Hofstra Northwell School of Medicine
Department of Neurology
Epilepsy Fellowship Program

Skills and Competencies
Rotation Goals and Objectives

The purpose of the Epilepsy fellowship program is to provide a solid foundation in adult and pediatric clinical epilepsy care and in the technical, interpretive, and clinical aspects of EEG with the aim that, upon graduation, fellows will be able to function independently as epileptologists. The Fellowship Program relies on case-based learning, conferences, and didactic lectures to achieve its educational objectives and to prepare fellows for successful completion of the ABPN subspecialty certification in Epilepsy. There will be a broad and in-depth clinical experience with the Epilepsy Service at Northwell Health pertaining to the medical and surgical management of seizure disorders.

North Shore University Hospital, Lenox Hill Hospital, and Cohen Childrens Medical Center are NAEC accredited Level 4 Epilepsy Centers. Long Island Jewish Medical Center is a Level 3 Epilepsy Center. The Epilepsy Division is directed by Dr. Fred Lado and includes an epilepsy monitoring unit (EMU), a long term monitoring (LTM) and inpatient consultation service, an outpatient epilepsy clinic, an active epilepsy surgery program directed by Dr. Ashesh Mehta, and an epilepsy research program including both clinical and basic science endeavors. The didactics include a structured lectures series, clinical and scientific weekly conferences, journal clubs, case conferences, and research meetings. Fellows will gain valuable teaching experience with exposure to Neurology residents and medical students.

Skills and Competencies: By the end of the fellowship, the fellow will:

- Interview and examine patients with epilepsy and seizures related disorders in a thorough and relevant manner.
- Generate an appropriate differential diagnoses for patients presenting with seizures and epilepsy.
- Determine the appropriate medical and surgical diagnostic investigations to proceed with when concerned about a seizure related diagnosis.
- Medically and surgically manage both inpatients and outpatients with seizure disorders.
- Discuss pharmacologic and non-pharmacologic treatment options, co-morbidities, and prognosis in epilepsy and seizure related disorders.
- Integrate basic science, physiology, genetics, and epidemiology of seizures and epilepsy into patient care.
- Perform diagnostic testing in epilepsy, including the review and reporting of routine EEGs, video EEG monitoring, intracranial monitoring, Wada testing and electrical stimulation mapping.
- Understand and discuss the significance and utility of neuroimaging modalities in epilepsy, such as MRI, PET, and SPECT.
- Deliver clear and succinct written and oral presentations of clinical cases and EEG findings.
- Demonstrate reliable and accurate documentation consistent with the best standards of care and practice.
- Identify neuropsychiatric comorbidities related to epilepsy and epilepsy treatments, and appropriate options for referral.
• Critically appraise the epilepsy literature, and incorporate evidence based medicine into clinical practice.

Goals and Educational Objectives:

Rotation: Epilepsy Monitoring Unit (EMU)

Description: One month per rotation, six months per year (mandatory). The EMU is located on the neurology ward at North Shore University Hospital (NSUH) and has four dedicated rooms with hardwired video-EEG equipment and two additional rooms with network capability which can be used for this purpose, for a total of six beds. A separate reading room is used for review and interpretation of the studies. A faculty member is assigned each month to supervise the fellow during the rotation and will round each morning with the fellow in the EEG Reading Room (except when fellows are in seizure clinic).

During their EMU rotation, fellows will gain clinical experience with the care of adults with epilepsy and seizure related disorders. Fellows will oversee the admission of patients to the EMU and review the associated video-EEG studies. In the latter portions of the day, the fellows will be expected to read and report ambulatory EEG studies. Outpatient experiences in epilepsy and sleep medicine are interspersed throughout the month. During this month, fellows will attend the Seizure Clinic at Long Island Jewish Medical Center (LIJMC) on three Monday mornings (except for the first day of the month and holidays), and spend one half day reading sleep studies with a member of the sleep medicine faculty. Supervising faculty will evaluate each fellow quarterly (using the New Innovations website) as well as provide verbal feedback throughout the rotation.

