NorthShore
University HealthSystem

Department of Pathology & Laboratory Medicine

Medical Laboratory Science

Program Handbook

NorthShore University HealthSystem
Medical Laboratory Science Program

Table of Contents

Locations

With a history dating from 1891, Evanston Hospital is the nucleus of NorthShore University HealthSystem (NorthShore). Areas of clinical strength in this 420-bed hospital include cancer, cardiac and gastrointestinal services; neurology; psychiatry; orthopedics, and maternity services, including high-risk obstetrics. The hospital is also a licensed Level I Trauma Center. NorthShore University HealthSystem is an academic healthcare system comprised of seven entities. The system includes four hospitals-Evanston, Glenbrook, Skokie and Highland Park Hospitals (see below). As an integrated delivery system, the Corporation also includes NorthShore Medical Group, NorthShore Home Services and NorthShore Research Institute.

NorthShore, a member of Pritzker School of Medicine of the University of Chicago, provides a stimulating environment for teaching and learning exists in all departments. In addition to the Medical Laboratory Science Program, the hospital has training programs for radiology technologists, medical students, interns, residents and nurses.

You will be learning in a pleasant, relaxed suburban community, yet downtown Chicago is less than an hour away by car or public transportation. Once you've arrived on Lake Michigan's shores, you'll find Chicago is second to none in the variety of cultural events, educational opportunities and entertainment it has to offer.

Evanston Hospital
2650 Ridge Avenue
Evanston, IL 60201

Glenbrook Hospital
2100 Pfingston Road
Glenview, IL 60026

Highland Park Hospital
777 Park Avenue W
Highland Park, IL 60035

Skokie Hospital
9600 Gross Point Road
Skokie, IL 60076

Department of Pathology & Laboratory Medicine

NorthShore's laboratories are among the most progressive in the country and are accredited by the Joint Commission, College of American Pathologists and the AABB (formerly known as the American Association of Blood Banks). Specialized testing is performed for Evanston, Glenbrook, Highland Park, and Skokie Hospitals along with countless physician medical practices both within and outside NorthShore University HealthSystem.

Mission
In accordance with the goals set forth by the NorthShore University HealthSystem and the Department of Pathology and Laboratory Medicine (DPLM), it is the mission of the Medical Laboratory Science Program (MLS) to educate students to become qualified, responsible, healthcare professionals in clinical laboratory medicine.

Goals
In order to achieve this mission the following goals are set:

1. Provide education programs that prepare students in professional knowledge and entry level skills in the discipline of medical laboratory science.
2. Educate students in a manner to ensure quality laboratory results and thus quality patient care.
3. Recruit, retain and provide career counseling for appropriate numbers of students who have a high level of professional promise.
4. Review and address the needs of the healthcare community by providing graduates prepared to meet those needs.

Outcome Measures
NorthShore's MLS program continually achieves its mission and goals and this is reflected by the success of our outcome measures. Within the last 3 academic years, our program has a:

☑ **100% Graduation Rate**

☑ **100% Board of Certification Pass Rate**

☑ **100% Job Placement Rate**

Faculty
The high faculty to student ratio provides an excellent opportunity for learning. The Program remains an important part of the Department of Pathology and Laboratory Medicine. Each laboratory at all 4 hospitals is directed by a doctoral level clinical scientist or physician working full-time within his or her specialty. In addition, each major laboratory has a technical specialist or supervisor who delivers direct instruction and coordinates the involvement of other local experts. Students have ample opportunity for contact with the pathologists and technologists in the Department. This provides additional stimulus and opportunity to learn between classroom and laboratory assignments.

