GOALS AND OBJECTIVES OF THE PROGRAM

Main goal of the program

Our educational philosophy is based upon the premise that the discipline of neuropathology is firmly rooted in a solid academic background, whether it is practiced in a traditional academic institution, a community/private practice setting, or a forensic setting. Consequently, the primary goal of our training program is to prepare candidates for an academically-oriented career that encompasses any combination of diagnosis, research, and teaching, and emphasizes the concept of lifelong learning. The program is structured to meet this goal through exposure of the fellow to 1) an abundance of diversified case material, 2) faculty members with a variety of clinical and research interests and capabilities and a commitment to medical teaching, who can serve as mentors and role models, 3) state of the art clinical and research laboratory support facilities, and 4) a graduated program of assigned responsibilities. By the completion of training, all Neuropathology fellows should be competent to practice at the level of a newly board certified practitioner in Neuropathology in all 6 of the core competency areas as defined by the ACGME.

Objectives of the fellowship program in the six core competencies

I. Patient Care

Fellows must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health. Fellows:

- must demonstrate a satisfactory level of diagnostic competence and the ability to provide appropriate and effective consultation in the context of pathology services
- must actively participate in the evaluation of a comprehensive body of pathological lesions of the central nervous system, peripheral nervous system, and neuromuscular systems
- should have the opportunity to develop competence in morphologic assessment of diseases of muscle and peripheral nerves, including morphometric analysis and teased nerve fiber preparations, and to study neoplasms and related lesions of peripheral nerves and the sympathetic and parasympathetic nervous systems
- must perform at least 200 necropsies that include examination of the nervous system (these may include brains seen in consultation, brains from complete autopsies, or brain only autopsies)
- must examine at least 300 neurosurgical specimens (including consultations) from the brain, spinal cord, pituitary gland, and eyes (including neoplastic, degenerative, infectious, and immune disorders of significance in the treatment and management of pediatric and adult patients)
- must perform at least 50 intraoperative neurosurgical consultations
II. **Medical Knowledge**

Fellows must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological and social-behavioral sciences, as well as the application of this knowledge to patient care. Fellows:

- must demonstrate knowledge about established and evolving biomedical, clinical and cognate (e.g. epidemiological and social-behavioral) sciences and the application of this knowledge to pathology
- should regularly participate in basic neuroscience activities, teaching conferences in neuropathology, and joint conferences with the pathology department and clinical services involved in the diagnosis and management of neurological disorders
- must learn to integrate neuropathologic information into medical consultations with clinicians in the diagnosis and management of patients
- should be provided with exposure to neuro-oncology and neurogenetics.

III. **Practice Based Learning and Improvement**

Fellows must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and life-long learning. Fellows are expected to develop skills and habits to be able to meet the following goals:

- identify strengths, deficiencies, and limits in one’s knowledge and expertise
- set learning and improvement goals
- identify and perform appropriate learning activities
- systematically analyze practice using quality improvement methods, and implement changes with the goal of practice improvement
- incorporate formative evaluation feedback into daily practice
- locate, appraise, and assimilate evidence from scientific studies related to their patients’ health problems
- use information technology to optimize learning
- participate in the education of patients, families, students, fellows and other health professionals
- investigate and evaluate their diagnostic and consultative practices, appraise and assimilate scientific evidence and improve their patient care practices.
IV. **Interpersonal and Communication Skills**

Fellows must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals. Fellows are expected to:

- communicate effectively with patients, families, and the public, as appropriate, across a broad range of socioeconomic and cultural backgrounds
- communicate effectively with physicians, other health professionals, and health related agencies
- work effectively as a member or leader of a health care team or other professional group
- act in a consultative role to other physicians and health professionals
- maintain comprehensive, timely, and legible medical records, if applicable.
- demonstrate interpersonal and communication skills that result in effective information exchange and teaming with other health care providers, patients, and patients’ families.

V. **Professionalism**

Fellows must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. Fellows are expected to demonstrate:

- compassion, integrity, and respect for others
- responsiveness to patient needs that supersedes self-interest
- respect for patient privacy and autonomy
- accountability to patients, society and the profession
- sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation
- commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population.

