

**THOMAS JEFFERSON UNIVERSITY
JEFFERSON COLLEGE OF HEALTH PROFESSIONS
DEPARTMENT OF BIOSCIENCE TECHNOLOGIES**

Medical Technologist/Clinical Laboratory Sciences



**Clinical Practicum Handbook
2008**

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**THOMAS JEFFERSON UNIVERSITY
COLLEGE OF HEALTH PROFESSIONS
DEPARTMENT OF BIOSCIENCE TECHNOLOGIES
PROGRAM IN MEDICAL TECHNOLOGY**

INTRODUCTION

Clinical education is an integral part of the Program in Clinical Laboratory Science and is designed to provide students with an opportunity of integrate and apply previously acquired knowledge and technical skills in an actual clinical setting. Under the guidance of experienced medical technologists and other qualified laboratory personnel and health professionals, students learn more about diagnostic test procedures, quality control methods and programs, and instrumentation in the clinical laboratory. They also gain an understanding of the roles and functions of the medical technologist and other health care professionals

Clinical education practica is an applied learning experience during which the student should:

1. practice skills learned in student laboratories
2. practice skills in problem-solving
3. perform quality control procedures
4. learn to adapt easily to new procedures
5. operate and maintain various instruments used in routine clinical testing
6. understand the responsibilities, roles, and functions of the medical technologist
7. develop organizing ability
8. report accurate and precise results
9. relate test results to patient conditions

Clinical practica courses are conducted in the affiliated laboratories of the program, where students learn by participation in the workload of a supervising technologist. Emphasis in each course is on the following: (1) organization of work, (2) use of automated instrumentation, (3) the relation of laboratory results to patient diagnosis, and (4) the establishment and use of programs for quality control and preventive maintenance of laboratory instruments. Matriculation in these courses is permitted only after successful completion of the related medical technology course specified in each listing.

COURSE NUMBERS AND TITLES:

UNDERGRADUATE:

MT 412	Clinical Practicum I	- 4 credits
MT 422	Clinical Practicum II	- 4 credits
MT 442	Clinical Practicum III	- 4 credits
MT 454	Clinical Practicum IV	- 4 credits

GRADUATE:

LS 812	Clinical Practicum I	-2 credits
LS 813	Clinical Practicum II	- 2 credits
LS 814	Clinical Practicum III	- 2 credits
LS 815	Clinical Practicum IV	- 2 credits

These practica encompass the clinical areas of Hematology/Coagulation, Urinalysis, Clinical Chemistry, Microbiology, Clinical Immunology, and Immunohematology

PROGRAM FACULTY:

Janet Devine, EdD, MT(ASCP)

Program Director

tel: (215) 503-8187

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email: janet.devine@jefferson.edu

Program Contact Number ~ call (215) 503-7844 to report lateness, sick time, or emergencies

CLINICAL AFFILIATE SITES and CLINICAL INSTRUCTORS:

1. Thomas Jefferson University Hospital – Philadelphia, PA
 - Microbiology James Bondi, supervisor 215-955-8744
Denise Ward, education coordinator -1679
 - Chemistry Peggy Rapa 215-955-8837
 - Transfusion Services Donna Goldner 215-955-1134
 - Immunology Dr. Laura Mc Closkey 215-955-1414
 - Histocompatibility Debra La Cava 215-955-2251
 - Flow Cytometry Linda Blumstein 215-955-1287
 - Special Coagulation lab Gene Pullen/ Megan Hevelow -8459
 - Phlebotomy Caroline Lamina
2. Lankenau Hospital, Main Line Clinical Laboratories – Wynnewood, PA
 - Education Coordinator Marlo Dilks 610-645-2623
 - Microbiology Dr. Olarae Giger 610-645-3514
 - Chemistry

- | | |
|----------------------|-------------------------|
| Hematology | Laura O'Shea |
| Immunology | Anne Marie Brewer |
| Transfusion Medicine | Liz Klinger |
| Bryn Mawr Hospital | Glenn Bull 610-526-3545 |
3. University of Pennsylvania Hospital – Philadelphia, PA
Education Coordinator Gerald Macchione
 4. Einstein Medical Center – Philadelphia, PA
Laboratory Administrator Ann O'Connell 215-456-6104
 5. Frankford Hospital- Torresdale – Philadelphia, PA
Assistant Laboratory Manager/
Education coordinator Mary Ellen Thorpe 215-612-4040
 6. Veterans' Administration Medical Center – Philadelphia, PA
Chief Technologist Joy Porter 215-823-4414
 7. Kennedy Health System- Cherry Hill, NJ
Laboratory Manager Zoe Rodriguez 856-488-6562
 8. Our Lady of Lourdes Medical Center-Camden, NJ
Laboratory Director Ahmed Salahuddin 856-757-3562
Laboratory Administrator Terry Graner 856-757-3561
 9. Temple University Hospital – Philadelphia, PA
Laboratory Administrator Robert Murphy 215-707-3238
Blood Bank supervisor Linda McWilliams 215-707-2051

PHILOSOPHY:

The science of medical technology is a laboratory-based system whereby the physiological processes of the body are recognized, measured and monitored. The medical technology curriculum applies the basic precepts of biochemistry and physics to clinical methodology and theory. The education of medical technologists seeks to develop mastery of techniques as well as understanding of the relationship of results to normal and abnormal physiological processes within the body.

The graduate technologist should understand the necessity of considering the patient's welfare a part of each test that he performs. He should be committed to accuracy and reliability in his work. He should understand the importance of personal and professional ethics when dealing with patients and should treat any results or information received with utmost confidentiality.

Through sound training and supervision, a medical technologist should develop a wholesome respect for his profession and what he contributes to health care delivery. He should also have an understanding of, and respect for, the roles of other health professionals. Such interdisciplinary cooperation will enhance the treatment of the "whole" patient and improve the continuity of care.

The goal of educating health professionals is to improve the quality of patient care. The goal of educating medical technologists in particular is to produce a qualified practitioner to aid in the diagnosis and prevention, as well as to monitor the treatment, of disease. Through his commitment to the improvement of the quality of life, the medical technologist should recognize the necessity of broadening and updating his knowledge and skills. He should continually seek new and better methods of turning out more reliable and definitive results in the shortest possible time.

Ultimately, the goal of education is to provide the tools and direction for self-actualization of the individual. By providing a specific body of knowledge, serving as a role model, and increasing student self-esteem, the faculty can enhance the process whereby professional development complements personal growth.

GRADING POLICY

Grades for the Medical Technology Practica courses are based on: (1) Student Evaluation Form, i.e. the evaluation of the student by the laboratorian(s) at clinical site, (2) Written/practical student exam from clinical sites which choose to develop and administer such exams (not all clinical sites do examinations), and (3) Written exam administered by the University. Each of these three will be given equal weight; for those sites who choose not to administer a written examination, the grade will be based on the Student Evaluation form and the written examination administered by the University.

The grading scale for Clinical Practica is as follows:

A+ - $\geq 98\%$	B+ - 87- <90%	C+ - 77 - <80%	D+ - 67 - <70%
A - 93 < 98%	B - 83 - <87%	C - 73 - <77%	D - 63 - <67%
A- - 90 < 92%	B- - 80 - <83%	C- - 70 - <73%	D- - 60 - <63%

The minimum passing grade for an undergraduate student is C-; the minimum passing grade for a graduate student is B-.

<p style="text-align: center;">DEPARTMENT POLICIES APPLICABLE TO CLINICAL LABORATORY PRACTICE</p>

Definitions:

Unsafe conduct: action(s) which poses a potential threat to the well-being, health or safety of patients, faculty, health care workers, fellow students, or self.

Unprofessional conduct: malicious, intentional or negligent action(s) which fall below, compromise or disregard the practice and ethical standards of the professional discipline, the health care community, and/or the educational climate.

Unsatisfactory performance: knowledge, skill(s) and/or time-in-practice insufficient to meet the minimum competencies, objectives, performance criteria, or scheduled experiences of the clinical practicum.

The determination of unsatisfactory performance, unprofessional conduct or unsafe conduct will be made by the faculty, who will determine when or if a student may be removed from or return to clinical or laboratory practice, the condition(s) for doing so, and the level of clinic or laboratory activity permitted. Depending on the severity of the incident(s) and/or number of prior incidents, the faculty's sanctions may result in dismissal from the program and/or department; repeating the clinical course; mandatory clinical time extensions; and/or remedial instruction prior to readmission to the department or re-entry into clinical or laboratory courses.

