Lindsey Krawchuk, MD; Erica Johnson, MD, MS; Pola Chojecka, MD; Vyas Viswanathan, MD- ISP Application 03/13/2026

Project Lead/Key Contact

- *Lindsey Krawchuk, Project Lead*
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Why are you interested in the Improvement Scholars Program?

- Significant variation exists in how patients presenting with seizures and seizure-like activity are assessed, treated, and transferred, which creates significant challenges for both community providers and tertiary care centers. We are applying to the Improvement Scholars Program (ISP) to support a quality improvement initiative aimed at creating an evidence-based, scalable, multimodal clinical pathway for patients presenting to the emergency department with seizures or seizure-like activity to standardize the evaluation, assessment, and management of these patients in community emergency departments (ED) within the UNC Health system. It will consist of seizure workflows to guide management decisions and will additionally codify and improve access to existing resources by directly linking concurrent efforts across the UNC Department of Neurology to create standardized workflows for the management of status epilepticus and first-time seizures. Although implementation will begin alongside the UNC Teleneurology program, the pathway will be designed to support early evaluation and decision-making before neurology consultation or transfer requests are initiated. After it is fully put into operation, it will be available to all UNC Health system providers, including UNC Medical Center (UNCMC) and UNC Rex.
- The ISP would also provide us with the structure, mentorship, and education needed to successfully implement and evaluate a multi-site initiative. Additionally, the program would help support our professional development as emerging leaders in quality improvement. Our overall goal is to use the skills gained from this program to improve the access, consistency, and overall quality of care for every patient presenting with seizure-like activity across the state of North Carolina (NC).

Problem Statement: What is the problem you are looking to solve?

- Approximately 1 million people visit U.S. emergency departments every year with seizures or seizure-like activity[1], and seizures represent a substantial proportion of UNC Neurology transfer requests. Despite the frequency of this disease, only 21% of NC hospitals have an in-house neurologist[2], and more than half of acute care hospitals lack any direct access to neurology specialty services[3]. As a result, community ED providers are forced to make rapid decisions regarding diagnostic evaluation, treatment, and disposition without proper support. Given UNC Health system does not currently have a standardized seizure workflow, neurologists at tertiary care centers have noted considerable variation in seizure description, diagnostic workup, medication dosing, and triage decisions (i.e., admission, transfer, discharge, referral to rapid outpatient follow-up). This variation has inadvertently contributed to prolonged seizures and post-seizure drowsiness, as well as potentially avoidable escalations of care (i.e., intubation, ICU admission). These complications also contribute to the high volume of transfer requests received at tertiary care centers like UNC Medical Center (UNCMC) and UNC Rex. The downstream effects of these issues are increased demand for an already strained bed capacity system, potential delay in care for other patients with complex neurologic diseases, and an increased cost burden on patients and families. Our proposed evidence-based intervention, in the form of a clinical pathway, aims to standardize seizure care and decrease inefficiencies while also providing our community clinicians with the tools to continue caring for this vulnerable population.

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Importance Statement: Why is this project important?

- This project will address the larger problem of insufficient access to specialty neurology care while creating scalable models to support our colleagues in under-resourced areas, ultimately improving appropriate resource utilization, length of stay, and bed utilization. It will also help UNC Health system avoid potentially unnecessary admissions, transfers, hospital days, and hospital-acquired complications. Importantly, this effort will also foster interprofessional and interhospital collaboration, providing consistent high-quality care to seizure patients across the UNC Health system regardless of hospital location. Globally, lessons learned from this effort could inform future efforts to expand access to evidence-based practices across underserved areas in a broad variety of neurologic conditions.