VI. **Systems-Based Practice**

Fellows must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care. Fellows are expected to:

- work effectively in various health care delivery settings and systems relevant to their clinical specialty
• coordinate patient care within the health care system relevant to their clinical specialty

• incorporate considerations of cost awareness and risk-benefit analysis in patient and/or population-based care as appropriate

• advocate for quality patient care and optimal patient care systems

• work in interprofessional teams to enhance patient safety and improve patient care quality

• participate in identifying system errors and implementing potential systems solutions.

• demonstrate an awareness and responsiveness to the larger context and system of health care and the ability to call on system resources to provide pathology services that are of optimal value.

COMPETENCY-BASED GOALS AND OBJECTIVES FOR ROTATIONS

Fellows have graduated clinical responsibilities based upon their level of training. During at least 6 months of the first year of fellowship, fellows gain diagnostic experience as they evaluate all brain biopsies, autopsy brain cases, neuromuscular biopsies, and outside consultation cases submitted to Neuropathology during their on-service time. Cases are first evaluated independently by the fellow, and then reviewed for signout with Neuropathology attending staff.

During the course of their first year of fellowship, fellows are expected to progress from passive observation to taking increasing responsibility for workup of clinical cases. Thus, in their second year of training, Neuropathology fellows assume greater responsibility for frozen section coverage on neurosurgical biopsy cases, signout of autopsy and neurosurgical biopsy cases, and in conducting hospital and forensic brain cutting conferences (all under the supervision of the Neuropathology faculty). Each fellow has primary responsibility for one of these service functions for 6 of the 12 months of year 2. Neuropathology fellows also share responsibility with Neuropathology faculty for presentations at clinical case conferences in the Departments of Pathology, Neurology, and Neurological Surgery, including preparation of gross and microscopic photographs, clinical protocols, and references.

Neuromuscular biopsy service

I. Patient Care

1) Be able to communicate effectively with referring pathologists and clinicians about the proper handling and shipping of neuromuscular biopsies performed at off-campus sites.

2) Become well acquainted with the first steps in the technical preparation of all neuromuscular biopsy material, including:
   a) proper freezing techniques for muscle biopsies
   b) proper fixation techniques for muscle and nerve biopsies
   c) proper gross sectioning of nerve and muscle biopsies

3) Become familiar with the basic details of enzyme histochemical and immunohistochemical staining, in order to effectively troubleshoot technical problems.

4) Understand the technical steps involved in teased fiber preparations.
5) Review paperwork on all biopsies received in the lab for possible preliminary frozen section evaluation and/or any other “special” requirements. This should be immediately followed by a discussion of the case with the attending neuropathologist.

6) Generate a draft written diagnosis on all preliminary frozen section biopsies, for review by the attending neuropathologist.

7) Review all relevant clinical information and laboratory data for correlation with pathologic findings. For on-campus patients, this includes searching institutional electronic medical records systems accessible through networked computers in Neuropathology.

8) Cut in gross specimens in a timely fashion. This should initially be done under the direct supervision of the attending neuropathologist, who will then make an assessment of when the fellow can function independently.

9) Independently review slides on all biopsies, including preliminary frozen sections.
   a) Become proficient in the evaluation of muscle enzyme histochemical and immunohistochemical preparations, including assessment of specimen quality, and with emphasis on clinico-pathologic correlation.
   b) Become proficient in the light microscopic evaluation of peripheral nerve biopsies in cryostat, paraffin, and plastic-embedded material, and teased fiber preparations.

10) Select blocks for electron microscopy; become proficient in the performance of ultrastructural examination of muscle and nerve tissue, and be able to recognize the ultrastructural features that differentiate specific neuromuscular disorders. In order to make efficient use of the EM laboratory, until proficiency is gained, each of these procedures should be done with the attending neuropathologist.

11) Generate a written diagnosis and a draft narrative comment on all neuromuscular biopsies, taking into account all clinical and laboratory data and morphologic findings. This draft should be made available to the attending neuropathologist for review at the time the case is jointly reviewed. In order to avoid placing an excessive burden on the secretarial staff, reports by the fellow should be written (not dictated), until the attending neuropathologist determines that the fellow is proficient at generating reports.

12) Enter appropriate diagnostic and topographic SNOMED codes into computer database upon final signout of case.

II. Medical Knowledge

1) Understand the clinical indications for muscle and nerve biopsies, the disease processes likely to affect them, and the diagnostic features that characterize those disorders.

2) Understand the clinical indications for preliminary frozen section evaluation of muscle and nerve biopsies.

