BK Polyoma Virus assay.
   iv. Observe PCR set up and loading procedure for the STR assay.
   v. Explain how the BK and STR assays differ in performance of the assay.
   vi. Compare and contrast the difference between manually running a gel and the automated capillary electrophoresis assay for STR.

e. Interpretation of Results
   i. Observe the RT-PCR interpretation demonstrated by the performing technologist.
   ii. Given a printout of a different RT-PCR test result, correctly interpret what is shown to the satisfaction of the clinical instructor.
   iii. Observe the interpretation of a melt curve analysis.
   iv. Given the result of a melt curve, interpret the result to the satisfaction of the clinical instructor.

A P P E N D I X B

S U P P L E M E N T A L F O R M S

University of Maryland, Baltimore School of Medicine
Department of Medical and Research Technology
Medical Laboratory Science Program
Student Mid-Term/ Clinical Contact Report

Student's Name _____ Evaluation Date _____

Affiliate Name _____ Laboratory Area _____

Circle Rotation 1 2 3 4 Number of late occurrence_____

Please evaluate each student, by circling either Yes/No. Use the descriptors provided for reference.

Interest: (Yes No)
Student is prepared, a self-starter, and actively participates in duties

Responsibility: (Yes No)
Student complies with institutional policies, adheres to safety standards and seeks help when appropriate.

Professional Behavior: (Yes No)
Student maintains HIPPA policies, promotes a working atmosphere with other professionals, adheres to scheduling protocols

Knowledge: (Yes No)
Student demonstrates understanding of basic theoretical concepts

Technique: (Yes No)
Student performs tasks at the expected level of a student at this point of the rotation

Rationale must be given for any "No" Responses:

_____

_____

_____

Comments:

_____

_____

Evaluator _____ Date _____

Student _____ Date _____

UNIVERSITY of MARYLAND
SCHOOL OF MEDICINE

DEPARTMENT OF MEDICAL & RESEARCH TECHNOLOGY
UNIVERSITY OF MARYLAND SCHOOL OF MEDICINE

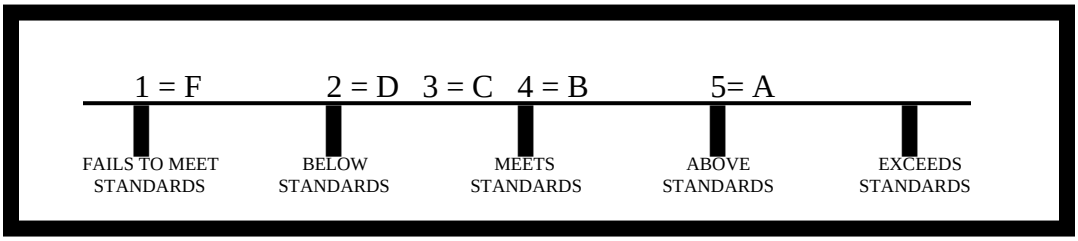
FINAL CLINICAL EVALUATION

Student: _____ Evaluation Date: _____

Rotation Number: _____ Affiliate: _____

Discipline: _____

The primary objective of this assessment is to ensure that each student enters the clinical laboratory science profession with an understanding of its behavioral and skill standards by demonstrating a willingness to adhere to those standards. Circle the number, which corresponds to the student's performance in each category using the following rating scale as a guide.



1. ***Fails to Meet Standards –*** Performance is below entry-level expectations. Student does not meet minimum standards. Performance is unacceptable.

2. ***Below Standards –*** Performance is marginally below entry-level expectations. Student needs to improve to meet minimum standards.

3. ***Meets Standards –*** Meets entry-level expectations and minimum standards.

4. ***Above Standards –*** Consistently meets entry-level expectations and minimum standards. Excels in certain areas. Student has demonstrated a high level of initiative and independent functioning.

5. ***Exceeds Standards –*** Clearly outstanding. Consistently exceeds entry-level expectations and minimum standards. Student has demonstrated a high level of initiative and independent functioning.

STANDARDS OF CLINICAL PRACTICE Please circle the number that matches the student's knowledge or technique.

1 =F, 2 = D, 3 = C, 4 = B, 5 = A.

- **KNOWLEDGE**

❖ Demonstrates understanding of basic theoretical concepts.

1 2 3 4 5

❖ Demonstrates knowledge of general quality assurance principles and practices.

1 2 3 4 5

❖ Correlates pathological significance of test results with laboratory data.

1 2 3 4 5

❖ Recognizes patient abnormal results and takes appropriate action.

1 2 3 4 5

❖ Identifies problems, errors, or malfunctions appropriately at an entry level.

1 2 3 4 5

- **TECHNIQUE**

❖ Applies theoretical principles to current tasks.