Project Scope

In Scope:

- *What is the specific patient population your project will impact?*
  - This project will create a clinical management pathway targeting adult patients presenting with seizure or seizure-like activity to UNC Health system community emergency departments. During the pilot phase, it will be initiated at UNC Appalachian Hospital with the support of local providers and leaders, before expanding to 5-6 other UNC Health system hospitals, and eventually across the system.
  - While the project will launch alongside the UNC Teleneurology program, use of the pathway will not necessitate a teleneurology consult or even a transfer request. Rather, it is meant to be an early tool for providers to use prior to consultation. Additional educational programs and trainings will be rolled out prior to initiation of the pathway.
- *How many patients are in the population?*
  - The number of patients impacted by this project will vary by site. Combined, UNC Health system EDs treat approximately 800,000 to 1,000,000 patients per year. Since seizures represent approximately 1% of all ED visits nationally[1], it can be estimated that our project has the potential to impact 8,000 to 10,000 people per year, once fully implemented.
- *In what setting(s) would this problem be addressed? (e.g., hospital unit, outpatient practice setting, non-clinical setting, etc.)?*
  - Our project will be implemented using a phased approach, starting after the start of the UNC Teleneurology program at UNC Appalachian Hospital in the spring of 2026. After gathering appropriate feedback and making necessary adjustments to the pathway, Phase 2 will include expansion to 5-6 other UNC affiliate sites, before eventually standardizing seizure management in the ED across the UNC Health system. Additionally, the seizure transfer and outpatient follow up workflows created for this effort will be used to standardize the practices of UNCMC and UNC Rex providers while accepting transfer patients from EDs outside of the UNC Health system.

Out of Scope:

- Care outside the ED, including changes to EMS protocols, or the management of seizures after teleneurology consult or admission.
- The acquisition of additional resources for affiliate sites. Our project focuses only on helping providers use the resources they already have, while leveraging the new UNC Teleneurology program.
- Management of secondary medical conditions that are causing the seizures, such as antibiotic choice for meningitis, CIWA monitoring for alcohol withdrawal, or treatment of metabolic derangements

- Pediatric seizure management
- Large system infrastructure changes such as new major Epic builds, hospital transfer policies, or PLC bed allocation processes

Measures: (Process, Balancing, Structure)

Please describe the anticipated outcome measure(s), 2-3 process measures, and one balancing measure. Please do not include more than 5 measures total.

Measure Name	Measure Type	Measure Calculation	Measure Exclusion	Data Source	Baseline	Goal	Collection Frequency
Appropriate triage and management of patients with seizures/seizure-like events	Outcome	Number and percentage of patients receiving appropriately dosed ASMs prior to transfer. Number and percentage of patients appropriately triaged to ICU, intermediate or acute floor status after transfer	Patients not meeting diagnostic criteria for seizures or status epilepticus	EMR review and CCW records	Review of EMR data for 6 months prior to project start	At least a 20% increase in the associated measures.	Monthly
Pathway utilization	Process	Number and percentage of PLC calls following the proposed seizure management pathway, as documented in CCW notes Number and percentage of patients transferred from OSH meeting proposed transfer criteria	CCW calls/Transfer requests for indications other than seizure or seizure-like activity	Review of EMR and CCW records	Review of EMR data for 6 months prior to project start	>20% increase over the 1 year pilot period	Monthly

Transfer efficiency	Process	Duration of CCW transfer calls, as calculated by transfer request close date/time minus open date/time	CCW calls for indications other than seizure or seizure-like activity	Transfer request records and EMR review for transferred patients	Review of EMR data for 6 months prior to project start	No change or reduction in average duration of CCW transfer requests;	Biweekly audit
Patient safety events	Outcome& Balancing	Adverse patient events including rates of intubation for airway protection, CAUTIs, CLABSIs and new pressure ulcers	AEs present prior to admission	CCW transfer request records and EMR review for transferred patients	Review of CCW and EMR data for 6 months prior to project start	No change or reduction in # of adverse events	Monthly
Patient- and provider-centered outcomes	Other	Additional concerns identified by affiliate providers, patients and families through focus groups and key-informant interviews	This measure will only include factors identified by front-line providers, patients and families and not include measures proposed by providers/researchers	Quantitative analysis and coding of focus groups and key informant interviews	Focus groups and interviews will be conducted with key stakeholders, including patients and families in our epilepsy clinics and with front-line providers at teleneurology sites	To identify factors important to patients, families and providers at our partner sites and ensure that the proposed workflow meets the needs important to these key stakeholders	Baseline focus group at study start, with implementation of the intervention at each study site, then Q3-6 months depending on stakeholder availability

