The Department of Pathology at Duke University offers a wide array of training programs to fit individual requirements and goals.

The Residency Training program is an ACGME approved program and is available as an Anatomic Pathology/Clinical Pathology combined program, a shorter Anatomic Pathology only program, or an Anatomic Pathology/Neuropathology program. Subspecialty fellowships in Cytopathology, Dermatopathology, Hematopathology, Medical Microbiology, and Neuropathology are also ACGME approved. These programs provide the highest quality of graduate medical education by drawing on the depth and breadth of faculty expertise in the Department in all aspects of anatomic and clinical pathology and the availability of a wide variety of often complex clinical cases seen at Duke University Health System.

For medical students interested in a career in Pathology predoctoral fellowships, internships and externships are available.

Research Training in Experimental pathology can be obtained through Pre- and postdoctoral fellowships of one to five years. All predoctoral fellows are candidates for the Ph.D. degree in pathology. The Ph.D. is optional in postdoctoral programs, which provide didactic and research training in various aspects of modern experimental pathology.

A two year NAACLS accredited Pathologists’ Assistant Program leads to a Master of Health Science degree, certifies graduates to sit for the ASCP Board of Certification examination, and leads to exciting career opportunities in a variety of anatomic pathology laboratory settings. Pathologists’ assistants are analogous to physician assistants, but with highly specialized training in autopsy and surgical pathology. This profession was pioneered in the Duke Department of Pathology 50 years ago, and is one of only 13 such programs in existence today.
Pathologists’ Assistant Program

This professional program consists of two calendar years of training. There are three semesters during the academic year, including summer practical rotations. During the first year, Fall and Spring academic semesters include medical school level courses in cell and molecular biology, biochemistry, genetics, gross and microscopic human anatomy, human physiology, embryology, microbiology, immunology, pharmacology and pathology. A January Intersession during the first year introduces students to practical surgical and autopsy pathology techniques, medical terminology, and educational methodology. During the summer semester of the first year and throughout the second year, students develop and hone their skills in surgical and autopsy pathology techniques during practical clinical rotations, as well as gaining exposure to laboratory operations and management, educational methodologies, histologic and molecular pathology techniques, and photography.

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Definition of a Pathologists’ Assistant

A Pathologists’ Assistant is a highly trained, certified allied healthcare professional who is qualified by academic and practical training to provide various services in anatomic pathology under the direction and supervision of a licensed, Board Certified or Board Eligible Anatomic Pathologist. Pathologists’ Assistants are academically and practically trained to provide accurate and timely processing of a variety of laboratory specimens, including comprehensive macroscopic examination and evaluation of all surgical pathological specimens. Pathologists’ Assistants also perform postmortem examinations including prosection, assisting the Pathologist with rendering the provisional anatomic diagnosis, composing the clinical history, recording the macroscopic anatomic findings, and submitting tissue sections for microscopic examination. Pathologists’ Assistants play a critical role in the delivery of healthcare services in both surgical pathology and autopsy pathology. They are key partners in assisting the Pathologist to arrive at a pathologic diagnosis, but it is the sole responsibility of the Pathologist to render a diagnosis.

Pathologists’ Assistants often are responsible for the organization and efficient and effective operation of the surgical pathology suite and the anatomic pathology service. This may comprise personnel management including supervising accessioners, lab aides, grossing technicians, and transcriptionists in
the surgical pathology suite and autopsy technicians/morgue assistants in the autopsy room; writing and reviewing surgical pathology and autopsy procedures; inventory control; laboratory operations such as quality assurance, quality control, accreditation inspection preparation, and budgeting; and in the academic setting, supervision of learners (e.g., pathologists’ assistant students, medical students, post-sophomore fellows, and residents) and providing shadowing experiences to prospective Pathologists’ Assistants, and college or high school students interested in healthcare.

Pathologists’ assistants perform in a wide scope of clinical practices. Although the majority of pathologists’ assistants work in academic and community hospitals, PAs can also be employed in other areas such as private pathology laboratories, forensic pathology laboratories and morgues, reference laboratories, government healthcare systems, and medical teaching facilities. Some PAs are even self-employed business owners providing their pathology expertise via long- and short-term contract.

Pathologists' assistants contribute to the overall efficiency of the laboratory or pathology practice in a cost effective manner. With increased pressure on healthcare systems to control costs, the demand for qualified pathologists' assistant is growing every year.

Scope of Practice for Pathologists’ Assistants

Pathologists’ assistants are qualified by academic and practical training to provide, under the direction and supervision of a licensed, Board certified, or Board eligible pathologist, the following services (from the AAPA website https://www.pathassist.org/page/What_is_a_PA):

1. Surgical Pathology:

Preanalytical Tasks

- Assure proper specimen collection and submission prior to accessioning.
- Assist clinicians with specimen collection questions, triage of limited samples, and esoteric testing.
- Assure appropriate specimen accessioning and/or verification of unique patient identifiers.
- Assure proper specimen handling and fixation prior to processing.
- Obtain and review pertinent clinical information and history, including imaging studies, laboratory results, and operative records.
- Discuss cases and history with surgeons, clinicians, and pathologists.

Macroscopic Description and Dissection

- Perform the macroscopic description and dissection of all surgical specimens ranging from simple to complex cases including pertinent macroscopic information for the staging of complex cancer cases.

Tissue Sampling

- Prepare and submit tissue sections for light microscopy.
- Obtain samples for ancillary studies including, but not limited to:
  - Tumor triage
  - Lymphoma protocol
Perform Surgical Pathology Special Procedures including, but not limited to:

- Decalcification
- Frozen section (tissue selection, dissection, embedding, mounting, cutting/staining, cover-slipping)
- Intraoperative consultation for evaluation of macroscopic specimen adequacy and margins
- Muscle biopsy preparation
- Assessment of renal biopsy specimens for adequacy by evaluation of the presence of glomeruli
- Nerve biopsy orientation and preparation
- Heart and other transplant biopsy preparation
- Bone marrow aspirate and biopsy preparation
- Touch preparations/imprints/squash preparations
- Tumor mapping
- Bone saw operation

Imaging

- Specimen photomacrography
- Photomicrography
- Specimen radiography
- Slide scanning

Postanalytical Tasks

- Review of macroscopic description transcription.
- Microscopic triage of surgical pathology cases for quality control and quality assurance purposes.
- Coding
  - Verify the accuracy and editing of CPT codes.
  - Assign, review, and edit SNOMED codes.
- Store and properly dispose of specimens.
- Assist in the organization and coordination of surgical pathology conferences.
- Assure proper maintenance of equipment and provision of adequate supplies.

2. **Autopsy Pathology:**

Prosection of adult, neonatal/perinatal, pediatric, forensic, or infectious autopsies

Preanalytical Tasks
• Assure proper autopsy authorization, permission, and release of body documents.
• Review the patient’s medical record including imaging studies and laboratory results, etc.
• Discuss with the attending pathologist(s) to identify any special techniques and procedures to be utilized in the completion of the postmortem examination (e.g., tissue for microbial cultivation, histochemistry, molecular analysis, microarray, PCR analysis, immunofluorescence, toxicological, viral, or electron microscopic studies, etc.), and notify all personnel directly involved.
• Notify decedent’s physician, the funeral home, and all other appropriate authorities prior to the commencement of the autopsy; and coordinate any requests for special specimen sampling (e.g., organ and tissue procurement for transplantation, research, etc.).

Autopsy Performance

• Perform postmortem examinations including:
  o External examination
  o In situ organ inspection
  o Evisceration
  o Dissection and dictation or recording of data including organ weights, measurements, presence and quantitation of body fluids, and macroscopic anatomic findings

Tissue Sampling

• Select, prepare, and submit appropriate and ample tissue samples for the following:
  o Frozen section
  o Permanent section
  o Immunofluorescence
  o Electron microscopy
  o Microbial cultivation
  o Tissue banking or research
  o Cytogenetic analysis
  o Toxicology
  o Decalcification
  o Microarray
  o Metabolic studies

Autopsy Special Procedures

• Perform Autopsy special procedures including:
  o Obtaining blood/body fluids for clinical pathologic testing
  o Cut and stain frozen sections
  o Bone marrow sampling
  o Spinal cord removal
  o Long bone removal
  o Coronary artery perfusion
  o Central nervous system perfusion
  o Corneal removal and/or orbital enucleation
  o Temporal bone removal
  o Sample collection for research

Imaging

• Photomacrography of the body, internal organs, lesions, and other pertinent findings and external or internal identification markings
• Photomicrography
• Image analysis
• Radiography

Preparation of Reports

• Clinical history
• Assist with preparation of the provisional anatomic diagnosis (PAD)
• Macroscopic (gross) description
• Assist with preparation of the final summary/clinical pathologic correlation

Postanalytical Tasks

• Reconstruct and prepare the body for release and maintain HIPAA criteria for the release of the body to the appropriate mortuary or funeral home representative.
• Assure accurate completion of a microscopic section log.
• Perform duties related to completion and finalization of the autopsy procedure and report including administrative maintenance of anatomic pathology protocols; photomacrography and photomicrography images; assignment, review, and editing of SNOMED codes; and compliance with laboratory accreditation criteria.
• Assist in the organization and coordination of anatomic pathology conferences.
• Assure proper maintenance of equipment and provision of adequate supplies.

3. Laboratory Operations

Regulatory

• Prepare for laboratory accreditation inspection.
• Write, maintain, and update policy and procedure manuals.
• Monitor compliance with regulatory agencies (e.g., The Joint Commission, College of American Pathologists [CAP], state and local accrediting agencies).

Quality Improvement

• Prepare and maintain quality assurance monitors (e.g., frozen section/permanent section concordance/discordance, turn-around-time reports).
• Participate in quality assurance/process improvement activities.
• Participate in general problem solving and troubleshooting in pathology technical issues.
• Review of microscopic slides for section adequacy (not diagnostic interpretation).

Safety

• Apply laboratory safety governmental regulations and standards as practical to anatomic pathology.
  o Monitor compliance with safety regulatory agencies (e.g., OSHA).
• Participate in safety training (e.g., chemical hygiene, infection control), avoid biological hazards, and practice proper use of personal protective equipment.
• Maintain the cleanliness of the surgical and autopsy pathology suites, gross station, and instruments with daily disinfection.

Management Activities
• Perform laboratory administration activities including surgical pathology workflow and scheduling.
  o Record and evaluate workflow and personnel metrics.
• Prepare laboratory budgets and purchase equipment.
  o Order supplies/perform inventory control.
• Perform personnel management activities including hiring, disciplinary action, job description creation, supervision, and performance evaluations.
• Attend and prepare for conferences (e.g., tumor board, grand rounds, journal club, and morbidity and mortality conferences).
• Develop, implement, and evaluate a competency testing program encompassing ACGME guidelines where appropriate.
• Provide guidance in new laboratory design and construction.

Education

• Educate and train pathology residents, new employees, students, and technical staff.
• Participate in the development of a didactic curriculum for educational processes.
• Perform formal evaluation of residents, pathologists’ assistant students, and medical students.
• Educate nursing and hospital staff on best practices in pathology including proper specimen collection procedures and triage.
• Present at academic conferences.
• Community outreach educating colleagues and the public about laboratory medicine.
• Participate in professional organizations.

Laboratory Information Systems

• Responsibilities may involve analysis, design and implementation including:
  o Data gathering and analysis of methods and procedures
  o Design recommendations in the form of user proposals
  o Operational instructions
  o Computer program specifications
  o Implementation and support involving systems testing
  o User training

Research

• Develop Institutional Review Board (IRB) proposals.
• Coordinate tissue banking activities (e.g., obtain consents, appropriate tissue collection, tissue storage, release of tissues, review of protocols).

Ancillary duties (may include):

• Maintain equipment (e.g., calibration, performance checks, identification of malfunctions).
• Assess new technology for possible implementation.
• Validate new tests or instruments.
• Quality control (e.g., stain check, temperature check).
• Comply with regulatory requirements for specimen storage and disposal.
• Service on institutional committees.
• Participate in faculty recruitment.
History of the Pathologists’ Assistant Profession

In 1965, Dr. Eugene Stead at Duke University Medical Center pioneered the concept of physician extenders when he established the nation’s first physician assistant program. This allied health profession differed significantly from all other allied health professions because rather than being another support profession working independently on tasks not considered to be the practice of medicine, these individuals were trained to perform tasks previously performed exclusively by physicians. Dr. Thomas Kinney, Chair of Pathology at Duke University Medical Center, saw a need for similar professionals in anatomic pathology so he initiated the nation's first pathologists' assistant program in 1969. These professionals were trained to perform tasks, under a pathologist's supervision, in autopsy and surgical pathology that had previously been performed by pathologists. Since that time, other programs have been established and the profession has grown in number and stature. The training programs have grown from certificate programs to bachelor's degree programs and currently, all of the programs are graduate level offering Master's degrees.

At its inception, the physician assistant profession was mentored and structured by the American Medical Association and accreditation of training programs and certification of individuals were established. Because of the small number of pathologists' assistants, high degree of specialization, and uneven initial acceptance of the profession by national pathology organizations, no guiding physician or pathology organization would establish criteria for training programs and credentials for individuals. This task was assumed by the national professional organization of pathologists' assistants, The American Association of Pathologists’ Assistants (AAPA), which was founded and incorporated as a not-for-profit organization under the statutes of Ohio in 1972. The objectives of the organization were to:

- Benefit and further the profession by promoting and maintaining high standards of ethical conduct.
- Provide continuing medical education for its members and work for the development of additional Pathologists' Assistant training programs.
- Inform the public and medical profession as to the goals and professional capabilities of the Pathologists' Assistant.
- Implement new programs that will help maintain the status of the AAPA and its members as a vital link in the health care chain.

The AAPA held its first meeting in Atlanta in 1975. The first goals set by the organization were guidelines for training programs, a mechanism for approval of training programs, and the development of an examination for fellow status of membership in the AAPA. Graduates from AAPA approved programs or persons with a bachelor's degree and three years of AAPA approved on-the-job-training were eligible to sit for the examination. The major long-term goal of the AAPA was to achieve professional recognition for pathologists' assistants through establishing both independent accreditation of training programs and national certification of individual practitioners. The program approval and membership examination of the AAPA served as de facto accreditation and certification by many employers for over 25 years.

In 1995, the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS), following negotiations with the AAPA, agreed to accredit training programs. Over the following two years, all of the former AAPA approved programs became accredited. Subsequently, all of the initially accredited
programs have been through several rounds of evaluation by NAACLS. All programs have been re-accredited.

In 2000, the National Commission for the Certification of Pathologists’ Assistants was formed and held its first meeting in Toronto in conjunction with the annual AAPA meeting. The Commission was comprised of representatives from most major stakeholders in the practice of pathology. The Commission was charged with assuring the development and implementation of a national certification process for Pathologists' Assistants. The Commission partnered with the American Society for Clinical Pathology and the first national certification was held in Boston in September 2005 in conjunction with the annual AAPA meeting. Certification is now available only to graduates of NAACLS accredited Pathologists’ Assistant Programs, no longer to on-the-job-trained individuals, and the board of certification examination is offered through the ASCP as Computer Adaptive Testing at multiple Pearson Professional Centers throughout the United States. Every three years, a certified PA must demonstrate sufficient CME to maintain ASCP certification.

Today, the American Association of Pathologists' Assistants (AAPA) is dedicated to the advocacy and advancement of the pathologists’ assistant profession. The AAPA advocates, promotes and sustains the highest education and professional standards for the profession, for all associated educational training programs and for individual pathologists’ assistants. The mission to provide its members with high quality targeted continuing medical education (CME) opportunities, as well as professional development and leadership activities to include networking and support. Additionally, the AAPA strives to promote and support high quality standards within the scope of practice for pathologists' assistants in anatomic pathology, ensuring the provision of high quality patient care.

GOAL and MISSION STATEMENT of the Duke School of Medicine Pathologists’ Assistant Training Program

The Duke University School of Medicine Pathologists’ Assistant Training Program goal and mission are to train academically qualified individuals to become allied health professionals who provide surgical pathology and autopsy pathology services under the direct supervision of a board certified pathologist.

Upon graduation from the Duke PA Program, graduates will be able to:

1) Demonstrate and apply general knowledge and theory of pathologic disease processes, as they relate to gross and microscopic anatomy, anatomic pathology techniques and laboratory procedural skills, gross and microscopic photography, and the analysis of medical and laboratory data associated with surgical and autopsy pathology;

2) Demonstrate and apply, under the direction of a pathologist, the technical skills to perform surgical pathology and autopsy pathology gross examination and prosection of specimens, and the knowledge and judgment to identify and select the appropriate tissues and special studies reflective of the clinical history and general medical information available;

3) Demonstrate and apply the knowledge and skills to perform a variety of administrative functions in anatomic pathology, to include budgetary, supervisory, teaching, the selection, use and maintenance of equipment, proactive communication, problem resolution, and interprofessional collaboration as well as other duties that may be assigned.
Program Accreditation

In addition to the accreditation of Duke University, and the School of Medicine, the Pathologists’ Assistant Program is individually accredited by the National Accrediting Agency for Clinical Laboratory Science (NAACLS) which is recognized by the United States Department of Education. For further accreditation information, contact:
National Accrediting Agency for Clinical Laboratory Science
5600 N. River Road
Suite 720
Rosemont, IL  60018-5119
773.714.8880 (Telephone)
773.714.8886 (FAX)
info@naacls.org
http://www.naacls.org

Employment and Salary Opportunities for Graduates

The opportunities for employment and salaries have been excellent. There are very few accredited pathologists' assistant training programs (13 plus several additional applicants for accreditation) and thus the supply of graduates is limited. At Duke, most graduates have found employment before completing the training program and average starting salaries currently begin at the mid $80,000 range.

Core Faculty

Jiaoti Huang, M.D., Ph.D., Professor and Chair of Pathology, Genitourinary Pathology
Rex Bentley, M.D., Professor, Program Director, Chief of Surgical Pathology, General Surgical, Gynecologic and Breast Pathology
Diana Cardona, M.D., Associate Professor, Director of Surgical Pathology Laboratory, Medical Director Pathologists’ Assistant Program, Gastrointestinal and Orthopedic Pathology
Pamela B. Vollmer, B.H.S., PA(ASCP), Associate Program Director and Educational Coordinator, Director of Admissions, Staff Pathologists’ Assistant
Ayumi Deeny, M.H.S., PA(ASCP), Staff Pathologists’ Assistant, Rotation Coordinator in Surgical Pathology
Nicholas Tofolo, M.H.S., PA(ASCP), Staff Pathologists’ Assistant and Instructor in Surgical Pathology
Allison Topper, M.H.S., PA(ASCP), Staff Pathologists’ Assistant and Instructor in Surgical Pathology
Meridith Hennessey, M.H.S., PA(ASCP), Staff Pathologists’ Assistant and Rotation Coordinator in Autopsy Pathology
Windy Riley, M.H.S., PA(ASCP), Staff Pathologists’ Assistant and Instructor in Autopsy Pathology
Fern Szulgit, M.H.S., PA(ASCP), Staff Pathologists’ Assistant, Durham Regional Rotation Coordinator in Surgical Pathology
Nikolay Wolff, M.H.S., PA(ASCP), Staff Pathologists’ Assistant and Instructor in Surgical Pathology, Durham Regional Hospital
Alexis Sharp, M.H.S., PA(ASCP), CCRP, MBA, Senior Clinical Research Coordinator with the Heart Center Clinical Research Unit, Primary and Acute Cardiology
Edward Bossen, M. D., Professor Emeritus, General Surgical Pathology
William Bradford, M.D., Professor Emeritus, Pediatric and Neonatal Pathology
Laura Barisoni, MD, Professor, Surgical and Renal Pathology
Thomas Cummings, M.D., Professor, General Surgical Pathology, Ophthalmic Pathology, Neuropathology, Pathology Residency Program Director
Rajesh Dash, M.D., Professor, Cytology and General Surgical Pathology
Cynthia Guy, M.D., Professor, Cytology and Gastrointestinal and Liver Pathology
Laura Hale, M.D., Ph.D., Professor, Pathology, Autopsy Pathology
David Howell, M.D., Ph.D., Professor, Immunopathology, Renal Pathology, Senior Vice Chair of Pathology
Anand Lagoo, M.D., Professor, Hematopathology
Thomas McIntosh, Ph.D., Professor, Research Scientist, Cell Biology
Sara Miller, Ph.D., Professor, Electron Microscopy
Alan D. Proia, M.D., Ph.D., Professor, Ophthalmic Pathology
Victor Roggli, M.D., Professor, Pulmonary Pathology
Maria A. Selim, M.D., Professor, Dermatopathology
John Shelburne, M.D., Ph.D., Professor, Pathology Education, Ultrastructural Pathology
Sarah Bean, M.D., Associate Professor, General Surgical Pathology and Cytopathology
Michael Datto, M.D., Ph.D., Associate Professor, Molecular Pathology
Andrea Deyrup, M.D., Ph.D., Associate Professor, Pathology Course Director for Body and Disease
Xiaoyin “Sara” Jiang, M.D., Associate Professor, Head and Neck Pathology, Cytopathology
Claudia Jones, M.D., Associate Professor, Director of Cytology
John Madden M.D., Ph.D., Associate Professor, General Surgical Pathology and Urologic Pathology
Shannon McCall, M.D., Associate Professor, Gastrointestinal and Liver Pathology
Thomas Sporn, M.D., Associate Professor, Forensic Pathology, Pulmonary Pathology
Robin Vollmer, M.D., Associate Professor and Director of Surgical Pathology at the Durham Veterans Affairs Hospital, General Surgical Pathology, Cytopathology, and Dermatopathology
Christopher Alley, M.D., Assistant Professor, General Surgical Pathology and Cytopathology, Durham Veterans Affairs Hospital
Rami Al-Rohil, MBBS, Assistant Professor, Surgical Pathology and Dermatopathology
Maureen Bauer, M.D., Assistant Professor, Surgical Pathology, Duke Regional Hospital Laboratory Medical Director & Pathology Department Chair
Anne Buckley, M.D., Ph.D., Assistant Professor, Neuropathology
Elizabeth Boswell, M.D., Assistant Professor, Surgical Pathology, Chief, Pathology and Laboratory Medicine Services, Durham Veterans Affairs Hospital
Jennifer Carbrey, Ph.D., Assistant Research Professor, Cell Biology
John Carney, M.D., Assistant Professor, Surgical, Pulmonary and Autopsy Pathology
Edgardo Parilla Castellar, M.D., Assistant Professor, Breast and Molecular Pathology
Lani Clinton, M.D., Ph.D., Assistant Professor, Gastrointestinal Pathology
Louis DiBernardo, M.D., Assistant Professor, Cardiovascular and Autopsy Pathology
Kenneth Ellington, M.D., Assistant Professor, Dermatopathology
Lynn Ferguson, M.D., Assistant Professor, General Surgical Pathology
Wen-Chi Foo, M.D., Assistant Professor, Surgical Pathology
Carolyn Glass, M.D., Assistant Professor, Cardiothoracic and Autopsy Pathology, Autopsy Service Director
Allison Hall, M.D., Assistant Professor, Surgical Pathology
Amy Lark, M.D., Assistant Professor, General Surgical Pathology and Cytopathology, Durham Veterans Affairs Hospital, VA Surgical Pathology Rotation Coordinator
Giselle Lopez, M.D., Ph.D., Assistant Professor, Neuropathology
Chad McCall, M.D., Ph.D., Assistant Professor, Hematopathology
Jadee Neff, M.D., Ph.D., Assistant Professor, Hematopathology and Molecular Pathology
Elizabeth Pavlisko, M.D., Assistant Professor, Pulmonary, Cardiovascular and Autopsy Pathology
Avani Pendse, M.D., PhD Cytopathology, Genitourinary, and Gastrointestinal Pathology
Danielle Range, M.D., Assistant Professor, Head and Neck Pathology
Program of Study

The program is 23.5 months long, beginning with the start of the medical school academic year in August of each year (see current Duke Medical School Bulletin for exact dates). Students take most of their first year basic science courses in the School of Medicine with medical students. The first year provides a broad, graduate level background in cell and molecular biology, biochemistry, genetics, gross and microscopic human anatomy, human physiology, microbiology, embryology, immunology and pathology. In the second year, students train in small group and one-on-one experiences with Pathology Department faculty and staff, and participate in external rotations.

Curriculum

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<th>Year 1 Fall</th>
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<tr>
<td>PATHASST 100 Human Structure and Function 1</td>
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<tr>
<td>PATHASST 102 Body and Disease</td>
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<td>PATHASST 204 Intro to Practical Anatomic Pathology Techniques</td>
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<td>PATHASST 210 Introduction to Autopsy Pathology</td>
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<td>PATHASST 215 Histology Techniques</td>
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<td>PATHASST 221 Introduction to Surgical Pathology-Duke</td>
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<td>PATHASST 322 Surgical Pathology I-DVAMC Site</td>
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<td>PATHASST 340 Photography I</td>
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PATHASST 323 Autopsy Pathology I 4
PATHASST 361 Pathologic Basis of Clinical Medicine I 3
PATHASST 359 Laboratory Technologies and Management 2

Year 2 Spring

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<td>PATHASST 341 Photography II</td>
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<td>PATHASST 390 Senior Seminar</td>
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ACADEMIC DEGREE AND CERTIFICATE AWARDED 94

Course Descriptions

PATHASST-100, 101. Human Structure and Function 1 and 2. This core preclinical course focuses on the scientific principles underlying the structure and function of the human body, thereby providing the foundational knowledge for the practice of medicine and facilitating the incorporation of the new scientific knowledge throughout the medical career. The course content includes: biochemistry, cell biology, genetics, histology, anatomy, physiology, and the neurosciences. Topics pertaining to human disease and injury are incorporated into the curriculum to promote application of course material. Core material is presented through team-based learning, didactic lectures, laboratory exercises, clinical case based problem-solving, and clinical correlations with patients. Credit: 6, 12. Carbrey

PATHASST-102. Body and Disease. This core course in human disease is presented from February through June of the first year. The course begins with fundamental principles of the four basic sciences most directly related to human disease: immunology, microbiology, pathology, and pharmacology. This segment comprises the first seven weeks and also includes discussion of disease classes not related specifically to any one organ system, including cancer, immunodeficiency diseases, and chemically-induced diseases. The remaining thirteen weeks are devoted to an integrated presentation of the most common human diseases organized sequentially by organ system. Teaching modes include team-based exercises, a variety of small group activities guided by faculty, clinically-oriented disease workshops, team-based case discussions, and updated lectures. Credit: 16. Muzyk, Alspaugh, Gunn, Deyrup, and Yee.
**PATHASST 204—Introduction to Practical Anatomic Pathology Techniques.** Students are introduced to autopsy pathology and the daily activities of a busy autopsy service, and to the daily activities in a surgical pathology laboratory. Students become acquainted with the various duties assumed by trained Pathologists’ Assistants and are introduced to basic tissue dissection techniques taught through participation in the surgical pathology service. Lectures in basic medical terminology are presented with emphasis on pathologic, surgical and diagnostic processes. Students are also exposed to educational methodologies in lecture and laboratory settings, medical ethics and professionalism and basic laboratory safety. Credit: 3. P. Vollmer, Riley, and staff

**PATHASST 210 - Introduction to Autopsy Pathology.** This is a summer rotation given during the first summer session. It is designed to re-acquaint the student with autopsy prosection and workup training and experience, building on concepts introduced in PATHASST 204. Students work with the PA on service and assist residents in full autopsy dissections. 2 credits. Glass, Hennessey, Riley, and staff

**PATHASST 215 - Histology Techniques.** Students participate in rotations through the histology laboratory. The rotation is designed to acquaint students with the various laboratory techniques used in tissue processing, routine histology, and special procedures. 1 credit. Su and staff

**PATHASST 217—Molecular Pathology Techniques.** During this one week practical rotation, students are introduced to ancillary diagnostic technologies and techniques used to assess cellular and subcellular pathology, to include immunohistochemistry, flow cytometry, image analysis and electron microscopy in various laboratory settings. Credit: 1. Perkinson and staff

**PATHASST 221 Introduction to Surgical Pathology-Duke.** This is the initial practical rotation conducted during the first summer session. It is designed to re-acquaint students with the techniques of gross dissection, descriptions, and submission of tissue samples from surgical specimens, focusing on small biopsy specimens and building on concepts presented in PATHASST 204. It runs concurrently with PATHASST 222, and is designed to introduce students to the variations and differences between a university medical center and a Veterans Affairs Medical Center’s Surgical Pathology Service. 2 credits. Bentley, Deeny, and staff

**PATHASST 222 Introduction to Surgical Pathology-DVAMC.** This is the initial practical rotation conducted during the first summer session complimenting PATHASST 221. It presents students with the techniques of gross dissection, descriptions, and submission of tissue samples from surgical specimens processed at the Durham Veterans Affairs Hospital’s Surgical Pathology Service. Emphasis is placed on the close interaction with the attending pathologist, pathology resident and their interactions with the surgical team. Students are introduced to tissue triage, slide preparation, frozen section technique and case sign-out logistics, comparing the variations and differences between a university medical center and a Veterans Affairs Hospital Surgical Pathology Services. 2 credits. Lark and staff

**PATHASST 302- Forensic Pathology.** This is a practical rotation at the North Carolina Office of the Chief Medical Examiner observing and participating (on a limited basis) with forensic pathologists performing medical-legal autopsies. 2 credits. Aurelius and staff

**PATHASST 321 (Duke), 322 (DVAH) - Surgical Pathology I - Duke and DVAH.** These courses run concurrently during the fall semester of the second year, and are meant to be complimentary. They are practical rotations on the Duke University and Veterans Affairs Hospital’s Surgical Pathology Services respectively, building on the techniques and skills taught in PATHASST 221 and 222. These courses consist of continuing laboratory training in the orientation, description, and dissection of gross surgical specimens with special emphasis on frozen section technique, tissue triage and the role of the PA and their interaction with the attending pathologist and pathology resident following many of the cases through to sign-out by the pathologist at the DVAH. 4 credits each. Bentley, Deeny, Lark, and staff
PATHASST 323, 324, Autopsy Pathology I, II. These practical rotations during the second year present a detailed consideration of the morphologic, physiologic, and biochemical manifestations of disease. The courses include gross dissection, histologic examinations, processing, and analyzing of all autopsy findings under tutorial supervision. 4 credits each course or 8 total credits. *Glass, Hennessey, Riley, and staff*

**PATHASST 330 - Autopsy Practicum.** This is the final autopsy rotation completed during the summer of the second year of training. Students must perfect their dissection skills, demonstrate the ability to conduct full autopsy prosections in all possible situations, and write full preliminary autopsy reports. In addition, special dissection skills are taught in this course. 3 credits. *Glass, Hennessey, Riley, and staff*

**PATHASST 331 (Duke), 332 (DVAH) - Surgical Pathology II - Duke and DVAH.** These courses run concurrently during the spring semester of the second year, and are meant to be complimentary. They are continuing, practical rotations on the Duke University and Veterans Affairs Hospital’s Surgical Pathology Services respectively, building on the techniques and skills taught in PATHASST 221, 222, 321 and 322. These courses consist of continuing laboratory training in the orientation, description, and dissection of gross surgical specimens with special emphasis on the role of the PA and their interaction with the attending pathologist and pathology resident, following many of the cases through to sign-out by the pathologist at the DVAH. Students also participate in enrichment experiences at one or more external rotation sites during these courses. 7 credits for 331, 4 credits for 332. *Bentley, Deeny, Lark, and staff*

**PATHASST 340, 341 - Photography I, II.** This is an introduction to medical photography. Students become familiar with photography equipment and the fundamentals of gross specimen photography and photomicrography. 1 credit for PATHASST 340 and 2 credits for PATHASST 341. *Conlon*

**PATHASST 351 (Duke), 352 (DVAMC) Surgical Pathology Practicum-Duke and DVAMC.** These are the final surgical pathology rotations completed during the summer of the second year of training both at Duke and the Veterans Affairs Hospital. Students must perfect their dissection skills and demonstrate the ability to orient, dissect, describe, and submit appropriate tissue samples from all commonly encountered surgical pathology specimens. Students also participate in a one week enrichment experience at an external rotation site during these courses. 2 credits each. *Bentley, Deeny, Lark and staff*

**PATHASST 359—Laboratory Technologies and Management.** Students are presented with fundamentals of laboratory management to include regulatory and compliance issues, basic management techniques, laboratory safety and infection control in lectures and practical applications, as well as practical applications of fine needle aspiration and bone marrow aspiration and biopsy. Credit: 2. *Department of Pathology faculty and staff.*

**PATHASST 361, 362 - Pathologic-Basis of Clinical Medicine I, II.** This course consists of lectures and seminars by the departments of Pathology and Medicine faculty emphasizing both basic science and systemic pathologic topics. 3 credits each course. *Department of Pathology and Medicine faculty*

**PATHASST 390- Senior Seminar.** Students complete an independent study under the supervision of a Department of Pathology faculty member or senior pathology resident. Topics are selected from Surgical Pathology or Autopsy Pathology cases, and are researched, developed and presented to the PA Program administration and the Department of Pathology faculty and staff as a final senior seminar. 2 credits. *Bentley and staff*
Degree and Certificate Requirements

After completion of 94 units of graduate credit, including a required comprehensive oral seminar presentation before the Pathology Department faculty and staff, the academic Master of Health Science (MHS) degree and the professional certificate as a Pathologists’ Assistant are awarded. Duke's MHS degree and certificate are prerequisites to take the American Society of Clinical Pathology (ASCP) certification exam for Pathologists Assistants, but passing the ASCP certification examination is not a prerequisite for graduating with the MHS degree or institutional certificate.

Grading and Program Policies

Grades for courses and clinical rotations in the Pathologists’ Assistant curriculum are assigned on the basis of the following: Honors (H), Pass (P), Low Pass (L), and Fail (F). Exceptions are PATHASST 100 and 101 (Human Structure and Function 1 and 2), PATHASST 102 (Body and Disease), PATHASST 302 (Forensic Pathology), PATHASST 340-341 (Photography I and II), PATHASST 361-362 (Pathologic Basis of Clinical Medicine) and PATHASST 390 (Senior Seminar) which are graded as either Pass (P) or Fail (F). PATHASST 222—Introduction to Surgical Pathology—DVAH is graded as Pass (P), low Pass (LP) or Fail (F). A grade of Honors in any didactic course is defined as an overall average score of 90% or greater and an overall average score of less than 70% constitutes failure.

The program is designed to integrate classroom and clinical learning experiences considered necessary for competency as health care providers and each course in the curriculum is required. Therefore, the failure of any course in which the student is unable to successfully remediate will ultimately result in withdrawal from the program. Determination of satisfactory academic progress is made by the program director upon advisement of the program advisory committee.

Please review the Bulletin of the Duke University School of Medicine (https://medschool.duke.edu/education/school-medicine-bulletin) for additional policies of the of the Pathologists’ Assistant Program and School of Medicine.

Facilities

The major facilities supporting this program are the classrooms, laboratories, and libraries of the Duke School of Medicine, and the Autopsy and Surgical Pathology Laboratories at Duke University Hospital and the Durham Veterans Affairs Hospital. The pathology laboratories provide exposure to nearly 375 autopsies and over 55,000 surgical pathology accessions.

The Mary Duke Biddle Trent Semans Center for Health Education (TSC) is a six-story, 104,000-square-foot health education building centrally located on the medical center campus, close to Duke University Hospital, laboratory and research buildings, medical clinics, the Duke Cancer Center and the Duke Medicine Pavilion. Featuring a floor dedicated to simulation laboratories that can transform from mock clinical exam rooms to surgery suites and emergency rooms, the Trent Semans Center also includes a ground floor auditorium, a learning hall, and flexible, state-of-the-art classrooms with moveable walls and chairs to accommodate team-based activities. Spaces on the third and fourth floors provide dedicated study rooms for students and areas where faculty and trainees can meet informally.
The Medical Center Library & Archives is in the Seeley G. Mudd Building, above the Searle Center and connected to the Trent Semans Center for Health Education. The Library & Archives provides the services and collections necessary to further educational, research, clinical, and administrative activities in the medical field. Services are available to faculty, staff, students, and housestaff from Duke Hospital, School of Medicine, School of Nursing, allied health programs, and graduate programs in the basic medical sciences as well as the Duke University Health System. The Library has hundreds of electronic databases and thousands of health sciences journal titles available electronically, though some of the older years may not be accessible online. The print journal collection and books published before 1995 are stored off-site at the Duke Library Service Center. More current print books are kept within the library facility and are available for checkout. The Frank Engel Memorial Collection consists of books on health and nonmedical subjects for general reading as well as newspapers and popular magazines. Library services include reference, in-depth consultations, expert database searching, customized training, and online tutorials. Workstations for searching databases, the catalog, and other resources are available, along with a variety of study spaces and rooms for online booking and a computer classroom for hands-on training.

In addition, students participate in external rotations at the following sites:

1. The office of the Chief Medical Examiner in Raleigh, N.C. The North Carolina Medical Examiner System is a network of medical doctors and allied health professionals throughout North Carolina who voluntarily devote their time, energy, and medical expertise to see that deaths of a suspicious, unusual or unnatural nature are adequately investigated. The OCME investigates all deaths in North Carolina due to injury or violence, as well as natural deaths that are suspicious, unusual, or unattended by a medical professional. This resource is maintained by the Office of the Chief Medical Examiner of the state of North Carolina. The OCME is a branch in the Epidemiology Section of the Division of Public Health. The OCME also functions as the Division of Forensic Pathology of the UNC School of Medicine, Department of Pathology and Laboratory Medicine.

2. The surgical pathology laboratories of the University of North Carolina Hospital in Chapel Hill, N.C. The McLendon Clinical Laboratories (MCL) provide extensive diagnostic services in Anatomic Pathology and in Laboratory Medicine to the University of North Carolina Hospitals.

3. The surgical pathology laboratories of Duke Regional Hospital in Durham, N.C. Duke Regional Hospital serves Durham, Orange, Person, Granville and Alamance counties and the surrounding areas in a community hospital setting.

All students receive a new laptop computer and tablet on entry. Each student is assigned an individual carrel in a dedicated PA student office that is wired for on line services. Internet, Medline, and e-mail addresses are provided for each student. Support is provided by Medical Education Information Technology (MedEdIT) which has a service desk located in the Seeley Mudd/Medical Center Library building, with trained technicians available 8-5 PM Monday-Friday to assist with any technical support needs. MedEdIT can also be reached at: mededit_helpdesk@duke.edu

Class Size

The program accepts 6-8 students for each class.
Admissions Policies

Applicants will submit a completed application form, additional materials, and fees to the Associate Director for review. After review by the admissions committee, selected candidates will be invited for an interview. A review committee consisting of the Program Director, Associate Director and at least three others drawn from either the Medical Director, the Surgical Pathology Training Coordinator, staff pathologists, staff PA's, and 2nd year students will approve all final admissions decisions. Criteria for admission are weighted to academic preparation and performance. Preparation in basic sciences such as biochemistry, cell and molecular biology, genetics, physiology and immunology is preferred, but courses such as gross anatomy, histology and microbiology are also recommended. Surgical pathology laboratory experience and/or the shadowing of a pathologist or pathologists’ assistant are also required, but cannot replace adequate academic preparation.

Prerequisites for Admission

1. A baccalaureate degree in a biological or chemical science from an accredited institution which includes course work in general chemistry, organic chemistry and/or biochemistry, biological science, college mathematics (at least to the level of algebra).
   -or-
   A baccalaureate degree in a non-science major to include the courses defined above and at least 24 credit hours in biological sciences and chemistry of such depth that the admissions committee determines that the candidate has the minimum scientific background to successfully begin the study of medical sciences.

2. Scores for the Graduate Record Examination (GRE) preferred, or Medical College Admissions Test (MCAT) taken within the last five years (no more than 5 years old on January 15 of the year admission is desired) are required. Please note that after January 15, 2020, the MCAT will no longer be accepted in lieu of the GRE. Candidates who receive their baccalaureate degree from institutions outside the United States must submit a transcript evaluation showing degree equivalency and course by course subject matter description, and must submit either TOEFL or IELTS scores (no more than 2 years old) if English is not their native language.

3. A minimum of 10 hours shadowing in anatomic pathology, specifically surgical pathology (preferably in more than one setting), or surgical pathology laboratory work experience is required. Autopsy shadowing is also preferred, but not mandatory.

4. All candidates for the Masters of Health Science degree and certification as Pathologists’ Assistants must possess the physical and mental skills and abilities necessary to successfully complete the training program curriculum. To achieve the optimal educational experience, students are required to participate in all phases of the training program, in compliance with the following Technical Standards:

The study of medicine is not a pure intellectual exercise. Rather, a specific set of minimal physical, mental, emotional and social abilities are needed to be a successful student. Students must possess
all of the abilities listed in the five Technical Standards categories below. The use of an intermediary that would, in effect, require a student to rely on someone else’s power of observation and/or communication will not be permitted.

I. **Observation**
   a) Visually observe materials presented in the learning environment including audiovisual presentations, written documents, microbiology cultures, microscopic examination of microorganisms, tissues and gross organs in the normal and pathologic state, and diagnostic images;
   b) Observe specimens accurately and completely, both at a distance and directly. This requires functional vision, hearing, and sensation.

II. **Communication**
   a) Effectively speak, write, hear, read and use a keyboard utilizing the English language;
   b) Perceive non-verbal communications, including facial expressions, body language, and affect;
   c) Communicate effectively and sensitively with patients and their families via speech as well as reading/writing;
   d) Communicate in oral and written form with the healthcare team in an effective, accurate, and efficient manner.

III. **Motor**
   a) Elicit information from surgical specimens and postmortem examinations by palpation and use of dissection instruments;
   b) Execute movements reasonably required to provide optimal gross analysis of surgical specimens and postmortem examinations. These skills require coordination of gross and fine motor movements, equilibrium, and sensation;
   c) Manipulate equipment and instruments to perform basic dissection procedures as required to attain curricular goals. (e.g., scalpel, forceps, scissors, needles and syringes, large dissection knife, band saw, camera).

IV. **Intellectual/conceptual, Integrative, and Quantitative Abilities**
   a) Perform calculations necessary to solve quantitative problems as required by the curriculum;
   b) Collect, organize, prioritize, analyze and assimilate large amounts of technically detailed and complex information in a timely fashion. This information will be presented in a variety of educational settings, including lectures, small group discussions, and individual clinical settings. The applicant should be able to analyze, integrate, and apply this information appropriately for problem solving and decision-making;
   c) Apply knowledge and reasoning to solve problems as outlined by the curriculum;
   d) Comprehend the three dimensional spatial relationships of structures;
   e) Remain awake and alert.

V. **Behavioral, Emotional and Social Attributes**
   a) Possess the emotional health to fully apply their intellectual skill, exercise good judgment, and to complete all responsibilities attendant to the diagnosis and care of surgical specimens and postmortem examinations;
   b) Develop a mature, sensitive, and effective relationship with patients and colleagues;
   c) Tolerate the physical, mental and emotional stress experienced during training and patient care;
d) Possess qualities of adaptability, flexibility, and the ability to function in the face of uncertainty;
e) Form a compassionate relationship with their patients while maintaining appropriate boundaries for a professional relationship;
f) Behave in an ethical and moral manner consistent with professional values and standards;
g) Exhibit sufficient interpersonal skills, knowledge, and attitudes to interact positively and sensitively with people from all parts of society, ethnic backgrounds, and belief systems;
h) Cooperate with others and work corroboratively as a team.

The faculty of the Duke University School of Medicine’s Pathologists’ Assistant Program recognizes its responsibility to present candidates for the MHS degree and certification that have the knowledge, attitudes, and skills to function in the specialized setting of anatomic pathology.

The Admissions Committee is responsible for adhering to these technical standards during the selection of students for the Pathologists’ Assistant Program.

**Tuition and Fees**

Tuition for the entering class in 2019 is $28,334 per year with yearly technology, insurance and parking fees of approximately $8000. The entering tuition and technology fee costs are guaranteed for the second year and will not increase. Rent, food, books and other miscellaneous costs average approximately $27000.

**Financial Aid**

Unsubsidized Stafford loans are available. Supplemental loans up to the program’s recommended budget are available from private lenders.

For more detailed information, contact:
Office of Financial Aid
Duke University School of Medicine
Box 3067 Duke University Medical Center
Durham, NC 27710
https://medschool.duke.edu/education/student-services/office-financial-aid

**Application Procedures**

The deadline for applications for admission is **January 15** of each year. Application reviews will be completed by mid-February, and selected candidates will be interviewed during the following month. All applicants will be notified of their current status by April 1.

Application forms can be obtained by downloading from our website:
https://pathology.duke.edu/education/pathologists-assistant-program/admissions-application
or by writing: Pamela Vollmer, BHS, PA(ASCP) Associate Director, Pathologists’ Assistant Program, Department of Pathology Box 3712, Duke University Medical Center, Durham, NC 27710;
or by email at pamela.vollmer@duke.edu
The program office telephone number is (919) 684-2159.

Applications must include:

1. A completed Duke University School of Medicine Pathologists’ Assistant Program application form and a non-refundable application fee of $55.00.

2. Official transcripts of all colleges and universities attended.

3. GRE (preferred) or MCAT scores. Scores should be sent to the codes provided in the application form. In addition, scores and percentiles should be written in the application form. Please note that after January 15, 2020, the MCAT will no longer be accepted in lieu of the GRE.

4. Internet-based TOEFL or academic IELTS scores (no more than two years old) are required for international students whose native language is not English. Internet-based TOEFL scores of 115 total or greater and academic IELTS scores of 8 or greater overall are competitive. Scores should be sent to the codes given in the application form.

5. Three letters of recommendation.

INCOMPLETE APPLICATIONS WILL NOT BE REVIEWED

Candidates will be notified of the admission committee's final decisions no later than April 30. Accepted candidates will be required to submit a non-refundable deposit of $450.00 to retain their places in the class, along with a signed copy of the Duke Pathologists’ Assistant Program Technical Standards. This deposit will be applied towards the first semester tuition, fees and criminal background checks.

Duke University Nondiscrimination Statement

Duke University is committed to encouraging and sustaining a learning and work community that is free from prohibited discrimination and harassment. The university prohibits discrimination on the basis of race, color, religion, national origin, disability, veteran status, sexual orientation, gender identity, gender expression, sex, genetic information, or age in the administration of its educational policies, admission policies, financial aid, employment, or any other university program or activity. The university also makes good faith efforts to recruit, employ and promote qualified minorities, women, individuals with disabilities, and veterans. It admits qualified students to all the rights, privileges, programs, and activities generally accorded or made available to students.

The university also does not tolerate harassment of any kind. Sexual harassment and sexual misconduct are forms of sex discrimination and prohibited by the university. Duke University has designated Dr. Benjamin D. Reese, Vice-President for Institutional Equity, as the individual responsible for the coordination and administration of its nondiscrimination and harassment policies. The Office for Institutional Equity is located in Smith Warehouse, 114 S. Buchanan Blvd., Bay 8, Durham, North Carolina 27708. Dr. Reese’s telephone number is (919) 684-8222, and his email address is ben.reese@duke.edu
Questions or comments about harassment or discrimination can be directed to the Office for Institutional Equity, (919) 684-8222. Additional information, including the complete text of the harassment policy and appropriate complaint procedures, may be found by contacting the Office for Institutional Equity, or visiting its website at: www.duke.edu/web/equity/

For further information on notice of nondiscrimination, you can contact the appropriate federal office by visiting the website: wdcrobcoll01.ed.gov/CFAPPS/OCR/contactus.cfm for the address and phone number of the office that serves your area, or call 1 (800) 421-3481

Program Outcomes

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***Information incomplete; to date all graduates who have taken the exam have passed