Department recommendations for dismissals based on clinical performance are subject to review and approval by the Committee on Student Promotions, College of Health Professions, Thomas Jefferson University. Students who wish to appeal a Departmental action, including a Departmental or Program dismissal, may do so by following the provisions of the Grade Appeal Protocol (*see College Catalog, and Student Handbook*).

POLICY FOR UNPROFESSIONAL OR UNSAFE CLINICAL LABORATORY CONDUCT

To successfully complete each clinical course, students are expected to demonstrate clinical and laboratory competencies consistent with the policies and standard procedures taught in program courses and described in course syllabi, the College's Catalog and *Student Handbook*, and the Clinical Practicum Handbook. If, in the judgment of a clinical and/or program faculty member, the student demonstrates behavior that is detrimental to the well-being of patients, fellow students, faculty members or him/herself, the student's clinical laboratory activities will be terminated

immediately. Examples of such unprofessional or unsafe conduct include, but are not limited to:

- (1) tampering with, destruction or theft of equipment, specimens or teaching materials;
- (2) verbally abusive, physically threatening or harmful behavior;
- (3) falsification of documentation (laboratory or student records);
- (4) gross interference with the educational process or health care services;
- (5) gross impairment (physical or cognitive) by illicit or prescription drugs;
- (6) inappropriate or unauthorized use of laboratory equipment, supplies, reagents, data, laboratory information systems, or communications systems;
- (7) unsupervised clinical practice or unauthorized presence in a clinical facility;
- (8) creating unnecessary risk of exposure to or harm from environmental, chemical- and/or biohazards; and
- (9) unauthorized, unreported and/or excessive absence during scheduled clinic time.

POLICY FOR UNSATISFACTORY CLINICAL PERFORMANCE

The minimum passing grade for clinical courses is C-. Students demonstrating unsatisfactory clinical performance will earn a grade less than C-. The letter grades of I (Incomplete) or IP (In progress) will not be used to extend an otherwise unsatisfactory rotation or clinical course.

A student who demonstrates unsatisfactory performance in a clinical practicum course must repeat that clinical course. The student will earn a grade of C- if he/she passes the repeated clinical course, or a grade of F if he/she does not pass. The repeat grade will be used to compute the grade point average. Students may repeat only one clinical course in this manner.

Scheduling of the repeat rotation or clinical course is subject to availability of an appropriate clinical affiliate site and adequate clinical supervision. It may be necessary for the student to wait until a rotation site becomes available. Unsatisfactory performance in the repeated rotation or clinical course may result in dismissal from the Department, in accordance with the Department's requirements for academic, clinical and technical standards (see Catalog).

<p style="text-align: center;">EFFECT OF POLICIES ON PROGRAM COMPLETION</p>

Students should recognize that penalties for unsafe, unprofessional and unsatisfactory performance; course failure; repeated courses; dismissals; make-up time; or additional assignments are likely to delay scheduled completion of program requirements, and may jeopardize scheduled eligibility for graduation, registry certification, and/or subsequent employment.

STUDENT RESPONSIBILITIES

1. SCHEDULING AND ASSIGNMENT OF CLINICAL ROTATIONS

Clinical rotations are scheduled to assure (1) a broad variety of clinical environments; (2) adequate supervision, staff interaction and representative caseload; (3) a reasonable expectation that students are able to travel to their assigned sites; and (4) that to the extent possible, student site preferences are considered during scheduling. Students may be offered the opportunity to make a preliminary selection of preferred rotation sites. In most cases, students are assigned to sites for which they have indicated a preference. However, student pre-selection of preferred rotation sites does not guarantee assignment to those sites. If the number of available clinical sites will not accommodate all students, one or more students may be assigned to an on-site, program faculty-supervised rotation in the Department's Simulation Laboratory. Scheduling for all clinical courses, including assignment to specific sites or times, is contingent on availability of an appropriate clinical affiliate site and adequate supervision.

Clinical rotations (days, times and sites) are scheduled and confirmed by the Program Faculty in consultation with Clinical Faculty. No further schedule changes can be made unless (a) the student is able to demonstrate that attendance at an assigned rotation site has or will create undue or unreasonable hardship, or (b) the Clinical Instructor must alter the schedule.

In no event is the student permitted to make his or her own arrangements for clinical rotations or to change scheduled rotation days, times or sites without a prior request to and approval by the Program Faculty and Clinical Faculty.

Students must understand that even when a clinical hardship is demonstrated, it may not be possible to assign the student to an alternate site. When this is the case, the student may choose to postpone a rotation until a site becomes available. Postponement may result in delay of program completion.

2. TRANSPORTATION AND CLINICAL EXPENSES

Students are responsible for arranging their transportation to and from clinical sites. With few exceptions, Philadelphia city and area sites are accessible using public transportation (train, bus or subway). The Department does not have the capacity to provide students with rental cars, shuttle service, fares, tokens, or parking fees, or other cash payments for meals or accommodations at clinical sites. Students selecting or assigned to distant clinical sites must arrange their own transportation and housing.

3. HEALTH CLEARANCE

No student will be approved to begin clinical practice until he/she has demonstrated that all appropriate health requirements have been met. Requirements include documentation, physical examination, and immunizations required by the University (*see* College Catalog), and any specific requirements related to the medical technology program accreditation. A student attending a clinical rotation without the appropriate Health Clearance will be immediately removed from the clinical site, and will not be allowed to resume his/her rotation until the Health Clearance is produced.

4. CLINICAL ROTATION DRESS CODES

A clean full-length lab coat is required for all students while on rotation at Thomas Jefferson University and at most other clinical sites. Professional attire should be worn at all times during clinical rotations. Tennis shoes, sandals, long dresses, T-shirts and jeans are prohibited. Jefferson student identification badges must be worn on lab coat breast pocket. NOTE: Attire at clinical sites may also require lab whites and/or appropriate sterile attire to conform with CDC Universal Precautions and/or OSHA regulations for protection against transmittal of bloodborne pathogens. Students are to confirm dress codes before beginning each rotation.

5. ABSENCES / SICK LEAVE / MAKE-UP TIME

Unless specified in the clinical schedule, there is **no** "time off" from clinical practice. Absences are recognized **only** for sick time, for doctor appointments that cannot reasonably be made during non-clinic hours, or for special circumstances *only when pre-approved by the Clinical Instructor and Program Faculty*. Students must inform **both** the Medical Technology Program Office (215-503-7933) and the Clinical Faculty member at the rotation site in the event of an absence **no later than 9:00 a.m. for each day of absence.**

- a. Any absentee time, *including time taken for job interviews*, **in excess of eight hours over the entire clinical experience**, must be made up during the term in which the absence occurs and before a grade is recorded, unless Program Faculty expressly waive this requirement and the documentation of the waiver is in writing in the student's program file.
- b. Scheduled time off **must** receive prior approval from the Program Faculty.
- c. Whenever possible, absentee time should be made up at the site from which the student was absent and should be arranged with the Clinical Instructor at that site.
- d. Program Faculty will assume absences have not been made up unless make-up time is **clearly indicated on the student's worksheets**, noted with the Clinical Instructor's signature.
- e. **Each day or part thereof of unauthorized absence will result in a 5% reduction in the final course percentage grade for the technical/professional evaluation. Students should be aware that this 5% reduction may affect successful completion of the clinical course.**

6. PROFESSIONALISM

Students are expected to abide by the guidelines incorporated in their professional Codes of Ethics, and by standards and regulations applicable to clinical laboratory practice. Students should strive to establish good working relationships with all personnel with whom they come in contact during the Clinical Practica. Students must demonstrate responsibility in the care of equipment and materials they use and the integrity and confidentiality of specimens they process during assigned clinical practica rotations. Students should seek consultation with the clinical faculty member at the rotation site for problems that may arise during their clinical practica. In the event that a problem arises that is not resolved to the satisfaction of the clinical faculty member or the student, consultation will take place with the student, clinical faculty member and the Medical Technology Program faculty.

7. DEPARTMENT, LABORATORY and AFFILIATE INSTITUTION POLICIES

Students are expected to abide by the established daily work routine and attendance schedule at the Clinical Practicum rotation site or to the schedule prepared by the Program in conjunction with Clinical Faculty.

8. DAILY WORKSHEETS: MAINTENANCE AND DOCUMENTATION

Maintenance of work records and accurate documentation of work product are essential to clinical practice in clinical laboratories.

The Medical Technology Program provides blank attendance sheets to students. Each student is responsible for maintaining this sheet and should ensure that their worksheets are reviewed and initialed by the Clinical Instructor daily during the rotation. Evaluation forms are to be completed at the completion of each rotation.