Root Cause Analysis

- *What do you think are the underlying causes of the problem?*
- *Why do you think the problem is happening?*
- The evaluation and initial management of seizures and seizure-like activity can vary across UNC Health system EDs, reflecting several system-level factors:
    1. Decreased access to neurology specialty care: Since most NC hospitals lack access to neurology specialists[3], and UNC Health system does not have a standardized seizure workflow, community ED providers are left with limited resources to manage a very complex issue. This often leads to inconsistent diagnostic workups, incomplete medical histories, limited seizure descriptions, and inconsistent administration of anti-seizure

medications. This lack of resources adds to the discomfort felt by local hospitalists in admitting these complex patients. This in turn leads to an increase in patients being transported to tertiary centers where families ultimately pay the price in the form of increased transportation, housing, and food costs.

2. High ED patient volumes and wait times: Increasing patient numbers in community ED waiting rooms and complaints about wait times can force providers to make premature disposition decisions after a seizure. Providers in resource poor areas receive limited or no guidance on appropriate observation periods or reassessment strategies and are incentivized to initiate transfer shortly after seizures resolve or after benzodiazepine administration. This is also likely rooted in the fact that it can take hours for transport to arrive, further pressuring ED providers to start the process early. These factors may lead to potentially avoidable transfers, patient hand-off gaps, and repeated labs and imaging.
3. Lack of standardized communication: Incomplete seizure description, medical histories, and diagnostic workup make it difficult for even in-house neurologists to determine if the event represents a serious acute provoked seizure (i.e., seizure due to meningitis), expected post-seizure drowsiness, sedation from excess medications, or an alternative diagnosis. A standardized seizure workflow would utilize a TeamSTEPPS tool, ultimately improving ED-consultant communication and ensuring the transfer of key clinical information.
4. Finally, no standardized seizure workflow: The absence of a shared clinical workflow means providers rely on their individual training, local practice patterns, and personal comfort for seizure management. These practice patterns often include automatic transfer to tertiary care centers like UNCMC and UNC Rex, even when toxic-metabolic factors are the likely cause, or the diagnosis of seizure itself is unclear. However, even if a facility has access to in-house neurology specialists or tele-neurology services, a standardized seizure workflow would help ED providers gather a more efficient and complete history and work-up which will also help them determine the best disposition for the patient sooner. This translates to a higher quality of care to patients, improved resource utilization, lower length of stay, and improved patient satisfaction.

Ideas for Improvement

- *What ideas do you have for changes that will result in improvement?*
- Our proposal includes the development of a standardized clinical pathway for the evaluation and management of seizures and seizure-like activity in emergency departments across UNC Health system affiliate sites. The pathway will include in-person and online education modules for front-line providers, access to online resources for seizure management, criteria for disposition, indications for EEG monitoring, and access to existing tools and order sets. This includes seizure resources already in development such as an Agile MD pathway for first-time seizures and an order set for status epilepticus. Our project will begin with a year-long pilot phase after the implementation of the UNC Teleneurology Consult Service at UNC Appalachian Hospital in spring 2026. This approach will allow us to gather feedback, identify challenges, and refine the workflow before expanding to an additional 5-6 UNC affiliate sites.
- The workflow will take the form of a simple, stepwise flowchart designed to guide providers from patient presentation through disposition options. Key components of the workflow will include:
    - Initial presentation and seizure characterization: The workflow will begin at the initial presentation and provide guidance on what key elements of the seizure description help identify seizure sub-types and distinguish seizures from muscle jerks or tremors. It will also

include a guide to help providers organize key information prior to calling for a teleneurology consults or transfer.
    - Standardized diagnostic evaluation: It will outline recommended initial laboratory testing and imaging studies.
    - Severity-based treatment guidance: We will collaborate with Drs. Clio Rubinos and Geetika Bajpai to provide guidance for initial treatment decisions based on clinical severity (discussed further in *Risks and Opportunities*). This section will also recommend appropriate reassessment intervals after seizure resolution or sedating medications like benzodiazepines and provide recommendations on the use of routine, continuous and rapid response EEG.
    - Disposition decision support: Finally, the workflow will guide clinicians in determining appropriate patient disposition from local admission with teleneurology consult, to discharge with outpatient follow-up, to transfer to tertiary care center.
- We plan to integrate this workflow into each site's preferred clinical platform (Agile MD or other local protocol repositories) to improve visibility and encourage regular use.
- In-person education sessions will be provided at each site prior to implementation where we can explain the workflow, answer questions, and gather feedback.
- Of course, we will first secure multidisciplinary collaboration between clinicians, staff and stakeholders at UNCMC, UNC Rex, and identify key champions from each affiliate site. These champions will include a multi-disciplinary group of clinicians and leaders that will be identified through the roll-out of the UNC Teleneurology program.