Section and Titles		Names	e-mail
MLS Program Faculty	Program Director & Blood Bank	Tyrie Gardner, MS, MT(ASCP)	tgardner@northshore.org
	Chemistry	Mary Granato, MT(ASCP)	mgranato@northshore.org
	Hematology	Natalya Trager, MT(ASCP)	nrekhtman@northshore.org
	Immunopathology	Mary Granato, MT(ASCP)	mgranato@northshore. org
	Microbiology	EmmyLou DeLa Cruz, M(ASCP)	edelacruz@northshore.org
	Molecular Diagnostic	Kristen Pesavento, MT(ASCP)	kpesavento@northshore.org
	Phlebotomy	Amber Davis	Adavis2@northshore.org

Curriculum

The MLS Program has been in existence at Evanston Hospital since 1940 and has recently expanded to include all of NorthShore's hospitals in the winter of 2018. The goal of the Program is to prepare competent men and women for the profession of Medical Laboratory Scientist. This goal is accomplished through the student's participation in a curriculum that includes a 6 week basic laboratory course followed by 10 months of clinical rotations with didactic instruction in each laboratory specialty.

Students are carefully guided through each basic laboratory course and each clinical rotation by experts in each laboratory specialty. The Teaching Coordinator also orients the student to the laboratory setting, schedules the student to work with a qualified Medical Laboratory Scientist in each area of the laboratory, conducts review sessions, administers quizzes and examinations and holds primary responsibility for student evaluation. Following are descriptions of each sequence and some of the clinical laboratories through which the student will rotate.

Basic Laboratory

The year begins with a student laboratory workshop period that takes place at Evanston Hospital. The basic laboratory courses present an ideal learning environment for the development of fundamental laboratory skills. This 6 week period includes lecture presentations, demonstrations, clinical observations and hands-on practical experience.

Clinical Rotations

Students rotate through clinical sections of the lab in a ***Core Laboratory*** and ***Non-Core Laboratory*** block format. These clinical rotations follow the basic laboratory courses and stress the applications of manual and automated laboratory skills, understanding the principals of test procedures, instrumentation, and quality control and approved safety practices. Students will be assigned to one of the 4-hospitals for ***Core Laboratory*** component of the clinical rotation. All of the ***Non-Core Laboratory*** clinical rotations will take place at Evanston Hospital during the remaining half of the academic year. Each rotation block is approximately 15 weeks long.

The ***Core Laboratory*** rotation includes: Blood Bank, Chemistry, Hematology, Coagulation, Urinalysis, and Point of Care testing. The ***Non-Core Laboratory*** rotation includes: Microbiology, Parasitology, Mycology, Immunology, Molecular Diagnostics, and Phlebotomy.

Didactic Lectures

The didactic portion of the Program is presented by pathologists, PhD scientists and experienced Medical Laboratory Scientists. It consists of approximately 6 hours of lecture per week with emphasis placed on theory, calculations and pathophysiology is considered the advanced application of theory taught.

Courses

Immunohematology/Transfusion Medicine

The student will learn the techniques of ABO blood grouping methods, Rh testing, crossmatching and identification of atypical antibodies. In addition, the student learns about the preparation and use of blood components and observes blood collection procedures including whole blood and apheresis donations, as well as hematopoietic progenitor cell collection. Blood bank activities require close coordination with the clinical care units, so students in this laboratory have a sense of direct involvement in patient care.

Clinical Chemistry

In almost every illness, changes occur in the chemical constituents of blood and other body fluids. Physicians rely on the Clinical Chemistry Laboratory to help in the diagnosis and treatment of diabetes, kidney disease, electrolyte imbalance and cardiac dysfunction through the analysis of patient samples. State-of-the art automation and robotics enable the laboratory to provide critical diagnostic information quickly and accurately to physicians in such areas as the emergency department, intensive care, surgery and the neonatal intensive care unit. In addition, the Clinical Chemistry Laboratory offers testing for the assessment of many metabolic systems that can include cholesterol measurement, thyroid and reproductive hormone levels, and therapeutic drug monitoring. Students will work with up-to-date, computer-assisted technology to provide critical as well as routine testing for effective patient care.

Hematology, Coagulation and Body Fluids

In the Hematology Laboratory students learn to count and classify the various types of red and white blood cells. They also learn how to determine whether the oxygen-carrying red blood cells are in a healthy state, an essential procedure for diagnosis of anemia. In addition, the students will be shown how to classify the cells in the bone marrow to assist the pathologist in the identification of leukemia and other blood disorders.