It is the student's responsibility to submit to the Program Director his/her daily attendance sheets no less than 72 hours after completion of each clinical course and/or as required for Program review. Failure to accurately document clinical work or to submit worksheets in a timely manner may result in significant point deductions, delay of grade reports or failure of the Clinical Practicum course.

9. CLINICAL AFFILIATE SITE ASSESSMENT

Students evaluate rotation sites as part of our reciprocal evaluation procedure. Students must return these forms to the Program office no more than 72 hours after completion of each rotation. Anonymous, composite evaluations are returned to each site at the completion of rotations for each academic year. A copy is maintained in the Program's Clinical Site files.

10. EMPLOYMENT INTERVIEWS

Students should make every effort to schedule appointments for job interviews on days when clinicals and classes are not scheduled. However, students in good standing may be approved for a maximum of one clinic day (8 hours) for a job interview(s) only if the following conditions are understood and met. Note that the eight hour maximum spans the entire clinical phase of the program. ***This policy should not be construed to mean one day off within each clinical course.***

- a. A request for interview time off must be submitted to the Program Faculty at least one week in advance of the tentative date of the interview.
- b. Program Faculty must pre-approve requested time off for interviews.
- c. Sick leave and/or required clinical time can not be used or substituted for interview time.
- d. Time off granted for interviews in excess of eight (8) hours must be made up. Time approved for interviews during regularly scheduled classes or clinical rotations does not excuse students from meeting requirements for that class or clinical rotation, including required time in clinical practice.
- e. Program Faculty determine where and when missed time for job interviews will be made up.

11. CAREER DEVELOPMENT CENTER

The College's Career Development Center offers a variety of career-related services, free of charge, to students of the College of Health Professions. The Center will help you set short and long range career goals, prepare a resume, write letters (such as cover and thank you letters), make contacts and schedule employment interviews, prepare for interviews, evaluate job offers, select a graduate program, and investigate financing for graduate education.

The Career Development Center keeps a list of job opportunities available to Jefferson students and graduates, including part-time work for students and full time professional positions for graduates of each program.

- The Center also provides the computerized career planning program Discover, which guides you step by step through the career evaluation and planning process.
- The Career Services Center has evening hours by appointment.
- If you wish to schedule an appointment in the Career Development Center, to talk with the Coordinator, or to use the computer, call 503-5805. You may also stop by the Career Development Center, located on the seventh floor of the Edison Building, and schedule an appointment, or browse through the materials and job listings.

12. WEATHER EMERGENCY POLICY

Should weather conditions necessitate, the Dean (or in his absence, his designee) may declare a College of Health Professions Weather Emergency. The parameters of the Weather Emergency policy are as follows:

- Once a weather emergency is declared, all on-campus and off-campus classes (clinical and non-clinical) are cancelled.
- Students scheduled to be at off-campus clinical locations should contact their immediate clinical supervisor at the rotation site to inform him/her of the Jefferson Weather Emergency.
- CHP Weather Emergencies are announced on local radio stations* as a school closing by the number 173 for daytime classes and 2173 for afternoon and evening classes (including the Department of General Studies). *Call 215-503-7844 for Department-specific information.*
- *Local radio stations using the Philadelphia School Closing Service are KYW (1060-AM); WCAU (1210-AM); WDAS (1480-AM); WDAS (105.3-FM); WPEN (950-AM).
- School closing information can be accessed online at **kyw1060.com**
- The KYW Newsradio School Closing Line is **1-900-737-1060**. Each call is \$.95.

13. STUDENT PROFESSIONAL LIABILITY COVERAGE

The College of Health Professions maintains insurance coverage for professional and general liability for all students while they are on authorized clinical affiliate assignments.

CLINICAL AFFILIATE SITE & CLINICAL FACULTY RESPONSIBILITIES

Medical Technology Clinical Faculty at clinical affiliate sites share responsibility with Program Faculty and the students themselves for the professional education of medical technology students enrolled in the College of Health Professions, Thomas Jefferson University. The Clinical Faculty occupy a key role in making the students' clinical experience a successful and meaningful one.

RESPONSIBILITIES OF CLINICAL FACILITIES

1. Demonstrate an interest in providing educational experiences to clinical laboratory science students.
2. Provide qualified personnel for the guidance and supervision of students.
3. Allow the clinical supervisor adequate time to administer, participate in and evaluate the student practica.
4. Encourage professional growth of students and staff.

GENERAL GUIDELINES FOR CLINICAL FACILITIES

To acquaint the student with your facility and with the daily operations and workflow of your laboratory, we suggest the following:

1. Give the student a brief orientation of the building (cafeteria, lounges, etc.) in which your laboratory is located.
2. Review the administrative hierarchy of your laboratory areas as well as that of the parent institution.
3. Discuss the student's daily time schedule (starting time, breaks, lunch period and quitting time). Students are expected to follow the working schedule of each laboratory.
4. Introduce the laboratory staff to the student.
 - a. Note those with whom the student will be working.
 - b. Note those to whom the student will be responsible.

5. Give the student an overview of the laboratory.
 - a. Outline the work flow pattern of the lab and the range of diagnostic tests performed.
 - b. Emphasize those tests the student will ultimately be responsible for performing.
 - c. Try to establish the order in which the student will perform tasks and tests.
 - d. Establish a flexible time schedule (by day) for performing the various tests.
6. Review the student's knowledge gained from previous course work at the University as it applies to the tests performed in your laboratory.
7. Discuss with the student who will be contributing to his/her evaluation and when the evaluation will be completed. We ask that you review the evaluation with the student and obtain his/her signature on the form.
8. Evaluate the student's performance using the evaluation forms provided by the Program in Medical Technology, Thomas Jefferson University, and return the signed evaluation forms to:

Program in Medical Technology
130 South 9th Street, Suite 1924
Thomas Jefferson University
Philadelphia, PA 19107-5233

9. Students must keep an accurate record of attendance in each laboratory area. Attendance sheets for each practicum are included in the handbook. It is the student's responsibility to have this record completed and signed by each area supervisor (or his designee) and to return the record to the program director at the end of the practicum rotation.

OBJECTIVES AND GUIDELINES FOR CLINICAL EDUCATION PRACTICA

OBJECTIVES FOR CLINICAL EDUCATION

The following objectives apply to all areas of the clinical laboratory. Specific objectives are included separately under each clinical area.

I. AFFECTIVE DOMAIN (attitudes, values, interests)

- a) The student wears appropriate protective clothing in all laboratories at all times.
- b) The student consistently arrives in the laboratory at the assigned time at the beginning of the shift and after breaks.
- c) After an appropriate orientation at the clinical facility, the student consistently adheres to safety rules in all areas of the laboratory.
- d) The student reports patient test results only to appropriate authorized persons.
- e) The student handles patient specimens carefully to avoid contamination of the specimen and himself or others in the laboratory.
- f) The student consistently cleans instruments and work counter and keeps the work area well supplied.
- g) The student performs all assigned tasks willingly.
- h) The student offers assistance to others in the laboratory when his or her work is completed or when otherwise appropriate.
- i) The student asks pertinent questions to further his or her knowledge of clinical laboratory sciences.
- j) Given assigned duties and tasks, the student works in a consistent and organized manner and completes his or her work in a timely fashion.
- k) The student will explain the importance of a quality assurance program in the clinical laboratory.

II. COGNITIVE DOMAIN (knowledge, integrating, problem-solving)

- a) The student will accurately state normal values for the various test procedures he or she is performing in the clinical laboratory.

- b) Given appropriate reagents and supplies, the student will be able to select what is needed for each test procedure he or she is performing.
- c) The student will be able to select appropriate quality control products and specimens from supplies provided in the laboratory.
- d) The student will be able to identify the proper time to collect various specimens which are sent to the laboratory.
- e) The student will be able to accurately perform routine statistical calculations used in the clinical laboratory.
- f) Given the necessary data, the student will be able to perform the calculations needed to convert findings into appropriate units for reporting.
- g) The student will be able to explain the principal and theory of the various tests he or she is performing in the clinical laboratory.
- h) After completing assigned test procedures, the student will be able to explain the clinical significance of his or her findings.
- i) When performing analyses in the laboratory, the student will recognize panic values and immediately report these findings to the appropriate authorized persons.
- j) The student will be able to select appropriate formulas for converting laboratory findings into units for reporting.
- k) After identifying abnormal results from test procedures performed, the student will be able to suggest additional tests to aid in further diagnosis of the suspected pathology.
- l) When given data generated from various divisions of the clinical laboratory, the student will be able to identify any possible discrepancies in test results.
- m) Given appropriate quality control parameters, the student will be able to evaluate the validity of test results and institute proper procedures to remedy discrepancies.