Risks and Opportunities

- *What factors do you anticipate will foster improvement?*
- *What are the major challenges you anticipate?*
- Several system-level factors will help support the successful implementation of the pathway:
    1. Alignment with the new UNC Teleneurology Service: By pairing increased neurology access with a standardized seizure workflow, community ED providers will have clear guidance on the initial assessment, diagnostic workup, and treatment of seizures prior to neurology consultation. This workflow will support an efficient consult by ensuring key clinical information is available, thereby facilitating clear communication, timely recommendations, and appropriate disposition decisions.
    2. Seizure presentation frequency: Seizure-like activity is one of the most common neurology consults in the U.S.[1], and it represents a significant proportion of transfer requests to UNC tertiary centers. Because seizures are encountered so frequently, a standardized workflow has the potential to positively affect a large number of NC patients. In addition, all of the project team members receive transfer requests for seizure-like activity, and Drs. Johnson and Chojecka will be staffing the UNC Teleneurology service. This provides a natural opportunity for the team to encourage use of the workflow and support its adoption among ED providers.
    3. Harmonization of existing clinical initiatives: We are collaborating with the leaders of other seizure projects to unite all of the available seizure resources under a shared pathway. Examples of collaboration include: 1) a seizure data collection tool developed by Drs. Lindsey Krawchuk and Claire Books that is used by neurology nurses at UNCMC to improve seizure descriptions, 2) a first-time seizure workflow created by Dr. Bajpai, 3) an Epic order

set created by Dr. Clio Rubinos, and 4) the expansion of an existing ED seizure workflow template created by Dr. Nikoloz Karazanashvili while he was a resident at UNCMC .

4. Content Experts and Departmental Support: This project benefits from the enthusiasm and support of multiple subject matter experts, including Dr. Suzette LaRoche (Vice Chair of Community Neurology), Dr. Lynn Liu (Division Chief Epilepsy), and Dr. Clio Rubinos (Director of the UNC Post Acute Seizure Clinic). Their involvement will help ensure the finalized workflow is evidence-based while also incorporating guidance for common yet concerning ED scenarios like prolonged-post-seizure drowsiness. Input from these experts will ensure the workflow aligns with current best practice standards.
5. Commitment to Education and Engagement: Implementation will include in-person affiliate site visits to introduce the workflow and answer questions. These sessions will provide an opportunity to build rapport with community team members and ensure the workflow is presented as a supportive resource. By sharing our neurology-specific training, we aim to streamline the care of seizures, helping to increase provider workflow efficiency while also supporting their efforts to deliver high quality care.

- We also anticipate several challenges during implementation:
    1. Provider practice variation: Workflow implementation will require engaging a large group of clinicians- including physicians, advanced practice providers, pharmacists, and nurses- who each bring diverse training backgrounds, clinical experiences, and established practice patterns. To address this, we will begin with a pilot phase at UNC Appalachian Hospital. This approach will allow us to gather feedback, identify challenges, and refine the workflow before expanding to an additional 5-6 UNC Health system sites.
    2. Variation in hospital resources: The resources available for seizure evaluation vary across UNC Health system sites. For example, UNCMC and Rex have access to 24/7 MRI and continuous video EEG, while other sites may have limited or no access to these resources. To address this, the workflow will be designed with flexibility in mind, allowing each site to complete the work-up to the extent they are able.
    3. Coordination and buy-in from multiple sites: Successful implementation will require strong communication between multiple sites and clinical teams. Providers throughout UNC share a commitment to providing high-quality care, but practice environments and workflows vary by site. Through collaboration, education, and engagement with site champions, we hope to create a practical workflow that clinicians will be motivated to use.
    4. Sustaining workflow integration over time: Clinical workflows and protocols are valuable practice tools, but they can lose utility if they are not integrated into the accepted resource platform at each individual site. To support long-term sustainability, there will be an in-person training at each new worksite, as well as interval refresher training. Furthermore, the workflow will be designed as a simple and adaptable tool that can be incorporated into whatever platform the site prefers (e.g., Epic Agile, Microsoft Teams, paper document, etc). This will improve the visibility of the workflow and help encourage long-term its use.