Rotation Goals:
Patient Care and Procedural Skills
• Demonstrate compassionate care to patients with seizure related disorders.
• Accurately diagnose seizure related disorders, including ordering appropriate diagnostic testing.
• Recognize epilepsy related comorbidities and work with others to obtain appropriate care for the patient.
• In the outpatient setting, be exposed to the appropriate long term management of patients living with epilepsy.
• Become familiar with the use of neurostimulation treatments for epilepsy.
• Review and document EEG studies both on an inpatient and outpatient basis.
• Interpret and review sleep study data.

Medical Knowledge
• Recognize, through exposure to diverse patients, various seizure types and mimics with their associated semiology, underlying physiology, epidemiology, genetics, electrographic findings, and associations with various syndromes.
• Discuss anticonvulsant selection, pharmokinetics, interactions, and side effects.
• Participate in and discuss presurgical planning, review of neuroimaging modalities, Wada testing, intracranial monitoring methods, and electrical stimulation mapping with selected patients.

Practice-based Learning and Improvement
• Devise and implement quality improvement measures.
I Incorporate didactics on best practices and evidence based scientific literature into patient care practice.

Interpersonal and Communication Skills
- Present clinical cases and electrographic data to other physicians, patients, and families to assure the appropriate level of understanding.

Professionalism
- Demonstrate behaviors of a respectful, timely efficient, compassionate and responsible clinician, including via direct patient care and documentation.

Systems-based Practice
- In a professional environment, supervise a multidisciplinary care team, direct patient management, and educate other team members.

Objectives:
- Oversee the conduction of all EMU neurophysiologic studies and administer care to the patients admitted to the EMU.
- Insure a proper history and examination is obtained from the patient, and that the newly admitted patient has a clear plan of care that has been reviewed and discussed with the supervising attending. Review the history and physical note from the resident team, referring physician’s office notes; and make contact as needed with family or healthcare providers if additional information is needed.
- Efficiently interview patients in an empathetic and sensitive manner.
- Discern exam findings related to a potentially epileptogenic lesion.
- Review EEG and trend analysis data at a minimum of once daily and more frequently as required, review pertinent findings with a designated faculty member.
- Generate preliminary reports of EMU studies. Review and finalize reports with a faculty member, with immediate feedback, if required.
- Integrate the EEG monitoring results with other clinical information in make proper contextual interpretation, to determine the appropriate duration of epilepsy unit hospitalization and video-EEG studies, and decide upon the next steps in management.
- Advise the resident care team about the EEG findings and management recommendations as required.
- Communicate EEG findings and suggestions to patients and to referring physicians.
- Assist technologists in solving technical issues and optimizing the quality of the recordings. Assist in case review and EEG technologist education, including once monthly for an hour during the EEG Technologist Case Review Conference.
- Coordinate with nursing, social work, neuropsychology, and psychiatry to obtain the proper services required to deal with psychological or cognitive patient comorbidities or social concerns.
- Read and report ambulatory EEG studies performed at the outpatient office. Recognize the different types of EEG studies and challenges that exist with EEG conducted in the outpatient setting.
- Present cases at the weekly Epilepsy Multidisciplinary Case Conference, including clinical data, multimodal imaging data, psychological, and VEEG data. Lead the initial clinical discussion of the findings and formulation of plans for ongoing care.
- Attend Wada testing when performed and interpret the EEG while observing the clinical performance of the testing by the neuropsychology and neurointerventional team.
- Assist in the interpretation and reporting of intracranial EEG recordings (grid, strip, and depth electrode cases).
- Attend and participate in Electrical Stimulation Mapping when performed in conjunction with the epilepsy, neurosurgical, and neuropsychology teams.
- Evaluate outpatients in tandem with the epilepsy attending. Obtain a careful and relevant history, perform a physical examination, review diagnostic data, interpret imaging, and present to the supervising attending in a clear and concise manner.
- Provide initial management recommendations (including further diagnostic testing, EEG studies, lifestyle changes, use of anticonvulsants, neurostimulator adjustments, surgical treatments, and other referrals) to the faculty member, then to the patient under supervision.
- Read sleep studies with a member of the sleep medicine faculty, review sleep studies and assist in generating reports.
- Obtain additional exposure to sleep medicine in the form of didactic lectures offered during our year-long Lecture series, and the optional Sleep Medicine Lectures and Case Conferences.
- Attend other regularly scheduled conferences and lectures during this rotation, including those related to EEG/epilepsy didactics, critical review of the scientific literature, research, and clinical care.
- Develop at least one research project and quality improvement measure throughout the year pertaining to EMU, CEeg, or clinic operations under the supervision and guidance of a faculty member.
- Conduct oneself in a compassionate, culturally sensitive and respectful manner.
- Dress with appropriate professional attire.
- Complete documentation on a timely basis, maintain a case log, and log duty hours.