3) Become familiar with the diagnostic indications for, and limitations of, ultrastructural evaluation of muscle and nerve biopsies.

III. Practice-based Learning and Improvement

1) Refer to medical textbooks and current literature references and utilize information technology to broaden your scope of knowledge about the types of diagnostic cases in which you are involved.

2) Utilize feedback from both informal and formal evaluations to improve clinical skills.

3) Actively seek out additional professional experience over that which is the minimum required.

4) Participate actively in teaching students, residents, and other healthcare professionals, recognizing that effective teaching requires insight into the deficiencies in one’s own knowledge.
5) Participate in the formulation and implementation of quality assurance monitors, including peer review activities such as semiweekly Neuropathology Case Review Conference.

IV. Interpersonal and Communication Skills

1) Be able to explain how to perform a diagnostic muscle or nerve biopsy.
2) Be able to work with laboratory and administrative staff to solve problems.
3) Be able to write diagnoses and reports in standard English.
4) Be able to explain diagnoses and implications for therapy and prognosis.
5) At the discretion of the attending neuropathologist, verbally communicate the results of biopsy evaluations to referring physicians.
6) Be prepared to present appropriately chosen cases at the semi-weekly Neuropathology Case Review Conference.
7) Attend the weekly interdisciplinary neuromuscular biopsy conference and present biopsy findings to other attendees.

V. Professionalism

1) Demonstrate respect for patients, families, and all members of the healthcare team.
2) Demonstrate honesty and integrity in all interactions with patients, families, and members of the healthcare team.
3) Demonstrate sensitivity to issues of age, race, gender, and religion with patients, families, and members of the healthcare team.
4) Delay personal wants in order to complete professional duties on time.
5) Actively recognize, admit, and move to correct mistakes.
6) Be aware of institutional requirements and general ethical guidelines for maintaining confidentiality of patient personal health information.

VI. Systems-Based Practice

1) Work effectively with neuromuscular and other clinicians, neuropathology faculty and laboratory and office staff, referring institutions, and other members of the healthcare team to provide coordinated patient care.
2) Incorporate considerations of cost awareness and risk-benefit analysis into patient care decisions as appropriate.
3) Recognize practices in the laboratory that affect patient safety, including specimen labeling errors; work to correct any such errors that occur; and help to develop systematic improvements to prevent recurrent patient safety errors.
4) Be knowledgeable about regulatory compliance requirements for the laboratory, how those requirements are designed to promote improved patient care, and the implications of non-compliance.

Neurosurgical biopsy service

I. Patient Care

1) Be able to communicate effectively with referring neurosurgeons about the proper sampling and submission of neurosurgical biopsies with specific reference to differential diagnostic considerations.
2) Understand the clinical indications for, and limitations of, preliminary frozen section evaluation (including the use of smear preparations) of nervous system tissues.
3) Review daily surgery schedules (posted in Neuropathology) to identify potential frozen section cases.
4) Attend all intraoperative frozen sections during assigned rotation (including those that occur outside of normal office hours).
5) Become proficient in the preparation of intraoperative frozen sections and smears of nervous system tissue, including tissue sampling, freezing and staining techniques, and technical limitations of frozen sections and smears.
6) Review frozen sections and smears with attending neuropathologist and discuss diagnostic considerations in light of clinical information and radiographic features.
7) Perform histologic sampling for permanent sections and be able to dictate an accurate specimen description.
8) Review all relevant clinical information, laboratory data, and radiographs for correlation with pathologic findings. This includes searching institutional electronic medical records systems accessible through networked computers in Neuropathology.
9) Become proficient in the light microscopic evaluation of neurosurgical biopsy preparations, with emphasis on clinico-pathologic and radiographic-pathologic correlation.
10) Become familiar with the diagnostic indications for, and limitations of, special histologic stains, immunohistochemical stains, and ultrastructural evaluation of neurosurgical biopsies, and become proficient in their interpretation.
11) See that appropriate special studies (e.g., immunohistochemical stains) are ordered correctly and in a timely manner, and reviewed.
12) Know the appropriate elements for inclusion in describing and reporting of neurosurgical biopsies.
13) Generate a written diagnosis and a draft narrative comment on all neurosurgical biopsies, taking into account all clinical and laboratory data, radiographic findings, and morphologic findings. This draft should then be submitted to the attending neuropathologist for review and final editing and signing.
14) Review permanent sections and draft report of biopsy cases at daily neurosurgical biopsy signouts with attending neuropathologist and any rotating residents also assigned to the neurosurgical biopsy service.
15) Enter appropriate diagnostic and topographic SNOMED codes into computer database upon final signout of case.