Stakeholders and Project Team Members

- *Who are the key project team leaders to design and implement change?*

Name	**Role**

Gwenn Garden, MD, PhD (Chair, Department of Neurology, Professor of Neurology at UNC Medical Center)	*Executive Sponsor*
Casey Olm-Shipman, MD, MS (Vice Chair of Quality Department of Neurology)	*Sponsor*
Lindsey Krawchuk, MD (Assistant Professor of Neurocritical Care at UNC Medical Center)	*UNC MC Co-Lead*
Erica Johnson, MD, MS (Assistant Professor of Neurology and Epilepsy at UNC Medical Center)	*UNC MC Co-Lead, Data Lead*
Pola A. Chojecka, MD (Medical Director of the Comprehensive Stroke Center at UNC Rex, Medical Director of Inpatient Neurology at UNC Rex, UNC Health Teleneurology Lead at UNC Rex, Adjunct Assistant Professor of Neurology at UNC, Vascular Neurologist & Neurohospitalist at UNC Rex)	*UNC Rex Co-Lead*
Vyas Viswanathan, MD (UNC Adjunct Assistant Professor and Neurointensivist at UNC Rex)	*UNC Rex Co-Lead*
Kayla Jensen, M2 (Clinician Leadership in Quality and Safety (CLQS) Scholar, UNC School of Medicine)	*UNC Medical Student*
Hudson McGinnis, DO (Medical Director of Inpatient Medicine at UNC Health Appalachian Hospital)	*UNC Health Appalachian Hospital Champion*
Suzette LaRoche, MD (Professor of Neurology and Epilepsy, Vice Chair of Community Partnership at UNC Medical Center)	*Advisor, Subject Matter Expert*
Lynn Liu, MD, MS (Professor of Neurology and Epilepsy, Division Chief Epilepsy, Medical Director of EEG Lab at UNC Medical Center)	*Advisor, Subject Matter Expert*
Clio Rubinos, MD, MS (Associate Professor of Neurocritical Care, Director of Post-Acute Symptomatic Seizure Clinic at UNC Medical Center)	*Advisor, Subject Matter Expert*
Geetika Bajpai MBBS, MD, DM (Assistant Professor of Neurology at UNC Medical Center)	*Advisor*
Daniel Roque, MD (Professor of Neurology, Vice Chair of Ambulatory Affairs at UNC Medical Center)	*Advisor*
Jorge Almodovar, MD (Professor of Neurology, Chief of General Neurology, Medical Director of UNC Hospitals Neurology Clinic)	*Advisor*
Key stakeholder interest groups will be established composed of front-line providers at affiliate sites, established patients with UNC Epilepsy Clinics as well as patients transferred to UNC for care of seizures.	*Key Stakeholder Interest Group*
Nikoloz Karazanashvili, MD (Assistant Professor of Neurology at UNC Health Caldwell)	*Clinical Workflow Advisor*

- *Who are the key stakeholders in your system and processes?*
- In addition to the project team leaders listed above, key stakeholders in this project include patients and loved ones affected by seizures and seizure-like events and hospital administrative staff who manage resource allocation and bed flow. It also includes the many healthcare providers who care for these patients, including physicians and advanced practitioners, nursing staff, social work/care management team members, ED pharmacists, and medical trainees. It is our intention to engage these key stakeholders through the creation of a multidisciplinary stakeholder group.