**Rotation: Long Term Monitoring and Epilepsy Consultative Service**

**Description:** One month per rotation, four months per year (mandatory). The continuous EEG studies take place on the hospital wards or in the critical care units at NSUH and LIJMC. Studies are reviewed from the EEG Reading Room at NSUH. Epilepsy consultative services will be provided for patients admitted to NSUH. During their month long LTM rotation, fellows will be responsible for overseeing all inpatient long term bedside monitoring EEG studies outside of the EMU, and for rendering epilepsy consultations along with their supervising attending. Supervising faculty will evaluate each fellow quarterly (using the New Innovations website) as well as provide verbal feedback throughout the rotation.

**Rotation Goals:**

**Patient Care and Procedural Skills**
- Demonstrate compassionate care to patients with seizure related disorders, particularly in the context of other complex medical issues.
- Accurately diagnose seizure related disorders. Order and incorporate appropriate diagnostic testing.
- Recognize and manage status epilepticus.
- Recognize epilepsy related comorbidities, and coordinate with others to obtain appropriate care for the patient.
- Perform, review, and document EEG studies performed in the hospital and critical care settings.

**Medical Knowledge**
Recognize and discuss various seizure types and mimics with their associated semiology, underlying physiology, electrographic findings, and associations with various syndromes.

Discuss anticonvulsant selection, pharmokinetics, interactions, and side effects.

Recognize various EEG patterns associated with neurological comorbidities and other medical diseases.

Discuss the various presentations, underlying physiology, epidemiology, and literature regarding treatment options of status epilepticus.

Practice-based Learning and Improvement

Devise and implement quality improvement measures.

Incorporate didactics on best practices and evidence based scientific literature into patient care practice.

Interpersonal and Communication Skills

Present clinical cases and electrographic data to other physicians, patients, and families to assure the appropriate level of understanding.

Professionalism

Demonstrate behaviors of a respectful, timely efficient, compassionate and responsible clinician, including via direct patient care and documentation.

Systems-based Practice

In a professional environment, supervise a multidisciplinary care team, direct patient management, and educate other team members.

Objectives:

Oversee all inpatient long term bedside monitoring EEG studies outside of the EMU.

Review EEG data twice a day, or as required. Initiate a preliminary report draft, review pertinent findings with a faculty member, before finalizing the report.

Advise the primary care team about the EEG findings and provide management recommendations as required.

Assist technologists in solving technical issues and optimizing the quality of recordings. Assist in case review and EEG technologist education, including once monthly for an hour during the EEG Technologist Case Review Conference.

Assist technologists in triage of monitoring requests.

Render epilepsy consultations for other hospital services seeking assistance. Be the first point of contact for patients, obtain a complete and relevant history, perform a physical examination, and assist with documentation. Review cases together with the supervising faculty member.

Advise the referring team about EEG and clinical findings with management recommendations, particularly regarding those patients experiencing status epilepticus.

Attend other regularly scheduled conferences and lectures during this rotation, including those related to EEG/epilepsy didactics, critical review of the scientific literature, research, and clinical care.

Develop at least one research project and quality improvement measure throughout the year pertaining to EMU, CEEG, or clinic operations under the supervision and guidance of a faculty member.

Conduct oneself in a compassionate, culturally sensitive and respectful manner.

Dress with appropriate professional attire.