1 2 3 4 5

❖ Completes assigned tasks within an acceptable time frame.

1 2 3 4 5

❖ Accomplishes tasks with minimal supervision.

1 2 3 4 5

❖ Reports accurately and efficiently.

1 2 3 4 5

❖ Demonstrates appropriate entry-level troubleshooting skills.

1 2 3 4 5

OVERALL SUMMARY OF STANDARDS OF CLINICAL PRACTICE

Please rank student's overall performance:

1 – FAILS TO MEET STANDARDS
<60%

2 – BELOW STANDARDS
60 – 69.4%

3 – MEETS STANDARDS
69.5 – 79.4%

4 – ABOVE STANDARDS
79.5 – 89.4%

5 – EXCEEDS STANDARDS
89.5 – 100%

FINAL EVALUATION: PROFESSIONAL QUALITIES EVALUATION

SKILLS	Satisfactory (5 pts)	Needs Improvement (4 pts)	Unsatisfactory** (1 pt)	Average of CIs
1. Punctuality	▪ Only late 1x ▪ Does not abuse breaks	▪ Occasionally late **or** ▪ Occasionally abuses breaks	▪ Frequently late **and** ▪ Takes too long on breaks	
2. Initiative	▪ Prepared, ready to work ▪ Reads procedures thoroughly ▪ Self-starter, requires minimal help	▪ Usually prepared ▪ Reads procedures thoroughly, **but** ▪ Requires some help getting started	▪ Not well prepared ▪ Procedures not read beforehand or not read thoroughly ▪ Constantly needs help getting started	
3. Willingness to Learn	▪ Uses downtime constructively ▪ Asks insightful questions; participates in discussions	▪ Sometimes uses downtime constructively ▪ Asks few questions or unnecessary questions	▪ Does nothing constructive in downtime ▪ Assimilates information passively, indifferently	
4. Follows Instructions	▪ Follows directions / instructions without coaching	▪ Often follows directions / instructions without additional coaching	▪ Has difficulty following directions / instructions, even with coaching.	
5. Organization Skills	▪ Organizes work in a logical sequence ▪ Produces required quantity of work with accuracy & within assigned time frame	▪ Usually organizes work in a logical sequence ▪ Usually produces required quantity of work with accuracy & within assigned time frame	▪ Consistently requires help with organization ▪ Can NOT complete required quantity of work with accuracy & within assigned time frame	
6.Professional Judgment	▪ Independently carries out responsibilities ▪ Recognizes own limitations ▪ Seeks help when needed	▪ Checks routinely before proceeding ▪ Usually recognizes own limitations; ▪ Usually seeks help when needed	▪ Does not recognize own limitations, even after instructor points it out; ▪ Proceeds on own without checking with clinical instructor; ▪ Refuses to seek help	
7. Accountability	▪ Usually recognizes mistakes **and** ▪ Takes corrective action when necessary	▪ Sometimes recognizes mistakes **and** ▪ Takes corrective action when necessary	▪ Never recognizes mistakes ▪ Corrective action initiated by instructor	
8. Adaptability	▪ Functions well in stressful/ unexpected situations; rarely gets flustered. ▪ Flexible to change in student's schedule.	▪ Able to function adequately in unexpected/ stressful situations; occasionally gets flustered. ▪ Somewhat flexible to change in schedule.	▪ Cannot function in unexpected/ stressful situations; gets extremely flustered ▪ Inflexible to change in student's schedule	
9. Attitude	▪ Willingly performs assigned tasks ▪ **Seeks input on his/her performance** ▪ Responds readily to constructive criticism ▪ Respects others' professional roles ▪ Professional in all communication	▪ Willingly performs assigned tasks ▪ Responds to constructive criticism with some resistance ▪ Usually respects others' professional roles ▪ Usually professional in most communication	▪ Willfully insubordinate **OR** ▪ Unresponsive or hostile towards criticism **OR** ▪ Unprofessional or abusive to others	
10. Adherence to Policies	**(5 pts) Does:** ▪ Maintain patient and institutional confidentiality ▪ Comply with safety policy and practices ▪ Adhere to department policies for use of computers, electronic devices ▪ Follow the dress code	**(0 pts) Does NOT**: ▪ Maintain patient and institutional confidentiality ▪ Comply with safety policy and practices ▪ Adhere to department policies for use of computers, electronic devices ▪ Follow the dress code	X	
			Total Points in Ave. column x 100 / 50	**%**

Overall Student Grade for Rotation

Please write the numerical grade that the student has earned during this rotation. This includes the practicum score and the technical score.