Impact on the Quintuple Aim

- *Improved health*
- *Enhanced patient experience*
- *Enhanced clinician and staff experience*
- *Health equity*
- *Reduced costs*
- This project aligns with the Quintuple Aim by improving the quality and consistency of care for patients presenting with seizure-like activity across the UNC Health system. Standardizing the initial evaluation and management of seizures in community ED's will promote improved health outcomes by ensuring that patients receive timely, evidence-based diagnostic workup, and appropriate treatment. The involvement of key stakeholder groups to guide project aims and outcomes will help ensure enhanced experience among patients, clinicians, and staff. A clear workflow and structured communication during teleneurology consultations will enhance the patient experience by reducing unnecessary delays, transfers, and avoidable escalations of care. A clear and structured workflow will support providers from a wide variety of locations, promoting health equity by ensuring patients receive a consistent seizure evaluation regardless of location. Additionally, increasing access to evidence-based resources for management of seizures and seizure-like activity will increase health equity by disseminating high standards of care across the UNC health system. Finally, reducing variation in testing, escalations in care, and unnecessary transfers has the potential to lower healthcare costs for both the health system and patients.

Sustainment Plan

1. *What ideas do you have for sustaining the improvement?*
2. *How do you see the work you start with IHQI's support continuing?*
3. We feel the best way to sustain the project is through the development of standardized care pathways that integrate, harmonize and build upon existent seizure tools and resources (some of which are already in Epic but have had poor uptake). Additionally, this initiative will hopefully improve the clinician experience by making it easier for frontline clinicians to do the right thing at the right place, improving efficiency and reducing individual provider burden. In-person education at the sites and promoting a culture of collaborative relationships and continued feedback from front-line users of the pathways and clinical staff, providers and administrators at the individual sites will also be critical for sustainment. Having key stakeholders participate in the project through the development of additional aims and providing regular feedback on implementation successes and challenges should support these aims. Another way to sustain it is to incorporate it into whatever platform used by each site. Having the workflow exist only in Epic Argile, for example, will not encourage use at a site who likes to post important protocols at each workstation. It will also be important to collect appropriate data, as stated in the Measures section, and use any feedback as a way to improve the protocol.

4. We feel that the flexibility of the proposed guide will further sustain its use. The transfer workflow and associated seizure transfer guide must be flexible and adapt to each site's available resources. For example, having a protocol that only mentions MRI imaging when many of the centers lack this particular imaging modality will only frustrate providers and make them less willing to use it. Our proposed multimodal guide is designed to be integrated into the workflow at each site and to present resources in multiple ways, including through in-person education, online videos and Epic/EMR integration.
5. We also feel that this project will be self-sustaining due to the breadth of the problem addressed[1] and due to the dedication of our team members. Each of us works with this patient population in our clinical roles, and we each will continue to have a personal vested interest in the continuation of the program.
6. Additionally, we are leveraging several existing and developing programs in the departments of Neurology, Neurocritical care and Epilepsy, including most notably, the creation and expansion of the UNC tele-neurology service. These programs and efforts will help to sustain the proposed intervention beyond the period of IHQI support.
7. It is our hope that this project will lay the foundation for a seizure management network to facilitate evidence-based practices across the UNC Hospital System.

Carolina Quality Tools

How will Carolina Quality tools (Just Culture, SAFE reporting, TeamSTEPPS, huddles, and visual management boards) be used to support the work? Although use of these tools is not required, applications including them will be strengthened.

- This project will leverage several Carolina Quality tools to support implementation, engagement, and continued use across participating sites. It promotes Just Culture by providing UNC Health system clinicians with evidence-based guidance for seizure workup and a direct line of support to neurology specialists. SAFE reporting will used to identify patterns and other unintended consequences reported by frontline staff. This information will allow us to identify and address the root cause of emerging issues. Our workflow uses TeamSTEPPS principles to improve communication between patients and providers from every site. The proposed seizure transfer guide specifically encourages a structured exchange of information between ED providers and teleneurology consultants, which will result in a higher quality of care. We will use unit huddles to introduce the workflow, provide education regarding key steps, and discuss recent cases. Finally, visual management boards will be used to display workflow metrics, progression toward goals, and feedback from community sites, helping to foster ongoing engagement between teams.