Complete documentation on a timely basis, maintain a case log, and log duty hours.
**Rotation: Pediatric Epilepsy**

**Description:** The rotation will take place at Cohen Children's Medical Center (CCMC) and will count towards the ACGME-mandated minimum of one month of exposure to pediatric epilepsy. The goals of the rotation include hands on experience with interpretation of routine, ambulatory and video EEG studies obtained on patients 0-18 years of age. Time will be split between the EEG reading room at CCMC in the morning, and outpatient office location in the afternoon. The fellow will be responsible for daily review and preliminary report generation for all patients undergoing long term video EEG monitoring on the epilepsy consult service. The EEG reports will then be reviewed and finalized with the assigned attending. The fellow will then round with the pediatric epilepsy attending and nurse practitioner on all patients on the epilepsy consult service. In the afternoon, the fellow will review all routine and ambulatory EEGs performed that day and generate preliminary reports. Studies will be reviewed with appropriate feedback from a supervising faculty member on a daily basis prior to finalizing reports. Fellows will attend the outpatient clinic with the pediatric neurology attendings at least one half day a week to gain experience with the outpatient management of pediatric patients with epilepsy. Supervising faculty will evaluate each fellow at the completion of the rotation using the New Innovations website.

**Rotation Goals:**

**Patient Care and Procedural Skills**
- Demonstrate compassionate care to pediatric patients with seizure related disorders.
- Accurately diagnose pediatric seizure related disorders. Order and incorporate appropriate diagnostic testing.
- Recognize epilepsy related comorbidities, and coordinate with others to obtain appropriate care for the patient.
- In the outpatient clinic setting, be exposed to the appropriate long term management of patients living with epilepsy.
- Become familiar with the use of neurostimulation methods for epilepsy.
- Perform, review, and document pediatric EEG studies both on an inpatient and outpatient basis.
- Perform, review, and document neonatal EEG studies.

**Medical Knowledge**
- Recognize, through exposure to diverse patients, various seizure types and mimics with their associated semiology, underlying physiology, epidemiology, genetics, electrographic findings, and associations with pediatric syndromes.
- Discuss anticonvulsant selection, pharmokinetics, interactions, and side effects specific to children.
- Discuss various neuroimaging findings and modalities relevant to epilepsy.
- Participate in and discuss presurgical planning.

**Practice-based Learning and Improvement**
- Incorporate didactics on best practices and evidence based scientific literature into patient care practice.

**Interpersonal and Communication Skills**
- Present clinical cases and electrographic data to other physicians, patients, and families to assure the appropriate level of understanding.

**Professionalism**
- Demonstrate behaviors of a respectful, timely efficient, compassionate and responsible clinician, including via direct patient care and documentation.
Systems-based Practice

- In a professional environment, supervise a multidisciplinary care team, direct patient management, and educate other team members.

Objectives:

- Review and generate preliminary reports for long term video EEG monitoring studies on all patients on epilepsy consult service.
- Make daily rounds with the pediatric epilepsy attending and nurse practitioner on the epilepsy consult service patients.
- Review and generate preliminary reports on daily routine and ambulatory EEG recordings.
- Review EEG studies and obtain feedback from a supervising faculty member prior to finalizing reports.
- Read and discuss with the supervising attending all neonatal EEGs as they become available to review.
- Communicate EEG findings and management recommendations to patients and to referring physicians.
- Assist technologists in solving technical issues and optimizing the quality of the recordings.
- Attend the weekly Wednesday morning pediatric neurology case conference/journal club. Present articles or cases during these conferences if requested, with assistance from supervising faculty in preparation.
- Attend pediatric epilepsy surgery conference on Thursday morning prior to adult epilepsy surgery conference.
- Evaluate outpatients in tandem with the pediatric neurology attendings at least half day clinic per week. Obtain a careful and relevant history, perform a physical examination, review diagnostic data, interpret imaging, and present to the supervising attending in a clear and concise manner.
- Attend the adult Seizure Clinic, Journal Club, and Epilepsy Multidisciplinary Case Conference at North Shore University Hospital.
- Conduct oneself in a compassionate, culturally sensitive and respectful manner.
- Dress with appropriate professional attire.
- Complete documentation on a timely basis, maintain a case log, and log duty hours.
- Complete an assessment comprising of multiple choice questions administered in the last week of the rotation.

Rotation: Outpatient Faculty Practice

Description: One month per rotation, one month per year (elective). The neurosciences outpatient offices are located adjacent to the primary site. There will be a rotating schedule of supervising attendings which have office hours primarily in the mornings, and those with hours typically in the afternoon. The fellow see outpatients with the supervising faculty member and will also assist in review of ambulatory EEG and outpatient routine EEG review. Supervising faculty will evaluate each fellow at the completion of the rotation using the New Innovations website.

Goals:
Patient Care and Procedural Skills
In the outpatient clinic setting, be exposed to a more in-depth experience with the long term management of patients living with epilepsy.

- Demonstrate compassionate care to patients with seizure related disorders
- Accurately diagnose seizure related disorders, including ordering and incorporating appropriate diagnostic testing.
- Recognize epilepsy related comorbidities and work with others to obtain appropriate multidisciplinary care for the patient.
- Perform, review, and document EEG studies performed on an ambulatory basis.

Medical Knowledge

- Recognize via emphasis on a careful clinical history and examination supplemented by EEG data the various seizure types and mimics with their associated semiology, underlying physiology, epidemiology, genetics, electrographic findings, and associations with various syndromes.
- Discuss anticonvulsant selection, pharmokinetics, interactions, and side effects.
- Discuss various neuroimaging findings and modalities relevant to epilepsy.
- Become familiar with the use of neurostimulation for epilepsy including VNS and RNS.

Practice-based Learning and Improvement

- Incorporate didactics on best practices and evidence based scientific literature into patient care practice.
- Analyze current and best practice, then devise and implement quality improvement measures.

Interpersonal and Communication Skills

- Present clinical cases and electrographic data to other physicians, patients, and families to assure the appropriate level of understanding.

Professionalism

- Demonstrate behaviors of a respectful, timely efficient, compassionate and responsible clinician, including via direct patient care and documentation

Systems-based Practice

- In a professional environment, supervise a multidisciplinary care team, direct patient management, and educate other team members.

Objectives:

- In seeing outpatients, obtain a careful and relevant history, perform an examination, review diagnostic data and imaging, then present in a clear and concise manner to the supervising attending.
- Efficiently interview the patient in an empathetic and sensitive manner.
- Elicit exam findings related to a potentially epileptogenic lesion.
- Provide initial recommendations for management (including further diagnostic testing, EEG studies, lifestyle changes, use of anticonvulsants, neurostimulator adjustments, surgical treatments, and other referrals) to the faculty member, then the patient.
- Discuss patient safety recommendations, lifestyle improvements, disease definitions and prognosis with the patients.
- Determine teratogenic risk, and to provide education in regards to prevention, when appropriate.
- Coordinate with nursing, social work, neuropsychology, and psychiatry to obtain the proper services required to deal with psychological or cognitive patient comorbidities or social concerns.
• Assist in interrogating and programming neurostimulation devices.
• Review outpatient routine and ambulatory EEG with the designated attending for the month. Review the study and generate an initial, then review and finalize with the attending, and obtain appropriate feedback.
• Conduct oneself in a compassionate, culturally sensitive and respectful manner.
• Dress with appropriate professional attire.
• Complete documentation on a timely basis, maintain a case log, and log duty hours.

**Rotation: Lenox Hill Hospital**

**Description:** One month per rotation, one month per year (elective). This is located at the main hospital in Manhattan. The fellow will meet attending staff at the Department of Neurology located on 8 Black Hall. There is an outpatient EEG laboratory located here. The majority of outpatient clinical visits occur here or in adjacent office space. The inpatient epilepsy monitoring unit (EMU) has 4 hardwired dedicated beds, located on 7 Wollman, an acute care inpatient ward for neurology and oncology. The EMU control room is equipped with two dedicated EEG reading stations with workspace for fellows and the nurse practitioner. The hospital has a large neonatal ICU and a smaller pediatric floor. There are separate conference rooms with audiovisual and teleconferencing capability.