CLINICAL CHEMISTRY OBJECTIVES AND GUIDELINES

Goals

Because of the tremendous variety of clinical chemistry techniques in current use and of the wide variety and range of sophistication of instrumentation, the goals are stated in terms of desirable types of learning experiences rather than in terms of specific techniques to be mastered. These include providing the student with the opportunity to:

1. Assume responsibility for some clinical tests
2. Learn a few specific techniques thoroughly
3. Receive broad exposure to a variety of additional techniques
4. Receive exposure to techniques of laboratory operation and supervision.

Objectives

1. The student will assemble and organize all specimens, reagents, and supplies needed to perform the tests assigned.
2. The student will select all appropriate QC products before performing assigned tests.
3. After appropriate instruction, the student will routinely perform preventive maintenance procedures on those instruments to which he or she is assigned.
4. The student will prepare (where appropriate), store, and maintain the supply of reagents needed for his or her assigned workload.
5. The student will produce test results, with an acceptable level of accuracy predetermined by the laboratory, using the following types of instrumentation or methodologies (where available):
 - a. Atomic absorption spectrophotometry
 - b. Blood gas analysis
 - c. Centrifugal fast analyzer
 - d. Chromatography -- GC, Column and HPLC
 - e. Discrete analyzer
 - f. Electrophoresis
 - g. Enzyme analyzer
 - h. Multiple channel analyzer
6. After performing assigned tests, the student will evaluate QC parameters obtained and institute proper procedures to remedy discrepancies.

7. The student will routinely check instruments to which he or she is assigned for proper functioning and correct any malfunctions detected, or, when indicated, refer the problem to the appropriate person or agency.

Guidelines

The goals and objectives can be met by teaching the student some set of procedures each week such that the student can produce and be responsible for the patient runs on the procedure for the last day or two of the week. The most appropriate procedures for each laboratory, or for each week, are left to the discretion of the supervisor. We feel that the knowledge of how it feels to be responsible for patient data using a newly learned technique is as valuable a learning experience as any other in the clinical chemistry practicum.

Student Preparation

The students complete two lecture and laboratory courses at the University prior to their clinical practicum.

The student laboratory courses include:

1. Spectrophotometry: theory, calibration and operation
2. Standard colorimetric bench procedures: creatinine (Jaffe), total protein (biuret), magnesium, calcium, glucose oxidase, iron and IBC, total and direct bilirubin, cholesterol and HDL and salicylates.
3. Bench procedures for enzymatic reactions: CPK, MBX, and amylase
4. Osmometry: Freezing-point depression osmometer
5. Blood gasses and cooximetry: hands on and Corning demonstration lab
6. Potentiometric determinations: ISE (Novo demonstration) and hands on chloride titrater
7. Electrophoresis and densitometry: Each student worked with normal and abnormal serum proteins.
8. Extraction using organic solvents: porphobilinogen and urobilinogen
9. Drugs of abuse: qualitative evaluation of urine using triage bedside testing
10. Chemiluminescence: cortisol and LH
11. Pregnancy: beta HCG using target method
12. Use of the following equipment: spectrophotometer, densitometer, pH meter, vortex mixer, electronic balance, heating blocks, pipette washer and dryer, distilled water apparatus, cuvettes, calibrated glassware and serological, volumetric and automatic pipettes.
13. Use of the following safety equipment and precautions: lab coats, safety glasses, gloves, fume hood, eyewash station, sharps and waste disposal, benching cleaning with bleach, hand washing and chemical safety.

14. Use of the following lab math: acid-base problems, Beer's law, calibration and standard curves, conversion between units (mg%, mM/L and mEq/L), determination of mean, SD and CV from class generated data and calculation of creatinine clearance using body-surface area

With the framework of the suggestions made above, it would be desirable, if possible to teach, or at least to expose the student to some of the following instrumentation or activities:

1. Atomic absorption spectrophotometry
2. Electrophoresis
3. Gamma Counter and RIA
4. Chromatography-GC, Column and HPLC
5. Blood gas analysis, with emphasis on sample handling technique, care of instrument, and review of interpretation of results.
6. Enzyme analyzer on modern instruments - analysis of enzymes (manual or automated)
7. Discrete analyzer
8. Centrifugal Fast Analyzer
9. Multiple channel analyzer
10. Instrumental and/or procedural trouble shooting activities.

LEARNING EXPERIENCES- CHEMISTRY

While in the clinical laboratory, the student is expected to participate in the routine activities of that laboratory.

GUIDELINES:

Perform instrument set-up for all routine analyzers. Students are told that they

Run daily controls and evaluate for acceptability.

Evaluate specimens for suitability for testing.

Perform necessary specimen preparation for testing.

Run patient specimens for all routine testing and evaluate results.

Perform electrophoresis and evaluate results.

Perform blood gases.

Perform chemical analyses on body fluids other than serum/plasma, if sufficient specimen is available.

Perform therapeutic drug analyses.

HEMATOLOGY OBJECTIVES AND GUIDELINES

Goals

Routine hematological tests, although previously covered in lecture and student lab, should be performed by the student during clinical practicum so that the student can:

1. Collect and perform the CBC and differential (as it is done in your particular lab).
2. Use different techniques and/or equipment available for performing routine tests, i.e. platelet counting, ESR, sickle cell screening, etc.
3. Perform quality control procedures.
4. Relate test results to patient conditions.
5. Report accurate and precise results.
6. Increase skill and speed in performing hematologic tests.
7. Develop organizing ability.

Objectives

1. After appropriate instruction and orientation, the student will assemble reagents and supplies needed to collect requested blood samples.
2. Given selected specimens, the student will gather the reagents, supplies, and QC products needed to perform a CBC and differential.
3. The student will perform the following tests, with an acceptable level of accuracy predetermined by the laboratory, on selected specimens:
 - a. CBC
 - b. Differential
 - c. PT and APTT
 - d. Platelet count
 - e. ESR
 - f. Sickle cell screen
 - g. Fibrin Split Products and/or D-Dimer
 - h. Fibrinogen
 - i. Special coagulation studies as available (e.g. Anti-thrombin III, factor assays, platelet studies)

4. After appropriate instruction, the student will routinely perform preventive maintenance procedures on those instruments to which he or she is assigned.
5. The student will prepare (where appropriate), store, and maintain the supply of reagents needed for his or her assigned workload.
6. After performing assigned tests, the student will evaluate QC parameters obtained and institute proper procedures to remedy discrepancies.
7. The student will review instrument components, principle of operation, and limitations for those instruments to which he is assigned.
8. The student will routinely check instruments to which he or she is assigned for proper functioning and correct any malfunctions detected, or, when indicated, refer the problem to the appropriate person or agency.
9. The student will interpret results of tests performed, including scatter plots/ scatter grams for automated differentials.

Guidelines

The amount of time each student spends on performance of routine tests should vary with the student's ability to satisfy the criteria mentioned above. This should be decided by the technologist supervising the student. Emphasis should be placed on performance of differentials.

Student Preparation

The students complete two 3-credit courses in hematology, prior to the clinical practicum. Each course consists of two hours of lecture and 2-hour lab each week for the 15 week term. These courses involve the study of the formation and development of blood and its coagulation mechanism, including diagnostic tests, methods, and instruments used.

LEARNING EXPERIENCES- HEMATOLOGY

While in the clinical laboratory, the student is expected to participate in the routine activities of that laboratory.

GUIDELINES:

Perform AT LEAST 5 normal differentials, 5 differentials with abnormal rbc morphology, and 10 differentials with abnormal wbc's, at least 3 of them leukemias.

Student results must be consistent with the laboratory's criteria for reproducibility.

Perform instrument set-up.

Run daily controls and evaluate for acceptability.

Evaluate specimens for suitability for testing.

Perform necessary specimen preparation for testing.

Run and evaluate scattergrams for at least 15 patients, normal and abnormal.

Set up an erythrocyte sedimentation rate (ESR).

COAGULATION:

Perform instrument set-up.

Run daily controls and evaluate for acceptability.

Evaluate specimens for suitability for testing.

Perform necessary specimen preparation for testing.

Run and evaluate PT's and APTT's.

Run fibrinogen/thrombin and D-dimer.

Participate in unusual testing, such as factor assays and hemoglobin electrophoresis*, if available.

*Note: If electrophoresis is performed in chemistry, and the student is scheduled for chemistry at the same facility, this can be done in chemistry.

URINALYSIS OBJECTIVES AND GUIDELINES

Goals

During the clinical practicum the student should perform routine urinalysis examinations so that the student can:

1. Demonstrate knowledge of formed elements seen in urinary sediments.
2. Perform various procedures for the qualitative and quantitative measure of substances found in urine.
3. Participate in quality control procedures.
4. Relate test results to patient conditions.