Tests are conducted in the Coagulation section of the Hematology Laboratory to determine the presence or absence of factors essential to normal blood coagulation. Special procedures are performed to identify acquired and inherited deficiencies of the

coagulation proteins.

In the Body Fluids section of this rotation, body fluids are examined to determine the kinds and numbers of body cells present. It is in this laboratory that both quantitative and qualitative testing of urine is done. Urinalysis involves testing for pH, color, specific gravity, sugars and excessive amounts of protein. Specimens are also examined for the presence of bacteria and parasites as well as crystals and casts formed by the kidneys.

Microbiology

The Microbiology Laboratory has the responsibility of isolating and identifying potentially pathogenic microorganisms. In many cases the laboratory also determines the susceptibility of the etiologic agent to a variety of antibiotics. This laboratory is divided into Bacteriology, Mycology, Mycobacteriology, Parasitology, and Virology.

Bacteriology is concerned with the various bacteria that may cause direct destruction of tissue or harmful sequelae. Throat, urine, stool, blood, wound and sputum cultures are some of the types of specimens received for processing.

Mycology deals with fungi that may infect man on the surface of the skin (i.e., ringworm) or cause systemic complications (i.e., histoplasmosis). Mycobacteriology is the study of such organisms as that which causes tuberculosis.

In Parasitology specimens are examined for the presence of amoebae, malarial organisms, worms and their ova, and flagellates. Larger parasites, such as mites, fleas or ticks are also identified so the appropriate disease diagnosis can be made, treatment started, and public health concerns addressed.

The Virology Laboratory isolates viruses such as influenza, chicken pox, cytomegalovirus, and herpes from clinical specimens. Students will learn to perform methods and procedures used to isolate and identify these and other viruses.

Immunopathology

The Immunopathology Laboratory performs state-of-the art testing in Flow Cytometry and Diagnostic Immunology. In Flow Cytometry special emphasis is placed on diagnosis of leukemias and lymphomas and monitoring of immunologic pathologies. Rotation through the Immunology section includes performance of protein chemistry and infectious disease serology; detection of tumor markers; and pregnancy and prenatal diagnosis.

Molecular Diagnostics

The Molecular Diagnostics Laboratory is the fastest growing laboratory in our institution, reflecting the explosion in knowledge about the human genome and the availability of new tools to examine DNA and RNA. Highly sensitive nucleic acid amplification methods, including real- time PCR, are used to detect low concentrations of infectious agents such as *Herpes simplex* virus. Quantitative (viral load) tests for hepatitis C and HIV nucleic

acid are used to monitor response to therapy. Analysis of mutated genes is performed to evaluate patients with clotting disorders, and clonal gene rearrangement studies are used in the diagnosis of lymphomas.

Phlebotomy

Lectures and clinical rotation demonstrating the proper collection and processing of blood for routine and special tests are given. Both venipuncture and dermal puncture techniques are presented. Medical Laboratory Science students will gain competence drawing blood for laboratory testing in the Outpatient Laboratory and hospital patient care units.

Laboratory Operations, Education, and Management

Group dynamics, basic educational theory, the five functions of management and a variety of related topics are presented through lecture and group activities.

Scholastic Bowl: The Program participates in the annual Medical Laboratory Science Student Bowl sponsored by the American Society for Clinical Laboratory Science at the state-wide meeting. Students are also given the opportunity to attend scientific education sessions at this meeting.

Mock Certification Exam: The Program administers a non-credit comprehensive examination based on the format of the American Society for Clinical Pathology certification examination.

Admission & Qualification

The program has 2 starting sequences: late summer (August) and winter (January). Each cohort has a maximum capacity of 8 students. All 8 students who begin the program in the late summer will have both their Core and Non-Core clinical training at Evanston Hospital in Evanston, Illinois. Those who begin their training in the winter will be considered for assignment at any of our 4 hospitals for the Core clinical training. The Non-Core clinical training will be at Evanston Hospital.

The deadline for receipt of applications is November 30 for both program starts; applications received after this date will be considered as time and space allows.

Minimum criteria for consideration of admission to the NorthShore MLS Program include:

Academic Credit

Since this is a hospital based certification program we do not confer academic credit for courses taken here. **Applicants must have a bachelor's degree or equivalent before being accepted into our program. Alternately, students from affiliated universities may spend their final year in our program completing their coursework and obtaining clinical experience.** Requirements for both routes are as follows:

- Students from Affiliated Universities: Completion of all pre-requisite medical laboratory science courses required by the university that will render a student eligible for a baccalaureate degree at the completion of the clinical program. Total credits earned in the program are equivalent to 32 semester hours.

- Post-baccalaureate Students: The baccalaureate degree should include the following.
  1. 16 semester hours (24 quarter hours) of biological science (with one semester in microbiology)
  2. 16 semester hours (24 quarter hours) of chemistry (with one semester in organic or biochemistry)
  3. 1 semester (one quarter) of mathematics

Grade Point Average

A cumulative grade point average of greater than 2.8 (4 point system) with a cumulative 2.8 in biology and chemistry courses taken is required.

Essential function

Essential functions represent the non-academic ability of the applicant or student to accomplish the essential requirements of the MLS Program. These standards are based on the essential skills of the medical laboratory science student. They must be mastered in order to obtain credit for the educational program.

Vision	The student must be able to identify sizes and shapes and discriminate colors or shades both macroscopically and microscopically.
Communication	The student must be able to communicate fluently in English by written and oral and/or alternate means. This includes the ability to successfully receive and transmit information. The student must also be able to read and follow instructions.
Movement	The student must have the ability to freely maneuver around the assigned laboratory work areas and patient care settings.
Motor Skills	The student must be able to safely and accurately perform diagnostic laboratory procedures. This includes, but is not limited to, lifting, operating instruments, performing manual tests, and performing phlebotomy.
Emotional Stability	The student must be able to accurately perform laboratory duties in a stressful environment. This includes, but is not limited to, identifying and responding to emergency and on-routine situations.

Application Process

When an application is received, it is processed using the following procedure:

1. The application is held until transcripts from all universities attended and two reference letters are received. If the applicant is an international graduate, the external transcript evaluation must also be a part of the student's file and must come directly from the external agency.
2. If the grade point average meets minimum requirements, the student is contacted to set up an interview.
3. An interview with the applicant is scheduled and conducted by the Program faculty.
4. Utilizing the stated criteria, the class is selected and clinical assignments along with start dates are made by the Admissions Committee.

Academic Affiliations

Elmhurst College	**Purdue University**	**Roosevelt University**
Erica Ashauer	Lisa Hilliard	Kelly Wentz-Hunter
Associate Director	Director	Allied Health Advisor
190 Prospect Avenue	550 Stadium Mall Drive	435 S. Wabash, WB 914J
Elmhurst, IL 60126-3296	West Lafayette, IN 47907	Chicago, IL 60605
(630) 617-6482	(765) 494-8102	(312) 322-7107
ashauere@elmhurst.edu	lhilliar@purdue.edu	kwentzhunter@roosevelt.edu

Tuition

Tuition is $8,000 for the clinical experience *(university 3+1 candidates see below).* Tuition is payable in 4 equal quarterly installments of $2,000 each starting on the first day of class.

University Affiliates

The student will pay the fee designated by the university to the university. From the amount paid to the university, the university will remit 75% of the general service fees to NorthShore for the clinical internship term. If the amount remitted by the university is less than $8,000, the student is responsible for paying the difference directly to NorthShore. This difference may be distributed as listed above.

If a student is dismissed or voluntarily withdraws before the 15th of the month in which tuition is due, the tuition reimbursement for that period will be prorated.

Financial Assistance

With the exception university affiliate candidates, there is no financial assistance that is available for this program. All tuition and fees must be paid by personal check or credit card. Federal student loan funding is not available for this program either. Individuals who seek assistance must utilize other resources such as personal loans to help satisfy tuition payments. Three +1 candidates may apply for financial aid in the usual fashion through the university.

Fees and Other Costs

The following fees will apply.

Application Fee	$25
Acceptance Fee	$200 (due prior to start of class, applied to tuition)
Books	$400 (approximately)
Liability Insurance	$32 (approximately)
Certification Exam Application	$230

Health Program

Students must submit proof of immunity to measles, mumps, rubella and varicella (chicken pox) and be screened 2 times within the last 12 months for TB. A Hepatitis B vaccine series is recommended but not required.

Insurance

Proof of health insurance and professional liability coverage must be received before the first day of the clinical education. The hospital will provide emergency service for a student; charges incurred will be the responsibility of the student.

Selection Criteria

Admission to the medical laboratory science program is made without discrimination because of race, color, gender, religion, disability, and national or ethnic origin.

Once admission eligibility has been established, students are selected using the following criteria:

1. cumulative and science grade point averages
2. reference letters from biology, chemistry and laboratory instructors or employment managers or supervisors.
3. evaluation of the personal interview

Candidates will be randomly assigned to any one of NorthShore's hospitals for the ***Core*** Laboratory clinical rotation. Typically, 2 students are assigned at each hospital site for the winter academic year. All students enrolled will received the ***Non-Core*** clinical training at Evanston Hospital located in Evanston, Illinois during the final half of their training.

Exception: 3+1 candidates who apply prior to the deadline will be considered for the late summer start to satisfy baccalaureate requirements. These candidates will be offered priority for this academic sequence only if all criteria are met by the candidate.

Dismissal

Academic

Students must maintain a minimum 70% average on all examinations and performance evaluations to successfully complete the program. The grading system is:

100%	-	90%	=	A
89%	-	80%	=	B
79%	-	70%	=	C
	<70%		=	No Credit

Grades will not be curved. If necessary, the students will be given the opportunity to improve a failing grade only once per subject area. Inability to maintain a 70% average will result in academic probation. When a student is on probation, she/he will be given a limit in which to improve the average; this limit will be measured either by time or by a specific number of future examinations. Failure to obtain a 70% average at the end of this limit will result in dismissal from the program.

Psychomotor

Regardless of academic status, students who possess unsatisfactory psychomotor skills will be placed on probation. Opportunity will be given to improve this rating. If the probation is not removed, the student will be dismissed.

Affective

Based on the Program's ethical code, the student will be dismissed from the program if one or more of the following occurs:

1. betrayal of patient's confidential information
2. discussion of another student's academic progress
3. practice of academic dishonesty
4. refusal to follow a supervisor's directions
5. violation of the hospital's or program's policies
6. violation of customer service standards

The list of reasons for dismissal does not presume to be all inclusive. Evaluations in each laboratory section are made by all the technologists who taught the student.

Appeal Process

A student may use the appeal process for disagreement with any evaluation or dismissal decision. The Appeal Committee is composed of the Medical and Program Directors, affected Teaching Supervisor, one student advocate selected by the individual appealing, a Senior Administrator and a member of the Senior Attending Staff. Details may be found in the Student Policy Manual.

Graduation and Certification

Students completing the clinical education earn a baccalaureate degree from affiliated universities, if applicable, and a certificate from Evanston Hospital. Awarding of the degree is not contingent on passing a national certification examination. Grades are accepted for credit by the degree-granting institution if applicable.

Graduates are eligible to take the national certification examination for Medical Laboratory Science, administered by the American Society for Clinical Pathology Board of Certification. Our program experiences a 100% pass rate with greater than 95% of examinees passing the first time and 100% passing with one retake. In addition, our graduates typically score well above the national average.

Policies

All student enrolled in the program will receive a copy of the current policy manual. Policies may be given to applicants upon request.

For more information, contact us:

Program Officials

Tyrie Gardner, MS, MT(ASCP)
Program Director

Jason Kang, MD
Medical Director

Correspondence

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Accreditation

The program is accredited by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS). Interested parties may contact NAACLS at:

National Accrediting Agency for Clinical Laboratory Sciences
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Rosemont, IL 60018
(773) 714 8880
info@naacls.org
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