II. Medical Knowledge

1) Understand the clinical indications for neurosurgical biopsies, the disease processes likely to affect the brain and spinal cord and adjacent tissues, and the diagnostic features that characterize those disorders.
2) Understand the clinical indications for and limitations of preliminary frozen section evaluation of neurosurgical biopsies.

III. Practice Based Learning and Improvement

1) Refer to medical textbooks and current literature references and utilize information technology to broaden your scope of knowledge about the types of diagnostic cases in which you are involved, and improve your problem-solving abilities.
2) Utilize feedback from both informal and formal evaluations to improve clinical skills.
3) Actively seek out additional professional experience over that which is the minimum required.
4) Participate actively in teaching students, residents, and other healthcare professionals, recognizing that effective teaching requires insight into the deficiencies in one’s own knowledge.
5) Participate in the formulation and implementation of quality assurance monitors, including peer review activities such as semiweekly Neuropathology Case Review Conference.

IV. Interpersonal and Communication Skills

1) Be able to explain, in general terms, how to perform a diagnostic neurosurgical biopsy.
2) Be able to work with laboratory, operating room, and administrative staff to solve problems.
3) Be able to write diagnoses and reports in standard English.
4) Be able to explain diagnoses and implications for therapy and prognosis.
5) Be able to communicate frozen section findings to neurosurgeons intraoperatively.
6) At the discretion of the attending neuropathologist, verbally communicate the results of final biopsy reviews to referring physicians.
7) Be prepared to present appropriately chosen cases at the semi-weekly Neuropathology Case Review Conference.
8) Attend the weekly interdisciplinary Neuro-oncology Conference and present biopsy findings to other attendees.

V. Professionalism

1) Demonstrate respect for patients, families, and all members of the healthcare team.
2) Demonstrate honesty and integrity in all interactions with patients, families, and members of the healthcare team.
3) Demonstrate sensitivity to issues of age, race, gender, and religion with patients, families, and members of the healthcare team.
4) Delay personal wants in order to complete professional duties on time.
5) Actively recognize, admit, and move to correct mistakes.
6) Be aware of institutional requirements and general ethical guidelines for maintaining confidentiality of patient personal health information.

VI. Systems-Based Practice

1) Work effectively with neurosurgical and other clinicians, neuropathology faculty and laboratory and office staff, referring institutions, and other members of the healthcare team to provide coordinated patient care.
2) Incorporate considerations of cost awareness and risk-benefit analysis into patient care decisions as appropriate.
3) Recognize practices in the laboratory that affect patient safety, including specimen labeling errors; work to correct any such errors that occur; and help to develop systematic improvements to prevent recurrent patient safety errors.
4) Be knowledgeable about regulatory compliance requirements for the laboratory, how those requirements are designed to promote improved patient care, and the implications of non-compliance.

Hospital braincutting

I. Patient Care

1) Review weekly case list, researching pertinent topics as needed.
2) Cut brains at weekly conference under the supervision of the attending neuropathologist.
3) Become proficient in the gross dissection and histologic sampling of postmortem brain and spinal cord specimens.
4) Assist pathology residents responsible for autopsy case in documenting pertinent gross findings in photographs.
5) Assist residents in taking microscopic sections as necessary.
6) Become proficient in the microscopic evaluation of brain and spinal cord specimens, with emphasis on clinico-pathologic and radiographic-pathologic correlation.
7) Review H&E-stained slides prepared in Neuropathology histology lab; order special stains as necessary, coordinating with Pathology resident and attending pathologist responsible for case, and attending Neuropathology staff member.
8) Become familiar with the diagnostic indications for, and limitations of, special histologic stains, immunohistochemical stains, and ultrastructural evaluation of CNS autopsy tissues, and become proficient in their interpretation.
9) Review all relevant clinical information, laboratory data, and radiographs for correlation with pathologic findings. This includes searching institutional electronic medical records systems accessible through networked computers in Neuropathology.
10) Review microscopic sections with attending Neuropathologist.
11) Make written notes on braincutting forms for incorporation into autopsy report by resident and attending pathologist responsible for case.
12) Enter appropriate diagnostic and topographic SNOMED codes into computer database upon final review of case.