References

1. Sponsor letters – acknowledgement of support for this project:

March 2, 2026

Matt Huemmer, MBA, MHA, CLSSGB, CLSSBB
Senior Quality & Organizational Excellence Leader
Institute for Healthcare Quality Improvement
UNC School of Medicine
CB #8005
Chapel Hill, NC 27599

Lindsey Krawchuk, MD; Erica Johnson, MD, MS; Pola Chojecka, MD; Vyas Viswanathan, MD- ISP Application 03/13/2026

Re: Neurology Department support for Dr. Lindsey Krawchuk's IHQI Improvement Scholars Program (ISP) application:

Dear Mr. Huemmer,

It is with great enthusiasm that we express our strongest support for Dr. Lindsey Krawchuk's ISP proposal to standardize the assessment of seizure-like-activity in the emergency department at UNC Health Appalachian and optimize resource utilization and disposition for patients presenting with these signs and symptoms. Her project is co-led by neurologists at both UNC Medical Center and Rex; including Drs. Erica Johnson, Pola Chojecka, and Vyas Viswanathan. She has strong institutional support from Dr. Casey Olm-Shipman, our department's Vice Chair for Quality Improvement and an IHQI Core Team member; Dr. Suzette LaRoche, our Vice Chair for Community Partnerships; and the UNC Health Appalachian team.

Lindsey joined our faculty in the Division of Neurocritical Care in July 2025 as an assistant professor. She completed both her neurology residency and neurocritical care fellowship at UNC, during which she served respectively as Neurology Chief Resident and as Neurocritical Care Administrative Chief Fellow. In these roles, she demonstrated exceptional leadership, organizational skills, and a clear commitment to improving patient care and clinical systems.

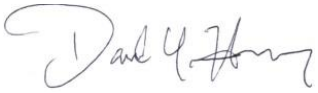
There are numerous concrete examples we could list of Lindsey taking leadership roles with the department to improve clinical operations and draw attention to quality improvement. Relevant to her IHQI proposal, as a trainee she worked with our epilepsy faculty to improve nursing descriptions of seizure semiologies. As Chief Resident, she made creative changes in the neurology residency schedule to improve support for our patients at night and authored an online residency handbook for our program in 2022. Of note, she recently published a first-author manuscript on ICU resource utilization for stroke patients in the journal *Neurocritical Care*. This project involved both stroke and neurocritical care faculty at UNC and will inform development of a risk-stratified step-down pathway for stroke patients. Her prior training in Lean Six Sigma and experience with Kaizen-based workflow redesign has helped her navigate each of these projects, among others.

Her proposed ISP project lays the foundation for addressing a critical gap in neurologic care across UNC Health. Seizure-like activity in community settings is often led by non-neurology providers who deliver attentive care but have variable training in recognizing seizures and seizure mimics. This variability can contribute to avoidable intubations, unnecessary transfers to tertiary care centers, and increased length of stay. Lindsey's plan to implement a standardized, evidence-based pathway at UNC Appalachian will support our frontline colleagues while improving resource utilization as well as the quality of care. The goal is that Lindsey's project at UNC Appalachian will then serve as a blueprint for expansion to other inpatient settings across UNC Health in future years. This plan supports the UNC Forward

Together 2030 strategy by strengthening our core operations, aligning service lines, improving ease of practice, and supporting systemwide capacity management.

Lindsey's track record, outstanding work ethic, and ability to engage a multidisciplinary group of providers, make her an ideal candidate to lead this project. Currently, Lindsey does not carry any additional formal administrative or educational leadership responsibilities in the Division of Neurocritical Care, and we are confident she will have the time needed to successfully conduct this project. We fully support her application and are confident her project will produce meaningful, system-level improvements in the care of the people of North Carolina, as well as develop her as a future leader at UNC in quality and safety.

Sincerely,



David Y. Hwang, MD, FAAN, FAHA, FCCM, FNCS
Professor and Chief, Division of Neurocritical Care, Department of Neurology

Gwenn A. Garden, MD, PhD
H. Houston Merritt Distinguished Professor and Chair, Department of Neurology

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March 10, 2026
Matt Huemmer, MBA, MHA, CLSSGB, CLSSBB
Senior Quality & Organizational Excellence Leader
Institute for Healthcare Quality Improvement
UNC School of Medicine
CB #8005
Chapel Hill, NC 27599
Re: Neurology Department support for Dr. Erica Johnson's IHQI Improvement Scholars Program (ISP) application
Dear Mr. Huemmer,
It is my pleasure to offer my strongest support for Dr. Erica Johnson's application to the IHQI Improvement Scholars Program (ISP). Dr. Johnson's proposal to standardize the assessment and management of seizure-like activity in the emergency department at UNC Health Appalachian addresses an important gap in neurologic care and represents a meaningful opportunity to improve both patient outcomes and resource utilization across the UNC Health system.