Time will be split between reading EEG, seeing inpatient elective admissions, and epilepsy patient consultations in the mornings. Three afternoons a week, the fellow will evaluate and review outpatients with seizure-related disorders with the assigned epilepsy attendings. Cases of autoimmune or paraneoplastic antibody associated epilepsy and encephalitis will be of particular focus, and will be reviewed with Dr. Souhel Najjar in addition to other faculty members with similar interest and expertise. There is a biweekly epilepsy case conference, on Fridays at noon, and during fellow rotations a didactic teaching or journal club on the other alternating weeks. Supervising faculty will evaluate each fellow at the completion of the rotation using the New Innovations website.

**Goals:**

**Patient Care and Procedural Skills**
• In the outpatient clinic and EMU setting, be exposed to an additional in-depth experience with the management of patients living with epilepsy.
• Demonstrate compassionate care to patients with seizure related disorders
• Accurately diagnose seizure related disorders, including ordering and incorporating appropriate diagnostic testing.
• Accurately diagnose paraneoplastic or autoimmune disorders, order appropriate diagnostic testing.
• Discuss advanced treatments for paraneoplastic or autoimmune disorders.
• Recognize epilepsy related comorbidities and work with others to obtain appropriate care for the patient.
• Perform, review, and document EEG studies both on an inpatient and outpatient basis.

**Medical Knowledge**
• Recognize via emphasis on a careful clinical history and examination supplemented by EEG data the various seizure types and mimics with their associated semiology, underlying physiology, epidemiology, genetics, electrographic findings, and associations with various syndromes.
Recognize and discuss clinical, laboratory and neuropathological abnormalities associated with paraneoplastic and autoimmune syndromes.

Discuss anticonvulsant selection, pharmokinetics, interactions, and side effects.

Discuss various neuroimaging findings and modalities relevant to epilepsy and autoimmune syndromes.

Become familiar with the use of neurostimulation for epilepsy including VNS and RNS.

Practice-based Learning and Improvement

- Incorporate didactics on best practices and evidence based scientific literature into patient care practice.
- Analyze current and best practice, then devise and implement quality improvement measures.

Interpersonal and Communication Skills

- Present clinical cases and electrographic data to other physicians, patients, and families to assure the appropriate level of understanding.

Professionalism

- Demonstrate behaviors of a respectful, timely efficient, compassionate and responsible clinician, including via direct patient care and documentation.

Systems-based Practice

- In a professional environment, supervise a multidisciplinary care team, direct patient management, and educate other team members.

Objectives:

- In seeing outpatients, obtain a careful and relevant history, perform an examination, review diagnostic data and imaging, then present in a clear and concise manner to the supervising attending.
- Efficiently interview the patient in an empathetic and sensitive manner.
- Elicit exam findings related to a potentially epileptogenic lesion.
- Provide initial recommendations for management (including further diagnostic testing, EEG studies, lifestyle changes, use of anticonvulsants, neurostimulator adjustments, surgical treatments, and other referrals) to the faculty member, then the patient.
- Discuss patient safety recommendations, lifestyle improvements, disease definitions and prognosis with the patients.
- Determine teratogenic risk, and to provide education in regards to prevention, when appropriate.
- Review cases of autoimmune or paraneoplastic antibody associated encephalitis or epilepsy with faculty and discuss diagnostic and treatment recommendations.
- Coordinate with nursing, social work, neuropsychology, and psychiatry to obtain the proper services required to deal with psychological or cognitive patient comorbidities or social concerns.
- Assist in interrogating and programming neurostimulation devices.
- Review outpatient routine and ambulatory EEG with the designated attending for the month. Review the study and generate an initial, then review and finalize with the attending, and obtain appropriate feedback.
- Conduct oneself in a compassionate, culturally sensitive and respectful manner.
- Dress with appropriate professional attire.
- Complete documentation on a timely basis, maintain a case log, and log duty hours.