Objectives

1. The student will gather appropriate reagents and supplies needed to perform:
 - a. a manual macroscopic routine urinalysis
 - b. an automated routine urinalysis.
2. The student will gather and organize the reagents and supplies needed to perform a microscopic urinalysis.
3. The student will accurately perform the following tests:
 - a. Acetest
 - b. Clinitest
 - c. Ictotest
 - d. Sulfosalicylic Acid test
4. Given urine sediments for which the results were previously determined by the laboratorian, the student will identify the various formed elements present with 95 % accuracy.
5. Given urine specimens which have not been previously tested, the student will perform routine testing methods within an acceptable time frame.
6. Given the results of reagent strip tests, the student will perform appropriate confirmatory procedures on selected urine specimens as done in the particular laboratory.

The amount of time each student spends on the performance of routine tests should vary with the student's ability to satisfy the above criteria, and is left to the discretion of the supervisor. Emphasis should be placed upon recognition of microscopic elements.

Student Preparation

The students complete a 1-credit course in biologic fluids, which is approximately 2/3 urinalysis prior to their clinical practicum. This course is taught in the Program in Medical Technology at Thomas Jefferson University and includes:

1. The principles of all reagent strip and tablet screening tests commonly performed in clinical urinalysis laboratories.
2. Lectures covering the classical manual procedures for qualitatively and quantitatively measuring substances found in urine.
3. Laboratory sessions in which students use reagent test strips and tablets and measure specific gravity by the refractometer.
4. Lab sessions in which students study slides of formed elements.

Guidelines

As guidelines for the objectives to be accomplished we ask that the student:

1. Perform routine urinalysis testing as it is performed in the particular laboratory.
3. Report accurate, precise results.
4. Participate in quality control procedures.

URINALYSIS/BODY FLUIDS:

Perform instrument set-up.

Run daily controls and evaluate for acceptability.

Perform complete urinalysis, including microscopic.

Perform a fluid cell count, if extra fluid is available.

IMMUNOHEMATOLOGY OBJECTIVES AND GUIDELINES

Goals

The primary objective of the Blood Bank clinical practicum is for the student to develop technical accuracy and self-confidence by clinically experiencing routine functions of an immunohematology laboratory. Supervisors will stimulate deductive thinking by guiding the student into answering his/her own questions, recognizing and resolving discrepancies, and applying theory in the clinical environment.

Objectives

1. The student will gather reagents and supplies needed to perform the following procedures:
 - a. ABO and RH typing
 - b. Compatibility testing
 - c. Direct antiglobulin test
 - d. Antigen typing
 - e. Rh globulin work-up
 - f. Antibody screening and identification
 - g. Absorption and elution techniques
2. The student will observe the following procedures:
 - a. issuing of blood or blood derivatives for transfusion purposes
 - b. preliminary transfusion reaction investigation procedures
 - c. inventory of blood supplies
 - d. administration of blood components
 - e. quality control
3. The student will prepare appropriate red blood cell suspensions for testing.
4. Given specimens for which the results were previously determined by the laboratorian, the student will perform ABO and Rh typing with no errors.
5. Using specimens and reagents provided, the student will identify the specificity of an antibody with 90% accuracy.
6. Using specimens and reagents provided, the student will perform compatibility tests with no errors.
7. Given selected patient specimens, the student will perform ABO and Rh typings, detect any discrepancies and suggest possible solutions.
8. Given selected patient specimens, the student will recognize rouleaux and hemolysis while reading reactions and give plausible explanations for their occurrence.
9. When performing Rh testing on selected specimens, the student will be able to resolve a positive Rh₀ control, if used.

Guidelines

A period of orientation is recommended at the beginning of the clinical practicum.

During this time the student should practice the following:

1. Organization of test tubes for performing multiple tests.
2. Preparation of red blood cell suspensions for testing.
3. Reading strengths of agglutination reactions.
4. Washing test tubes for antiglobulin tests.

Student Preparation

Students complete all coursework in Immunohematology prior to their clinical practicum. The course in blood banking, MT 352 Immunohematology, is taught in the Department of Laboratory Sciences, College of Health Professions, Thomas Jefferson University and consists of three hours of lecture and a minimum 2-hour lab weekly, during Spring Term. Emphasis is on serological and cellular antigens and antibodies, including the theories of blood banking, cell typing, and antibody identification.

CLINICAL IMMUNOHEMATOLOGY ROTATION

STUDY QUESTIONS

Prior to entering the rotation in clinical immunohematology, each student must have satisfactorily completed prerequisite skills. These skills are acquired through independent readings before the start of each individual contract, (laboratory manual and references), along with the MT 352 Immunohematology lecture and student lab course.

I-1 Quality Control; Distribution; Donor Processing

Objectives:

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

1. Conduct and maintain quality control procedures on equipment, reagents and products by designing and implementing instrument, reagent and product check systems; analyze data and interpret results, implementing corrective actions when indicated.
2. Select control samples appropriate to monitor procedures.
3. Compare proficiency testing programs: internal and external.
4. Establish and maintain recordkeeping systems (i.e. specimen accession and retention, instrument maintenance, quality control samples).
5. Discuss the procedures performed with daily, monthly and periodic quality control in terms of specificity, sensitivity and reactivity.
6. Describe titer and its role in blood bank.
7. List factors which result in false positive and/or false negative direct antihuman globulin tests.
8. Discuss the purpose and preparation of Coombs control cells and complement sensitized cells.
9. Assess and/or respond to clinical considerations to rank the order of performance of procedures. (routine, STAT, diagnosis and for treatment).

10. Obtain patient information by review of medical records as pertinent to test performance and/or evaluation of results (drugs administered, pregnancy status).
11. Inspect and evaluate suitability of a specimen for the analysis requested, fulfilling all internal and external policies and regulations.
12. Maintain an environmentally safe work area.
13. Discuss the procedures for processing ARC and hospital-collected units, as well as washing, freezing and thawing of RBC.

Learning Experiences

- __1. Read a minimum of two of the listed references.
- __2. Review Q.C.: Observe both daily and weekly checks on the refrigerators and reagents used in the blood bank.
 - a. Recording reagent source, lot, reactivity & specificity
 - b. Recording temperatures of refrigerators and alarm clocks.
 - c. Recording temperatures of incubators used during rotation in Quality Control.
 - d. Changing the refrigerator charts.
- __3. Observe how to log in specimens, answer phones, thaw fresh frozen plasma, hand out components, preparation of components for patient use.
- __4. Help log in specimens, units, answer phones and retrieve information, thaw fresh frozen plasma, prepare components for patient use, hand out components. Determine if a specimen is acceptable.
- __5. Help log in all units of blood received from ARC and other sources.
- __6. Observe (and perform, if possible) the processing of ARC(American Red Cross) donor units, including labeling and recordkeeping.
- __7. Answer the following study questions.

References:

1. AABB: Technical Manual
2. Harmening: Modern Blood Banking and Transfusion Practices
3. Lab Manual(SOP)

I-2 Compatibility Testing

Objectives

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

1. Discuss the procedures involved in a routine crossmatch and a "problem" crossmatch(e.g. patients with antibodies, patients with panagglutinable serum).
2. Recognize and list common interactions which may be detected by the crossmatching test.
3. State the reasons for false negative and/or false positive crossmatch results.
4. Complete compatibility testing, including a 4 unit crossmatch, on one patient in one hour or less.
5. Recognize reasons for cases where all donors seem incompatible.
6. List the type of transfusion reactions along with their symptoms.
7. Perform and interpret an alleged transfusion reaction workup.
8. List the steps necessary for safe transfusion.
9. Explain the procedure for the release of uncrossmatched blood.
Differentiate between emergency situations and massive transfusion.

Learning Experiences

1. Read a minimum of 2 of the listed references.
2. Under the supervision of a technologist perform a minimum of 10 multiple unit crossmatches; be able to do each of them within one hour's time. Have the technologist check your results.
3. Answer the following study question.

I-3 Independent Blood Bank - Antibody Identification

Behavioral Objectives

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

1. Resolve any discrepancies in forward and reverse ABO grouping using any of the following procedures: anti A, B, lectins, absorbed serum, absorption-elution technique, secretor studies and modification of ABO grouping methods.
2. Discuss the role of antigen-antibody reactions in Hemolytic disease of the Newborn, transfusion reactions and multiple transfusions.
3. Perform workup to determine Hemolytic Disease of the Newborn, to determine maternal eligibility for Rh immunoglobulin. Select appropriate blood for transfusion and exchange transfusion of the baby.
4. Identify single and multiple antibodies in patient specimens.

Learning Experiences

1. Read a minimum of 2 of the listed sources
2. Perform at least one single and one multiple antibody identification
3. Determine Rho (D) Immune Globulin eligibility.
4. Perform HDN work-up.
5. Answer all the study questions.

I-4 Independent Blood Bank - Donor Selection and Blood Components

Behavioral Objectives

Upon completion of the rotation, the students will be able to:

1. Maintain records of donation in accordance with applicable regulations.
2. Determine donor eligibility, recognizing those procedures which require general medical knowledge; situations when regulations require that a physician's consent is obtained.
3. Perform donor screening and prepare for phlebotomy.
4. Appraise unit to see if it meets the volume set forth by the AABB and FDA standards.
5. Describe donor criteria, defining acceptable limits.
6. State the procedure for preparing an arm for phlebotomy.
7. List and define the possible reactions a donor might experience (symptoms and treatment).
8. Follow an established protocol to yield a blood product which meets acceptable quality in terms of regulations, potency, viability, safety and established quality assurance.
9. Convey information to the user regarding blood products (i.e., indication, biological characteristics, quality of the product and utilization parameters).
10. Explain the difference between an open and a closed system for obtaining components.
11. Define the outdates and storage temperatures for blood products including whole blood, cryoprecipitate, packed red cells, FFP, platelets, frozen washed RBC and white blood cells.
12. Discuss the therapeutic advantages to the use of blood components and derivatives as compared to whole blood.
13. Describe the basic principles of operation of the Heamonectics system for pheresis and cite examples where pheresis may be indicated.

Learning Experiences

- __1. Read a minimum of 2 of the listed references.
- __*2. Observe how to register a donor and obtain donor history:
- __*3. Observe a venipuncture site preparation, materials and instruments needed.
- __*4. Observe care of a donor during and after donation.
- __*5. Observe the Heamonetics blood processor.
- __*6. Observe anticoagulant used for collection of WBC and platelets.
- __7. Answer the following study questions.

References

1. AABB: Technical Manual
2. AABB: Circular of Information for the Use of Human Blood and Blood Components
3. Lab Manual

*Observations are not required. However, if the student is at a clinical facility that draws blood/platelet donors, students are encouraged to observe.

MICROBIOLOGY OBJECTIVES AND GUIDELINES

Goals

Microbiological examinations (although basically covered in the lecture and student laboratories) should be performed by the student during the clinical practicum so that the student can:

1. Choose appropriate media for various clinical specimens.
2. Plant and process specimens.
3. Identify microorganisms encountered in the clinical laboratory.
4. Demonstrate knowledge of environmental influences on microbial growth.
5. Differentiate between normal flora and pathogens.
6. Interpret antimicrobial sensitivity patterns.
7. Apply methods of sterile technique in the laboratory at all times.

Objectives

1. The student will select appropriate media for planting all specimens he or she is assigned.
2. The student will determine appropriate incubation temperatures and atmospheric requirements for all specimens he or she is assigned.
3. The student will select and organize the reagents, supplies, and materials needed to process, plant, and identify all specimens he or she is assigned.
4. The student will use methods of sterile technique in the laboratory at all times.
5. The student will differentiate between normal flora and possible pathogens in various clinical specimens he or she is assigned.
6. Given selected specimens, the student will process, plant, and incubate them appropriately.
7. Given- selected cultures, the student will perform the tests and procedures necessary to accurately identify all pathogenic bacteria (both aerobes and anaerobes), fungi, parasites, and viruses present.
8. The student will perform and accurately interpret antimicrobial sensitivity testing on all appropriate cultures.

9. Given selected specimens, the student will work independently to identify the pathogens present, interpret results, and report appropriate findings.
10. The student will correlate identification of pathogens with antimicrobial sensitivity patterns and perform appropriate tests to remedy any discrepancies.

Guidelines

As guidelines for the objectives to be accomplished, we ask that the student:

1. Plant and process specimens both aerobically and anaerobically.
2. Read cultures and learn protocol for identification of microorganisms and pattern recognition of common isolates.
3. Perform testing for identification of fungi and parasites.
4. Read and perform antibiotic susceptibility tests.
5. Log specimens and record and report appropriate results.
6. Participate in quality control procedures.

The amount of time any one student spends in any of the above areas is left to the discretion of the clinical supervisor. However, it is necessary that students do spend some time in all facets of activity in Microbiology.

Student Preparation

The students complete two 3-credit courses in microbiology prior to their clinical practicum.

In the student laboratories in microbiology and parasitology, the following techniques, procedures, media and organisms are used:

A. Organisms

- | | |
|----------------------------------|------------------------------------------------|
| 1. Erysipelothrix | 8. <i>Neisseria</i> |
| 2. <i>Bacillus</i> | 9. Nonfermenting and unusual gramnegative rods |
| 3. Diptheroids | 10. Parasites |
| 4. Enterobacteriaceae | 11. <i>Staphylococcus</i> |
| 5. Fungi (common contaminants) | 12. <i>Streptococcus</i> |
| 6. <i>Haemophilus</i> | 13. Yeasts |
| 7. <i>Listeria monocytogenes</i> | |

B. Media

1. Plated Media

- a. Chocolate Agar
- b. Columbia CNA agar
- c. Sheep blood Agar
- d. Hektoen Enteric medium
- e. MTM media
- f. Mueller Hinton agar
- g. Bile esculin
- h. MacConkey medium

2. Tubed Media

- a. Haemophilus quad plates
- b. . Phenylalanine deaminase
- c. CTA medium and carbohydrates
- d. Decarboxylase media
- e. Esculin agar
- f. Lysine iron agar
- g. MIO medium
- h. Nitrate broth
- i. Salt tolerance media
- j. Simmons citrate agar
- k. Thioglycollate medium
- l. Trypticase soy broth
- m. Kligler's agar
- n. Urea agar
- o. OF media
- p. nutrient gelatin

3. Techniques and procedures

- a. API 20 E
- b. Gram stain
- c. Bauer-Kirby antibiotic sensitivity test
- d. Carbohydrate assimilation
- e. Catalase
- f. Coagulase
- g. Isolation streaking
- h. Novobiocin resistance
- i. germ tube
- j. Optochin sensitivity
- k. Oxidase

IMMUNOPATHOLOGY OBJECTIVES AND GUIDELINES

Goals

The primary objective of the Immunopathology clinical practicum is for the student to develop technical skills and accuracy by performing the routine immunological procedures that were performed in the student laboratory and review the principle of the test system as discussed in lecture. Exposure, by observation or limited hands-on experience, of the more sophisticated techniques in Immunology will also take place. Immunology procedures are to include both testing for infectious disease and testing for immunologic/autoimmune disease.

Objectives

1. The student will gather appropriate reagents, supplies, and QC products needed to perform the routine immunologic procedures.
2. The student will perform, with an acceptable level of accuracy as predetermined by the laboratory, the following tests:
 - a) RPR
 - b) Monospot
 - c) ELISA method for infectious disease
 - d) other routine Immunologic testing as available
3. The student will observe or have limited hands-on experience with the following tests as available:
 - a) ANA
 - b) ELISA or other enzyme immunoassays
 - c) other Indirect Fluorescent Antibody assays
 - d) Hepatitis testing
 - e) other tests as available
4. The student will store and maintain the supply of reagents needed or his or her assigned workload.
5. After performing assigned tests, the student will evaluate QC parameters obtained and institute proper procedures to remedy discrepancies.
6. The student will relate test results to patient conditions.

Guidelines

The amount of time each student spends on performance of routine tests should vary with the student's ability to satisfy the criteria as predetermined by the technologist supervising the student.

Student Preparation

The students complete a 3 credit course in Immunology prior to the clinical practicum. The course consists of three hours of lecture each week with some laboratory exposure to certain techniques during the fall semester. The course involves discussion of the structure, function, and generation of antibodies, cellular recognition, response and regulation of the immune response. Immunological diagnostic testing is discussed using clinical correlation. The course also covers hypersensitivity, autoimmunity, transplantation, and tumor immunology.

EVALUATION FORMS

THOMAS JEFFERSON UNIVERSITY
College of Health Professions / Department of Bioscience Technologies
Medical Technology Clinical Practicum Courses
EVALUATION OF STUDENT BY CLINICAL SITE

Clinical Site _____ Student: _____
Lab Section _____ Date _____
Rotation Dates(from/to): _____ Evaluator: _____

Instructions: Please rate the student on each item below by circling the appropriate number on the rating scale. Space is provided after each statement for any comments you may wish to add.

The rating scale is:

0	1	2	3	4	5
does not apply	never/ very poor	occasionally/ needs assistance	average/ typically	very good/ consistently	outstanding

COOPERATION

- | | | | | | | |
|---------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|
| 1. The student performs assigned tasks willingly. | 0 | 1 | 2 | 3 | 4 | 5 |
| 2. The student offers assistance to others when appropriate and/or willingly assists others when asked. | 0 | 1 | 2 | 3 | 4 | 5 |

PUNCTUALITY

- | | | | | | | |
|----------------------------------------------------------------------------------------------|---|---|---|---|---|---|
| 3. The student arrives in the lab on time in the morning, after lunch, or after breaks. | 0 | 1 | 2 | 3 | 4 | 5 |
| 4. The student notifies the supervisor before arrival time if he/she will be absent or late. | 0 | 1 | 2 | 3 | 4 | 5 |

INTERPERSONAL RELATIONS

- | | | | | | | |
|------------------------------------------------------------------------|---|---|---|---|---|---|
| 5. The student accepts constructive criticism and follows suggestions. | 0 | 1 | 2 | 3 | 4 | 5 |
| 6. The student is congenial with co-workers and staff. | 0 | 1 | 2 | 3 | 4 | 5 |
| 7. The student is able to communicate effectively with co-workers | 0 | 1 | 2 | 3 | 4 | 5 |

PROFESSIONAL PRACTICES

- | | | | | | | |
|-------------------------------------------------------------------------------|---|---|---|---|---|---|
| 8. The student respects the confidentiality of patient test results. | 0 | 1 | 2 | 3 | 4 | 5 |
| 9. The student wears protective clothing e.g., lab coat, safety glasses, etc. | 0 | 1 | 2 | 3 | 4 | 5 |

The rating scale is:	0 does not apply	1 never/ very poor	2 occasionally/ needs assistance	3 average/ typically	4 very good/ consistently	5 outstanding
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TECHNICAL SKILLS

10. The student handles patient specimens carefully to avoid spillage and or contamination of the specimen, himself, or others in the laboratory.	0	1	2	3	4	5
11. The student handles laboratory equipment and reagents carefully and has avoided excessive breakage and or spillage.	0	1	2	3	4	5
12. The student cleans instruments and work counter after use.	0	1	2	3	4	5
13. The student uses laboratory equipment properly.	0	1	2	3	4	5
14. The student records results accurately and legibly.	0	1	2	3	4	5
15. The student works orderly and systematically on those tests to which he/she is assigned.	0	1	2	3	4	5
16. When informed that he/she is performing a technique improperly, the student works to improve the technique.	0	1	2	3	4	5
17. The student is able to work with only minimal supervision.	0	1	2	3	4	5
18. When performing laboratory tests, the student produces accurate and precise results.	0	1	2	3	4	5
19. The student displays manual dexterity in performing test procedures.	0	1	2	3	4	5
20. The student performs test procedures with reasonable speed while maintaining accuracy.	0	1	2	3	4	5
21. The student is able to assist with set up of automated analyzers.	0	1	2	3	4	5
22. The student is able to assist in organizing specimens in appropriate order by priority.	0	1	2	3	4	5

THEORETICAL KNOWLEDGE

23. The student recognizes his/her erroneous results	0	1	2	3	4	5
24. The student can offer reasonable explanations as to why he/she obtained erroneous test results.	0	1	2	3	4	5

The rating scale is:	0 does not apply	1 never/ very poor	2 occasionally/ needs assistance	3 average/ typically	4 very good/ consistently	5 outstanding
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25. The student recognizes abnormal test results	0	1	2	3	4	5
26. The student relates abnormal test results to pathological conditions.	0	1	2	3	4	5
27. The student seeks to further his/her understanding by asking questions or reading relevant materials during slack periods.	0	1	2	3	4	5

ADDITIONAL COMMENTS:

1. In what area(s) did the student demonstrate outstanding ability(ies)?

2. In what area(s) do you feel the student needs to improve?

OVERALL PERFORMANCE

Was the student's overall performance in your lab **Satisfactory** or **Unsatisfactory**? (Circle one).

If unsatisfactory, what recommendations would you make to help the student perform as an entry level medical technologist?

Student's Signature _____
 Evaluator's Signature _____
 Date _____

THOMAS JEFFERSON UNIVERSITY
College of Health Professions / Department of Bioscience Technologies
Medical Technology Clinical Practicum Courses
EVALUATION OF STUDENT BY CLINICAL SITE

Clinical Site _____ Student: _____
Lab Section _____ Date _____
Rotation Dates(from/to): _____ Evaluator: _____

Instructions: Please rate the student on each item below by circling the appropriate number on the rating scale. Space is provided after each statement for any comments you may wish to add.

The rating scale is:

0	1	2	3	4	5
does not apply	never/ very poor	occasionally/ needs assistance	average/ typically	very good/ consistently	outstanding

COOPERATION

- | | | | | | | |
|---------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|
| 1. The student performs assigned tasks willingly. | 0 | 1 | 2 | 3 | 4 | 5 |
| 2. The student offers assistance to others when appropriate and/or willingly assists others when asked. | 0 | 1 | 2 | 3 | 4 | 5 |

PUNCTUALITY

- | | | | | | | |
|----------------------------------------------------------------------------------------------|---|---|---|---|---|---|
| 3. The student arrives in the lab on time in the morning, after lunch, or after breaks. | 0 | 1 | 2 | 3 | 4 | 5 |
| 4. The student notifies the supervisor before arrival time if he/she will be absent or late. | 0 | 1 | 2 | 3 | 4 | 5 |

INTERPERSONAL RELATIONS

- | | | | | | | |
|------------------------------------------------------------------------|---|---|---|---|---|---|
| 5. The student accepts constructive criticism and follows suggestions. | 0 | 1 | 2 | 3 | 4 | 5 |
| 6. The student is congenial with co-workers and staff. | 0 | 1 | 2 | 3 | 4 | 5 |
| 7. The student is able to communicate effectively with co-workers | 0 | 1 | 2 | 3 | 4 | 5 |

PROFESSIONAL PRACTICES

- | | | | | | | |
|-------------------------------------------------------------------------------|---|---|---|---|---|---|
| 8. The student respects the confidentiality of patient test results. | 0 | 1 | 2 | 3 | 4 | 5 |
| 9. The student wears protective clothing e.g., lab coat, safety glasses, etc. | 0 | 1 | 2 | 3 | 4 | 5 |

The rating scale is:	0 does not apply	1 never/ very poor	2 occasionally/ needs assistance	3 average/ typically	4 very good/ consistently	5 outstanding
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TECHNICAL SKILLS

10. The student handles patient specimens carefully to avoid spillage and or contamination of the specimen, himself, or others in the laboratory.	0	1	2	3	4	5
11. The student handles laboratory equipment and reagents carefully and has avoided excessive breakage and or spillage.	0	1	2	3	4	5
12. The student cleans instruments and work counter after use.	0	1	2	3	4	5
13. The student uses laboratory equipment properly.	0	1	2	3	4	5
14. The student records results accurately and legibly.	0	1	2	3	4	5
15. The student works orderly and systematically on those tests to which he/she is assigned.	0	1	2	3	4	5
16. When informed that he/she is performing a technique improperly, the student works to improve the technique.	0	1	2	3	4	5
17. The student is able to work with only minimal supervision.	0	1	2	3	4	5
18. When performing laboratory tests, the student produces accurate and precise results.	0	1	2	3	4	5
19. The student displays manual dexterity in performing test procedures.	0	1	2	3	4	5
20. The student performs test procedures with reasonable speed while maintaining accuracy.	0	1	2	3	4	5
21. The student is able to assist with set up of automated analyzers.	0	1	2	3	4	5
22. The student is able to assist in organizing specimens in appropriate order by priority.	0	1	2	3	4	5

THEORETICAL KNOWLEDGE

23. The student recognizes his/her erroneous results	0	1	2	3	4	5
24. The student can offer reasonable explanations as to why he/she obtained erroneous test results.	0	1	2	3	4	5

The rating scale is:	0 does not apply	1 never/ very poor	2 occasionally/ needs assistance	3 average/ typically	4 very good/ consistently	5 outstanding
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25. The student recognizes abnormal test results	0	1	2	3	4	5
26. The student relates abnormal test results to pathological conditions.	0	1	2	3	4	5
27. The student seeks to further his/her understanding by asking questions or reading relevant materials during slack periods.	0	1	2	3	4	5

ADDITIONAL COMMENTS:

1. In what area(s) did the student demonstrate outstanding ability(ies)?

2. In what area(s) do you feel the student needs to improve?

OVERALL PERFORMANCE

Was the student's overall performance in your lab **Satisfactory** or **Unsatisfactory**? (Circle one).