II. Medical Knowledge

1) Become familiar with normal gross and microscopic brain and spinal cord anatomy and be able to recognize disease-related deviations from normal anatomy and histology.
2) Understand the clinical indications for autopsy evaluation of central and peripheral nervous system tissues, the disease processes likely to affect them, and the diagnostic features that characterize those disorders.
3) Understand the implications of systemic conditions in producing pathologic lesions in the nervous system.

III. Practice-based Learning and Improvement

1) Refer to medical textbooks and current literature references and utilize information technology to broaden your scope of knowledge about the types of diagnostic cases in which you are involved, and improve your problem-solving abilities.
2) Utilize feedback from both informal and formal evaluations to improve clinical skills.
3) Actively seek out additional professional experience over that which is the minimum required.
4) Participate actively in teaching students, residents, and other healthcare professionals, recognizing that effective teaching requires insight into the deficiencies in one’s own knowledge.
5) Participate in the formulation and implementation of quality assurance monitors, including peer review activities such as semiweekly Neuropathology Case Review Conference.

IV. Interpersonal and Communication Skills

1) Be able to explain how to perform autopsy evaluation of brain, spinal cord, or peripheral nervous system tissues.
2) Be able to work with laboratory and administrative staff to solve problems.
3) Be able to write diagnoses and reports in standard English.
4) Be able to explain diagnoses and implications for clinicopathologic correlation.
5) Elucidate important points of cases and the underlying pathogenesis and etiology, if possible, in group discussion. Discuss differential diagnoses where pertinent.
6) Discuss normal anatomy as appropriate.
7) Be prepared to present appropriately chosen cases at the semi-weekly Neuropathology Case Review Conference.
8) Be available to residents and faculty for review and consultation on cases.

V. Professionalism
1) Demonstrate respect for patients, families, and all members of the healthcare team.
2) Demonstrate honesty and integrity in all interactions with patients, families, and members of the healthcare team.
3) Demonstrate sensitivity to issues of age, race, gender, and religion with patients, families, and members of the healthcare team.
4) Delay personal wants in order to complete professional duties on time.
5) Actively recognize, admit, and move to correct mistakes.
6) Be aware of institutional requirements and general ethical guidelines for maintaining confidentiality of patient personal health information.

VI. Systems-Based Practice
1) Work effectively with clinicians, neuropathology faculty and laboratory and office staff, referring institutions, and other members of the healthcare team to provide coordinated patient diagnostic services.
2) Incorporate considerations of cost awareness and risk-benefit analysis into patient care decisions as appropriate.
3) Be knowledgeable about regulatory compliance requirements for the laboratory, how those requirements are designed to promote improved patient care, and the implications of non-compliance.

Forensic braincutting
I. Patient Care
1) Review weekly case list, researching pertinent topics as needed
2) Cut brains at weekly conference under the supervision of the attending neuropathologist.
3) Become proficient in the gross dissection and histologic sampling of postmortem brain and spinal cord specimens.
4) Assist in documenting pertinent gross findings in photographs.
5) Take microscopic sections as necessary.
6) Dictate accurate gross descriptions and initial diagnostic impressions for preliminary report.
7) Correct transcriptions of preliminary reports in a timely manner, and forward to attending Neuropathologist for additions or corrections and signature prior to distribution to medical examiners.
8) Become proficient in the microscopic evaluation of brain and spinal cord specimens, with emphasis on clinico-pathologic correlation.
9) Review H&E-stained slides prepared in Neuropathology histology lab; order special stains as necessary.
10) Become familiar with the diagnostic indications for, and limitations of, special histologic stains, immunohistochemical stains, and ultrastructural evaluation of CNS autopsy tissues, and become proficient in their interpretation.
11) Review microscopic sections with attending Neuropathologist, and dictate microscopic findings and interpretative comments.
12) Correct transcriptions of final reports, and forward to attending Neuropathologist for additions or corrections and signature prior to distribution to medical examiners.
13) Enter appropriate diagnostic and topographic SNOMED codes into computer database upon final signout of case.