Student's Rotation Numerical Grade for the **Practicum Exam:** _____ x 0.10 = ____ **(1)**

Student's Rotation Numerical Grade for the **Technical Skills**: _____ x 0.55 = ____ **(2)**

Student's Rotation Numerical Grade for the
Professional Qualities Evaluation: _____ x 0.10 = ____ **(3)**

TOTAL _____ **highest score 75%**

NOTE: Practicum, technical skills and professional qualities evaluations equals up to 75% of rotation grade remaining 25% is calculated from media labs and student objectives.

Clinical Staff Signature: _____Date: _____

The evaluation should be given to the student on the last day of the clinical rotation.

Student: Review this evaluation and **CHECK ONE** of the statements below.

_____ I have read this evaluation and have no comments.
_____ I have read this evaluation and my comments are on the reverse side of the page.

Student signature: _____ **Date:** _____

Final Evaluation by University of Maryland, Baltimore School of Medicine, Department of Medical and Research Technology's Medical Laboratory Science Program:

_____Passing

_____Failing

Days Absent:_____Days Tardy:_____Days Made Up:_____

_____ _____
Program Director Date

PRECEPTOR COMMENTS:

I recommend that the student receive a final evaluation of:

____ Passing with Excellence

____ Passing

____ Failing

Days Absent _____ Days Tardy _____ Days Left Early _____ Time Made-up ____

Evaluated by: _____ _____ _____
Affiliate Signature Title Date

_____ _____ _____
Affiliate Signature Title Date

- I have reviewed this evaluation and agree with its content:

  _____ _____
  Student Signature Date

- Student has returned affiliate's badge (if applicable) ☐ Yes ☐ No ☐ NA

  _____ _____ _____
  Affiliate Signature Title Date

STUDENT COMMENTS:

Final Evaluation By DMRT:

___ Passing with Excellence >89.5%

___ Passing > or = to 69.5-89.4%

___ Failing < or = to 69.4%

_____ _____

Program Director Date

Department of Medical & Research Technology
University of Maryland School of Medicine

STUDENT SELF EVALUATION

Self-evaluation is a process that contributes to effective learning experiences. The systematic use of a self-evaluation should yield objective information and form the basis of positive future activities. Your participation and constructive use of this evaluation is greatly appreciated.

Date:_____

Section I

A. Student Name: _____

B. Rotation Number (circle one): I II III IV Summer I Summer II

C. Name of Affiliate: _____

D. Discipline (check one): ☐Chemistry ☐Hematology ☐Microbiology
☐Blood Bank ☐Immunology/serology

Section II
Directions: Briefly answer the following questions.

1. Did your academic training adequately prepare you for this rotation? If not, what specific improvements could be made?

2. Did you read and follow the course objectives as you progressed through this rotation? Did the objectives enhance the learning process? Were they reasonable and attainable?

3. Did you demonstrate active participation in performing assigned tasks? Please provide an example.

4. How did you prepare for daily activities and assignments at the clinical affiliate?

Section II - continued

5. How much time did you spend supplementing your practical experiences gained in the laboratory rotation with review of theory presented during your didactic training?

6. In which of the following areas(s) do you believe you improved the most while in the rotation?

____ technical dexterity	____ new or alternative techniques	____ speed
____ confidence	____ interpersonal skills	____ other (specify)

7. Did you take initiative in asking questions, requesting assistance or clarification when necessary? If not, why not?

8. Describe your general response to feedback from clinical faculty.

9. Do you believe this rotation prepared you adequately for future employment in the clinical laboratory science profession? If not, why not?

10. What can you do to improve future experiences in the clinical laboratory?

11. What person at this clinical site impacted your rotation experience the most?

DEPARTMENT OF MEDICAL AND RESEARCH TECHNOLOGY
UNIVERSITY OF MARYLAND SCHOOL OF MEDICINE
CLINICAL COURSE EVALUATION

Evaluation is a continuous process that underlies all successful and effective teaching and learning experiences. The systematic use of planned evaluation procedures yields objective information and the more accurately we judge, the more effective we will be in directing learning. The information provided by this evaluation will be used to make decisions regarding program improvement and curriculum modification. Your participation and constructive use of this evaluation is greatly appreciated.

SECTION I

A. Student Name: _____ Date: _____

B. Rotation Number (circle one) I II III IV Summer I Summer II

C. Name of Affiliate: _____

D. Discipline (check one)

Chemistry Hematology Blood Bank Microbiology

SECTION II

Directions: Please check the appropriate response to the following questions pertaining to your clinical experience.