If unsatisfactory, what recommendations would you make to help the student perform as an entry level medical technologist?

Student's Signature _____

Evaluator's Signature _____

Date _____

THOMAS JEFFERSON UNIVERSITY
College of Health Professions / Department of Bioscience Technologies
Medical Technology Clinical Practicum Courses
EVALUATION OF STUDENT BY CLINICAL SITE

Clinical Site _____ Student: _____
Lab Section _____ Date _____
Rotation Dates(from/to): _____ Evaluator: _____

Instructions: Please rate the student on each item below by circling the appropriate number on the rating scale. Space is provided after each statement for any comments you may wish to add.

The rating scale is:

0	1	2	3	4	5
does not apply	never/ very poor	occasionally/ needs assistance	average/ typically	very good/ consistently	outstanding

COOPERATION

- | | | | | | | |
|---------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|
| 1. The student performs assigned tasks willingly. | 0 | 1 | 2 | 3 | 4 | 5 |
| 2. The student offers assistance to others when appropriate and/or willingly assists others when asked. | 0 | 1 | 2 | 3 | 4 | 5 |

PUNCTUALITY

- | | | | | | | |
|----------------------------------------------------------------------------------------------|---|---|---|---|---|---|
| 3. The student arrives in the lab on time in the morning, after lunch, or after breaks. | 0 | 1 | 2 | 3 | 4 | 5 |
| 4. The student notifies the supervisor before arrival time if he/she will be absent or late. | 0 | 1 | 2 | 3 | 4 | 5 |

INTERPERSONAL RELATIONS

- | | | | | | | |
|------------------------------------------------------------------------|---|---|---|---|---|---|
| 5. The student accepts constructive criticism and follows suggestions. | 0 | 1 | 2 | 3 | 4 | 5 |
| 6. The student is congenial with co-workers and staff. | 0 | 1 | 2 | 3 | 4 | 5 |
| 7. The student is able to communicate effectively with co-workers | 0 | 1 | 2 | 3 | 4 | 5 |

PROFESSIONAL PRACTICES

- | | | | | | | |
|-------------------------------------------------------------------------------|---|---|---|---|---|---|
| 8. The student respects the confidentiality of patient test results. | 0 | 1 | 2 | 3 | 4 | 5 |
| 9. The student wears protective clothing e.g., lab coat, safety glasses, etc. | 0 | 1 | 2 | 3 | 4 | 5 |

The rating scale is:	0 does not apply	1 never/ very poor	2 occasionally/ needs assistance	3 average/ typically	4 very good/ consistently	5 outstanding
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TECHNICAL SKILLS

10. The student handles patient specimens carefully to avoid spillage and or contamination of the specimen, himself, or others in the laboratory.	0	1	2	3	4	5
11. The student handles laboratory equipment and reagents carefully and has avoided excessive breakage and or spillage.	0	1	2	3	4	5
12. The student cleans instruments and work counter after use.	0	1	2	3	4	5
13. The student uses laboratory equipment properly.	0	1	2	3	4	5
14. The student records results accurately and legibly.	0	1	2	3	4	5
15. The student works orderly and systematically on those tests to which he/she is assigned.	0	1	2	3	4	5
16. When informed that he/she is performing a technique improperly, the student works to improve the technique.	0	1	2	3	4	5
17. The student is able to work with only minimal supervision.	0	1	2	3	4	5
18. When performing laboratory tests, the student produces accurate and precise results.	0	1	2	3	4	5
19. The student displays manual dexterity in performing test procedures.	0	1	2	3	4	5
20. The student performs test procedures with reasonable speed while maintaining accuracy.	0	1	2	3	4	5
21. The student is able to assist with set up of automated analyzers.	0	1	2	3	4	5
22. The student is able to assist in organizing specimens in appropriate order by priority.	0	1	2	3	4	5

THEORETICAL KNOWLEDGE

23. The student recognizes his/her erroneous results	0	1	2	3	4	5
24. The student can offer reasonable explanations as to why he/she obtained erroneous test results.	0	1	2	3	4	5

The rating scale is:	0 does not apply	1 never/ very poor	2 occasionally/ needs assistance	3 average/ typically	4 very good/ consistently	5 outstanding
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25. The student recognizes abnormal test results	0	1	2	3	4	5
26. The student relates abnormal test results to pathological conditions.	0	1	2	3	4	5
27. The student seeks to further his/her understanding by asking questions or reading relevant materials during slack periods.	0	1	2	3	4	5

ADDITIONAL COMMENTS:

1. In what area(s) did the student demonstrate outstanding ability(ies)?

2. In what area(s) do you feel the student needs to improve?

OVERALL PERFORMANCE

Was the student's overall performance in your lab **Satisfactory** or **Unsatisfactory**? (Circle one).

If unsatisfactory, what recommendations would you make to help the student perform as an entry level medical technologist?

Student's Signature _____

Evaluator's Signature _____

Date _____

THOMAS JEFFERSON UNIVERSITY
College of Health Professions / Department of Bioscience Technologies
Medical Technology Clinical Practicum Courses
STUDENT EVALUATION OF CLINICAL EDUCATION

Check Applicable Microbiology Chemistry Hematology

Rotation: Immunohematology Immunopathology Other (*Specify*) _____

Student Name: [please print] _____

HOSPITAL _____ SECTION _____ TERM _____ YEAR _____

Name(s) of those to whom you were directly responsible [*list first and last name(s)*]:

I. Overview: Check the description that most closely represents your evaluation of the facility.

1. Were your student responsibilities and privileges reviewed with you?

- _____ Very clearly presented.
- _____ Adequately discussed. Knew what was expected of me on a day-to-day basis.
- _____ In general, I knew what was expected of me on a day-to-day basis. Occasionally unclear as to my responsibilities.
- _____ Unclear. Left confusion in my mind as to what was expected of me.

2. Were you conscious of a well-planned program for students in this facility?

- _____ Excellent program. The site kept students occupied with pertinent work, allowing student to feel productive.
- _____ Good program. Student usually well occupied with pertinent work.
- _____ Adequately planned program. Student assigned pertinent tasks but work flow was somewhat slow.
- _____ Poorly planned program. Student was not assigned sufficient tasks to keep occupied. Student experienced a more than average amount of slack time.

3. Do you feel that the responsibilities you were given at this facility were adjusted to your ability to handle them?

- _____ The responsibilities given me were suited to my ability to handle them. They were appropriate for a newly graduated medical technologist entering the workforce.
- _____ Some of the responsibilities were above my ability to handle them. In my opinion, they were appropriate for a more experienced medical technologist.
- _____ I felt competent in handling all responsibilities given me. However, in general, the amount of responsibility given me was somewhat limited and therefore not appropriately adjusted to my abilities.
- _____ The responsibilities given me were not adjusted to my ability. The responsibilities were too limited and the amount of experience too narrow.

4. Do you feel the facility allowed flexibility for the individual student to gain maximum benefits?
- _____ The student program was quite flexible. Students were encouraged to pursue additional tasks or interests when routine or assigned work was completed.
- _____ The student program was somewhat flexible. If the student demonstrated a desire to pursue additional tasks or interest once assigned work was completed, the laboratory staff was helpful.
- _____ Due to the amount and nature of the work the student did not have the opportunity to pursue additional tasks.
- _____ A strict protocol was followed each day. Once assigned work was completed students were sent home.

II. Supervision and Instruction

Please rate the facility on each item below by circling the appropriate number on the rating scale.

The rating scale is:

0	1	2	3	4
not applicable	poor	adequate	above average	outstanding

- | | | | | | |
|------------------------------------------|----------|----------|----------|----------|----------|
| A. Apparent interest in student progress | 0 | 1 | 2 | 3 | 4 |
| B. Supervision of student | 0 | 1 | 2 | 3 | 4 |
| C. Fostering of student learning | 0 | 1 | 2 | 3 | 4 |
| D. Amount of feedback given student | 0 | 1 | 2 | 3 | 4 |
| E. Receptivity toward students' question | 0 | 1 | 2 | 3 | 4 |

III. Clinical Experience

1. List below the instruments and other major equipment you operated.

2. List the types of tests you observed but did not perform.

3. What additions and or deletions would you make to the program at this facility? Please explain.

IV. Academic/Clinical Correlation

1. Did you find correlation between previously learned theories and concepts and their practical application at this facility? If your answer is "no", please explain.
() yes () no

2. What specific recommendations would you make to more successfully correlate your learning experience within the University with the practical experience in this facility?

V. Student's Signature

Dates of Practicum

Date of Evaluation