II. Medical Knowledge

1) Become familiar with normal gross and microscopic brain and spinal cord anatomy and be able to recognize disease-related deviations from normal anatomy and histology, especially with respect to forensic/medicolegal considerations.
2) Understand the clinical indications for forensic autopsy evaluation of central and peripheral nervous system tissues, the disease processes likely to affect them, and the diagnostic features that characterize those disorders.
3) Understand the role of trauma in producing pathologic lesions in the nervous system, and how to differentiate traumatic from other (e.g., natural disease) lesions.

III. Practice-based Learning and Improvement

1) Refer to medical textbooks and current literature references and utilize information technology to broaden your scope of knowledge about the types of diagnostic cases in which you are involved, and improve your problem-solving abilities.
2) Utilize feedback from both informal and formal evaluations to improve clinical skills.
3) Actively seek out additional professional experience over that which is the minimum required.
4) Participate actively in teaching students, residents, and other healthcare professionals, recognizing that effective teaching requires insight into the deficiencies in one's own knowledge.
5) Participate in the formulation and implementation of quality assurance monitors, including peer review activities such as semiweekly Neuropathology Case Review Conference.

IV. Interpersonal and Communication Skills

1) Be able to explain how to perform autopsy evaluation of brain, spinal cord, or peripheral nervous system tissues.
2) Be able to work with laboratory, forensic, and administrative staff to solve problems.
3) Be able to write diagnoses and reports in standard English.
4) Be able to explain diagnoses and implications for clinicopathologic correlation.
5) Elucidate important points of cases and the underlying pathogenesis and etiology, if possible, in group discussion. Discuss differential diagnoses where pertinent.
6) Discuss normal anatomy as appropriate.
7) Be prepared to present appropriately chosen cases at the semi-weekly Neuropathology Case Review Conference and the weekly Forensic Neuropathology Slide Review Conference.
8) Be available to residents, forensic fellows, and faculty for review and consultation on cases.

V. Professionalism

1) Demonstrate respect for patients, families, and all members of the healthcare team.
2) Demonstrate honesty and integrity in all interactions with patients, families, and members of the healthcare team.
3) Demonstrate sensitivity to issues of age, race, gender, and religion with patients, families, and members of the healthcare team.
4) Delay personal wants in order to complete professional duties on time.
5) Actively recognize, admit, and move to correct mistakes.
6) Be aware of institutional requirements and general ethical guidelines for maintaining confidentiality of patient personal health information.

VI. Systems-Based Practice

1) Work effectively with forensic faculty and staff, neuropathology faculty and laboratory and office staff, referring institutions, and other members of the healthcare team to provide coordinated patient diagnostic services.
2) Incorporate considerations of cost awareness and risk-benefit analysis into patient care decisions as appropriate.
3) Recognize practices in the laboratory that affect medicolegal findings, including specimen labeling errors; work to correct any such errors that occur; and help to develop systematic improvements to prevent recurrent these errors.
4) Be knowledgeable about regulatory compliance requirements for the laboratory, how those requirements are designed to promote improved patient care, and the implications of non-compliance.

Consultation service

I. Patient Care

1) Be able to communicate effectively with referring physicians and laboratories about the proper submission of consultation material, including supporting documentation and radiographs as appropriate.
2) Review submitted paperwork, clinical information, radiographs, slides, and any other material submitted on all consultation cases assigned by an attending neuropathologist.
3) Become proficient in the light microscopic evaluation of submitted consultation material, with emphasis on clinico-pathologic correlation.
4) Become familiar with the diagnostic indications for, and limitations of, special histologic stains, immunohistochemical stains, and ultrastructural evaluation of consultation material, and become proficient in their interpretation.
5) Review case preliminarily with attending neuropathologist who assigned case, and see that appropriate special studies (e.g., immunohistochemical stains) are ordered correctly and in a timely manner.
6) Review all special studies with attending neuropathologist.
7) Generate a written diagnosis and a draft narrative comment on case. This should be made available to the attending neuropathologist for review at the time the case is jointly reviewed in final form. In order to avoid placing an excessive burden on the secretarial staff, reports by the fellow should be written (not dictated), until the attending neuropathologist determines that the fellow is proficient at generating reports.
8) Enter appropriate diagnostic and topographic SNOMED codes into computer database upon final signout of case.