1. Did you receive an orientation at your clinical affiliate use?
☐ Yes☐No

2. DMRT clinical objectives were distributed to you and the affiliate.
Were the objectives:
   a. Clearly stated? ☐Yes ☐No
   b. Helpful? ☐Yes ☐No
   c. Realistic? ☐Yes ☐No
   d. Utilized? ☐Yes ☐No

3. Were you given a separate learning checklist by the affiliate?
☐Yes ☐No

4. Were you notified of the evaluation procedures in advance?
☐Yes ☐No

5. Was your daily schedule organized and task assignments clearly specified?
☐Yes ☐No

6. Were laboratory procedure manuals available for you at the bench?
☐Yes ☐No

7. In your opinion, were your experiences:
   a. Adequate in number and variety ☐Yes ☐No
   b. Well-organized ☐Yes ☐No
   c. Adequately supervised ☐Yes ☐No

8. In general, did the teaching technologist(s):
   a. Show genuine interest in your education ☐Yes ☐No
   b. Incorporate theoretical information with practical training ☐Yes ☐No
   c. Encourage active participation in workstation activities ☐Yes ☐No
   d. Clearly explain expectations for daily work ☐Yes ☐No
   e. Suggest complementary and/or reference readings reviews
   ☐Yes ☐No

9. In general, did the laboratory personnel promote an environment that was:
   a. Conducive to learning ☐Yes ☐No
   b. Open to questions ☐Yes ☐No

   Did this experience effectively transfer your learning at DMRT to clinical practice?
   ☐Yes ☐No

SECTION III

Directions: Briefly answer the following questions:

11. Were there any specific rotation areas that needed more time?

12. Were there any specific rotation areas that needed less time?

13. If there was an opening, would you seek employment with this clinical affiliate institution? In which laboratory? _____ ☐Yes ☐No ☐Unsure

14. What positive factors in this facility make it desirable for training Medical Laboratory Scientists (MLS)?

15. Can you name someone at this facility who impacted your experience in a positive way?

Additional Comments:

A P P E N D I X C

F A C U L T Y C O N T A C T L I S T

List of DMRT Faculty Liaisons

MLS GRIEVANCE FORM

&

ACCIDENT & INJURY REPORT

Department of Medical and Research Technology

Faculty Contact List - Spring 2023 Clinical Rotations

Faculty Contact	Faculty Contact Information	Affiliate
Lorraine Doucette	**410-706-7664 or 1829** **410-979-1976 (cell)** **Ldoucette@som.umaryland.edu**	• **Luminis Health Anne Arundel Medical Center** • **Holy Cross Hospital** • **The Johns Hopkins Hospital (JHH)** • **The National Institutes of Health – Hematology/Blood Bank** • **University of Maryland Medical Center (UMMC) – Chemistry**
Dr. Leo Kenefic	**410-706-2626** **lkenefic@som.umaryland.edu**	• **Johns Hopkins Bayview Medical Center** • **Mercy Medical Center - Microbiology** • **University of Maryland Medical Center (UMMC) – Microbiology**
Dr. Lilia Mijares	**410-706-3771** **lmijares@som.umaryland.edu**	• **The Johns Hopkins Hospital (JHH) – Microbiology** • **The National Institutes of Health (NIH) – Microbiology**
Eileen Patton	**410-706-3772** **epatton@som.umaryland.edu**	• **Frederick Health Hospital** • **MedStar Georgetown University Hospital** • **Mercy Medical Center – Blood Bank/Hematology**
Dr. Ivana Vucenik	**410-706-1832** **410-746-5680 (cell)** **ivucenik@som.umaryland.edu**	• **University of Maryland Medical Center (UMMC) – Hematology**

DEPARTMENT OF MEDICAL AND RESEARCH TECHNOLOGY
MLS STUDENT GRIEVANCE REPORT FOR CLINICAL ROTATIONS

CLINICAL AFFILIATE: _____
ROTATION: _____
DISCIPLINE AREA: _____
FACULTY LIAISON: _____
DATE: _____

Describe the issue or concern related to your clinical rotation experience. You may attach typed comments to this form.

STUDENT REPORT:

_____
_____
_____
_____
_____
_____

_____ _____
STUDENT NAME (please print) **DATE**

_____
Student Signature

REVIEWED BY: _____ _____
PROGRAM DIRECTOR **DATE**

ACTION PLAN:_____
_____
_____
(Attach additional information as needed)

Department of Medical and Research Technology
University of Maryland, School of Medicine

Accident/Injury/COVID SARS2 Exposure/Illness Report Form JT-1

Name of Individual:
Date of Incident or Exposure/Illness:
Name of person first contacted about the incident (*Instructor*)
Description of Injury/exposure/illness:
How did the incident occur? (*describe fully*)
Name of object or item involved if an accident:
Was safety equipment provided (*circle*) YES NO
Was safety equipment in use at the time of injury? YES NO
Was accident caused by injured's failure to use or observe safety regulations? YES NO
Was the injury treated at the scene or by a doctor at a treatment facility?
If treated at the scene of the accident, describe treatment:
Did the injured/exposed/ill student return to school or work, if so, time and date:
Follow up:
Signature of person filing report:
Date of report: