



Seizure: First Non-Febrile Clinical Pathway Synopsis

Objective of Clinical Pathway

To provide care standards for infants or children presenting to the acute care setting for a first non-febrile seizure. The Seizure: First Non-Febrile Clinical Pathway provides guidance on recommended assessment and treatment to minimize variation in care.

Background

The first seizure is a life-changing event for families and caregivers that can have socioeconomic, cultural, and emotional impact (Nowacki & Jirsch, 2017; Sansevere et al., 2017). When an infant or child presents to the emergency department, urgent care center, or ambulatory clinic following a first seizure, the provider is tasked with determining whether the event was truly a seizure and then classifying the seizure type (Fisher et al., 2017). An accurate diagnosis and appropriate classification can be made through a thorough history and clinical examination, thereby informing management and prognosis (Fisher et al., 2017; Nowacki & Jirsch, 2017; Sansevere et al., 2017).

In the event of a first non-febrile seizure, the American Academy of Neurology (AAN) guidelines provide evidence-based recommendations for evaluating and treating patients aged 1 month to 21 years (Hirtz et al., 2000, 2003). While unchanged from the original publication, each set of guidelines was reaffirmed by the AAN. *Practice Parameter: Evaluating a First Nonfebrile Seizure in Children* (Hirtz et al., 2000) was reaffirmed on October 21, 2023 (AAN, 2023). *Practice Parameter: Treatment of the Child with a First Unprovoked Seizure* (Hirtz et al., 2003) was reaffirmed on September 18, 2021 (AAN, 2023). The guidelines aim to clarify indications for laboratory testing, diagnostic procedures, and treatment with antiepileptic medications following a first non-febrile, unprovoked seizure (Hirtz et al., 2000, 2003). General guidance, supported by supplemental research, suggests that laboratory testing or diagnostic procedures beyond a thorough history and clinical examination are not indicated (Hirtz et al., 2000; Lateef et al., 2008; Michelson et al., 2017; Strobel et al., 2015; Zuccarelli & Hall, 2016). However, an electroencephalogram (EEG) is advised for all infants and children following the first non-febrile seizure to be scheduled on a non-urgent basis to assist in determining seizure classification and predicting recurrence risk (Hirtz et al., 2000). The Seizure, First Non-Febrile Clinical Pathway guides healthcare providers caring for infants and children presenting for a first non-febrile seizure by providing evidence-based recommendations for assessment and treatment.

Target Users

- Physicians (Emergency Medicine, Urgent Care, Hospital Medicine, Fellows, Resident Physicians)
- Nurse Practitioners
- Nurses
- Pharmacy

Target Population

Exclusion Criteria

- < 90 days of age
- Unimmunized or under-immunized infant < 6 months of age
- Concurrent fever, refer to the [Febrile Seizure Clinical Pathway](#)
- Presenting in status epilepticus (seizure lasting longer than 5 minutes), refer to the [Status Epilepticus Initial Management Clinical Pathway](#)
- Concerns for epileptic, formerly infantile, spasms (*consult Neurology as soon as possible*)
- Significant central nervous system (CNS) event or surgical intervention within the past two weeks; if applicable, refer to the [Shunts \(Neurosurgical\): Infection and Malfunction Clinical Pathway](#)
- Recent history of head trauma

AGREE II

** These clinical pathways do not establish a standard of care to be followed in every case. It is recognized that each case is different, and those individuals involved in providing health care are expected to use their judgment in determining what is in the best interests of the patient based on the circumstances existing at the time. It is impossible to anticipate all possible situations that may exist and to prepare a clinical pathway for each. Accordingly, these clinical pathways should guide care with the understanding that departures from them may be required at times.*



Two American Academy of Neurology (AAN) national guidelines provided guidance to the Seizure: First Non-Febrile Clinical Pathway Committee (Hirtz et al., 2000, 2003). See Table 1 and Table 2 for AGREE II.

Table 1

AGREE II^a Summary for the AAN Evaluation Guideline (Hirtz et al., 2000)

Domain	Percent Agreement	Percent Justification [^]
Scope and purpose	97%	The aim of the guideline, the clinical questions posed and target populations were identified.
Stakeholder involvement	71%	The guideline was developed by the appropriate stakeholders, except for patients and/or their families, and represents the views of its intended users.
Rigor of development	61%	The process used to gather and synthesize the evidence were explicitly stated. The guideline developers did not provide how the recommendations were formulated nor how the guidelines will be updated.
Clarity and presentation	89%	The guideline recommendations are clear, unambiguous, and easily identified; in addition, different management options are presented.
Applicability	33%	The guideline did not address implementation barriers and facilitators, utilization strategies, nor resource costs associated with implementation.
Editorial independence	33%	It is unclear if the recommendations were biased by competing interests.
Overall guideline assessment	64%	
See Practice Recommendations		

Note: Four EBP Scholars completed the AGREE II on this guideline.

[^]Percentage justification is an interpretation based on the Children's Mercy EBP Department standards.

Table 2

AGREE II^a Summary for the AAN Treatment Guideline (Hirtz et al., 2003)

Domain	Percent Agreement	Percent Justification [^]
Scope and purpose	92%	The aim of the guideline, the clinical questions posed and target populations were identified.
Stakeholder involvement	74%	The guideline was developed by the appropriate stakeholders, except for patients and/or their families, and represents the views of its intended users.
Rigor of development	74%	The process used to gather and synthesize the evidence were explicitly stated. The guideline developers did not provide how the recommendations were formulated nor how the guidelines will be updated.
Clarity and presentation	92%	The guideline recommendations are clear, unambiguous, and easily identified; in addition, different management options are presented.
Applicability	38%	The guideline did not address implementation barriers and facilitators, utilization strategies, nor resource costs associated with implementation.
Editorial independence	33%	It is unclear if the recommendations were biased by competing interests.
Overall guideline assessment	67%	
See Practice Recommendations		

Note: Four EBP Scholars completed the AGREE II on this guideline.

[^]Percentage justification is an interpretation based on the Children's Mercy EBP Department standards.

Practice Recommendations

Please refer to the American Academy of Neurology (Hirtz et al., 2000, 2003) practice parameters for full evaluation and treatment recommendations.

Additional Questions Posed by the Clinical Pathway Committee

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No clinical questions beyond the scope of the parent guideline (Hirtz et al., 2000, 2003) were posed for formal literature review.

Updates from Previous Versions of the Clinical Pathway

- The previous version centered on evaluation occurring in the Emergency Department, whereas the updated Seizure: First Non-Febrile Clinical Pathway addresses the care process for any acute care setting
- The previous version considered a focal seizure to be outside the scope for guidance, whereas the updated Seizure: First Non-Febrile Clinical Pathway includes decision support for a focal seizure
- The updated version provides much more detailed guidance on rescue medications to prescribe for home use
- The updated version clarifies the logistics of obtaining an outpatient EEG and, if indicated, neuroimaging
- The previous version focused on anticipatory guidance through patient and family education before discharge, whereas the updated Seizure: First Non-Febrile Clinical Pathway includes information regarding rescue medications, discharge instructions specific to first non-febrile seizure, and provider education for first non-febrile seizure

Recommendation Specific for Children's Mercy

No deviations were made from the AAN practice parameters (Hirtz et al., 2000, 2003) regarding practice recommendations, but logistical processes specific to Children's Mercy were added.

- Placing the referral for non-urgent Neurology Clinic follow-up at the time of discharge
- Prescribing seizure rescue medication at time of discharge
- Ordering the EEG and non-urgent imaging (if indicated) at the Neurology Clinic appointment

Measures

- Utilization of the Seizure: First Non-Febrile Clinical Pathway
- Utilization of the Seizure: First Non-Febrile order sets
- Utilization of the Provider Education for First Non-Febrile Seizure (video resource)

Value Implications

The following improvements may increase value by reducing healthcare costs and non-monetary costs (e.g., missed school/work, loss of wages, stress) for patients and families and reducing costs and resource utilization for healthcare facilities.

- Decreased risk of unnecessary diagnostic interventions
- Decreased frequency of admission
- Decreased unwarranted variation in care
- Increased effectiveness of medical staff communication with patients and families

Organizational Barriers and Facilitators

Potential Barriers

- Variability of the acceptable level of risk among providers
- Challenges with follow-up faced by some families
- Wait time for subspecialty follow-up in some cases
- Inconsistencies in communication from medical staff to families regarding this diagnosis

Potential Facilitators

- Collaborative engagement across care continuum settings during clinical pathway development
- High rate of use of clinical pathways and order sets at this institution
- Updated and expanded patient/family education materials
- New educational video for medical staff on effective communication with patients and families about first, non-febrile seizures

Diversity/Equity/Inclusion

Our aim is to provide equitable care. These issues were discussed with the Committee, reviewed in the literature, and discussed prior to making any practice recommendations.