II. Medical Knowledge

1) Understand the clinical indications for seeking neuropathology consultation.
III. Practice-based Learning and Improvement

1) Refer to medical textbooks and current literature references and utilize information technology to broaden your scope of knowledge about the types of diagnostic cases in which you are involved, and improve your problem-solving abilities.
2) Utilize feedback from both informal and formal evaluations to improve clinical skills.
3) Actively seek out additional professional experience over that which is the minimum required.
4) Participate actively in teaching students, residents, and other healthcare professionals, recognizing that effective teaching requires insight into the deficiencies in one’s own knowledge.
5) Participate in the formulation and implementation of quality assurance monitors, including peer review activities such as semiweekly Neuropathology Case Review Conference.

IV. Interpersonal and Communication Skills

1) Be able to explain how to submit patient material for diagnostic consultation.
2) Be able to work with laboratory and administrative staff to solve problems.
3) Be able to write diagnoses and reports in standard English.
4) Be able to explain diagnoses and implications for therapy and prognosis.
5) Be prepared to present appropriately chosen cases at the semi-weekly Neuropathology Case Review Conference.

V. Professionalism

1) Demonstrate respect for patients, families, and all members of the healthcare team.
2) Demonstrate honesty and integrity in all interactions with patients, families, and members of the healthcare team.
3) Demonstrate sensitivity to issues of age, race, gender, and religion with patients, families, and members of the healthcare team.
4) Delay personal wants in order to complete professional duties on time.
5) Actively recognize, admit, and move to correct mistakes.
6) Be aware of institutional requirements and general ethical guidelines for maintaining confidentiality of patient personal health information.

VI. Systems-Based Practice

1) Work effectively with referring clinicians and pathologists, neuropathology faculty and laboratory and office staff, referring institutions, and other members of the healthcare team to provide coordinated patient care.
2) Incorporate considerations of cost awareness and risk-benefit analysis into patient care decisions as appropriate.
3) Recognize practices in the laboratory that affect patient safety, including specimen labeling errors; work to correct any such errors that occur; and help to develop systematic improvements to prevent recurrent patient safety errors.
4) Be knowledgeable about regulatory compliance requirements for the laboratory, how those requirements are designed to promote improved patient care, and the implications of non-compliance.


**Research rotation**

I. Patient Care

1) Understand and appreciate the role of biomedical research, whether basic, clinical, or translational, in improving the quality of patient care.

2) Understand how critical thinking, fostered by participation in structured research projects, can aid in the scientific approach to patient care.

II. Medical Knowledge

1) Know and understand the background, significance, and preliminary observations that led to the need to address a particular research question.

2) Utilize the research project as a mechanism to gain knowledge about and experience in contemporary neuroscience research techniques.

III. Practice-based Learning and Improvement

1) Approach the research project through rigorous application of the scientific method and a focus on hypothesis generation and testing.

2) Refer to medical textbooks and current literature references and utilize information technology to broaden your scope of knowledge about the research hypothesis to be tested.

3) Apply proper methods of experimental design, statistical analysis, and interpretation of results.

4) Utilize feedback from both informal and formal evaluations to improve investigative and writing skills.

5) Participate actively in teaching students, residents, and faculty about the research project, recognizing that effective teaching requires insight into the deficiencies in one's own knowledge.

6) Participate in the formulation and implementation of quality assurance monitors relative to the research project, to ensure that results are accurate and reliable.

IV. Interpersonal and Communication Skills

1) Be able to explain both the scientific basis and the technical aspects of the research project.

2) Be able to work with laboratory and administrative staff to solve problems.

3) Be able to write progress reports, abstracts, and manuscripts in standard English.

4) Be able to explain the significance and implications of research data generated.

5) Able to present research data at internal conferences and professional meetings.

6) Able to publish clinical or research papers in peer-reviewed journals.

V. Professionalism

1) Demonstrate respect for all members of the research team.

2) Demonstrate honesty and integrity in all interactions with the research team.

3) Actively recognize, admit, and move to correct mistakes.

4) Be aware of institutional and funding agency requirements and general ethical and scientific guidelines for conducting research projects.
VI. Systems-Based Practice

1) Work effectively with faculty mentors, peers, and laboratory and office staff to provide a logical and coordinated approach to the research project.

2) Incorporate considerations of cost awareness and risk-benefit analysis into decisions about research methods employed.

3) Be knowledgeable about regulatory compliance requirements for the research laboratory, and how those requirements are designed to promote an optimal research environment and responsible use of research funding.