Lindsey Krawchuk, MD; Erica Johnson, MD, MS; Pola Chojecka, MD; Vyas Viswanathan, MD- ISP Application 03/13/2026

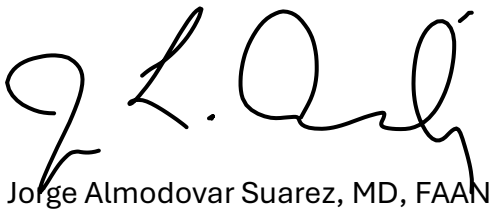
As a neurohospitalist with specialized training in EEG interpretation and seizure management, Dr. Johnson has extensive experience caring for patients hospitalized with seizures and seizure mimics. She has also received formal training in quality improvement methodology and has a strong interest in system-based approaches to improving neurologic care delivery. From this perspective, I believe Dr. Johnson's project is both timely and highly impactful. Seizure-like presentations in community emergency departments are often evaluated by non-neurology providers who provide excellent care but may have limited exposure to the full spectrum of seizure disorders. This variability can lead to unnecessary intubations, avoidable transfers to tertiary care centers, and increased healthcare utilization without clear benefit to patients.

Drs. Krawchuk and Johnson's proposal to implement a standardized, evidence-based evaluation pathway at UNC Health Appalachian will support frontline clinicians while promoting more consistent and efficient care. By improving diagnostic confidence and clarifying indications for transfer, this initiative has the potential to reduce unnecessary transfers while ensuring that patients who require tertiary-level neurologic care receive appropriate care in a timely manner. Importantly, the framework developed through this project could serve as a model for expansion to other community hospitals across UNC Health.

Dr. Johnson is exceptionally well prepared to lead this effort. She joined our faculty in the Division of Comprehensive Neurology in September 2025 as an Assistant Professor after completing neurology residency at the Mayo Clinic in Rochester, Minnesota, followed by fellowship training in Clinical Neurophysiology and ICU EEG at Yale University. She also earned a Master of Science in Clinical Research with a focus in health systems research and quality improvement. Through this training, she has developed a strong foundation in improvement science and demonstrated a clear commitment to advancing the quality and safety of neurologic care.

Beyond her formal training, Dr. Johnson has already demonstrated excellent leadership, organization, and collaborative skills. Her ability to engage multidisciplinary stakeholders—including emergency medicine, neurology, hospital medicine, and nursing—will be critical to the success of this project. I am confident she will effectively translate evidence into practical workflows that support clinicians and improve patient care.

Dr. Johnson currently does not hold additional formal administrative or educational leadership roles that would limit her ability to dedicate the necessary time and effort to this project. I fully support her application to the ISP and am confident that participation in this program will both strengthen the impact of her project and help develop her as a future leader in quality and safety within UNC Health.



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References:

1. Pallin DJ, Goldstein JN, Moussally JS, Pelletier AJ, Green AR, Camargo CA Jr. Seizure visits in US emergency departments: epidemiology and potential disparities in care. Int J Emerg Med. 2008 Jun;1(2):97-105. doi: 10.1007/s12245-008-0024-4. Epub 2008 Jun 5. PMID: 19384659; PMCID: PMC2657249.
2. Patel MD, Brown AB, Kebede ES. Statewide availability of acute stroke treatment, services, and programs: A survey of North Carolina Hospitals. J Stroke Cerebrovasc Dis. 2023 Oct;32(10):107323. doi: 10.1016/j.jstrokecerebrovasdis.2023.107323. Epub 2023 Aug 24. PMID: 37633205.
3. Patel MD, Honvoh G, Fernandez AR, Cadena R, Kelly ER, McDaniel P, Brice JH. Availability of Hospital Resources and Specialty Services for Stroke Care in North Carolina. South Med J. 2019 Jun;112(6):331-337. doi: 10.14423/SMJ.0000000000000986. PMID: 31158888; PMCID: PMC6640838.