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Order Sets

- There are no associated order sets with the Seizure: First Non-Febrile Clinical Pathway

Education Materials

- [First Non-Febrile Seizure – Discharge Instructions](#)
 - Intended to be discussed and provided to the patient and family at the time of discharge
 - Found in Epic Education (PT EDU First Non-Febrile Seizure) process or the Seizure: First Non-Febrile Clinical Pathway website page
 - Available in English and [Spanish](#)
- Neurology Educational Videos for Patients and Families
 - Intended to share with patients and families following a first seizure
 - Provides a resource for learning about epilepsy and seizures, and how they can be treated and managed
 - Found when using the QR code provided on the First Non-Febrile Seizure – Discharge Instructions handout
 - Available in English and Spanish
- [Provider Education for First Non-Febrile Seizure](#) (video)
 - Intended to be an audiovisual resource for providers on discussing first non-febrile seizure with patients and families
 - Found through the hyperlink on the Seizure: First, Non-Febrile algorithm and the Seizure: First, Non-Febrile Clinical Pathway website

Clinical Pathway Preparation

The clinical pathway was prepared by the Evidence Based Practice (EBP) Department in collaboration with the Seizure, First Non-Febrile Clinical Pathway Committee, composed of content experts at Children's Mercy. If a conflict of interest is identified, the conflict will be disclosed next to the committee member's name.

Seizure, First Non-Febrile Clinical Pathway Committee Members and Representation

- Julie (Gianakon) Kostreva, MD | Pediatric Neurology Fellow | Committee Co-Chair
- Jean-Baptiste (J.B.) Le Pichon, MD, PhD, FAAP | Neurology | Committee Co-Chair
- Ara Hall, MD | Neurology | Committee Co-Chair
- James Hubbard, MD | Urgent Care | Committee Member
- Jonathan Ermer, MD | Pediatric Hospital Medicine Fellow | Committee Member
- Christine Scoby, DO | Hospital Medicine | Committee Member
- Amy D'Angelo, MD, FAAP | Emergency Medicine | Committee Chair/Member
- Audrey Kennedy, PharmD, BCPS, CPPS | Clinical Pharmacy Specialist, Neurology | Committee Member
- Jill Vickers, MSN, RN-BC, CPN | Clinical Practice and Quality | Committee Member
- Susana Chavez-Bueno, MD | Infectious Diseases | Contributor

Patient/Family Committee Member

- Allen Hall | Committee Member

EBP Committee Members

- Kathleen Berg, MD, FAAP | Hospitalist, Evidence Based Practice
- Kelli Ott, OTD, OTR/L | Evidence Based Practice

Clinical Pathway Development Funding

The development of this clinical pathway was underwritten by the following departments/divisions: Neurology, Urgent Care, Hospital Medicine, Emergency Medicine, Clinical Pharmacy, Clinical Practice and Quality, Patient and Family Engagement, Infectious Diseases, and Evidence Based Practice.

Conflict of Interest

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The contributors to the Seizure, First Non-Febrile Clinical Pathway have no conflicts of interest to disclose related to the subject matter or materials discussed.

Approval Process

- The clinical pathway was reviewed and approved by the Seizure, First Non-Febrile Clinical Pathway Committee, Content Expert Departments/Divisions, and the EBP Department; after which it was approved by the Medical Executive Committee.
- Clinical pathways are reviewed and updated as necessary every 3 years within the EBP Department at Children's Mercy. Content expert teams are involved with every review and update.

Review Requested

Department/Unit	Date Obtained
Neurology	January 2024
Urgent Care	January 2024
Hospital Medicine	January 2024
Emergency Medicine	January 2024
Clinical Pharmacy	January 2024
Clinical Practice and Quality	January 2024
Infectious Diseases	November 2023
Evidence Based Practice	January 2024

Version History

Date	Comments
June 2016	Version one – Developed clinical pathway algorithm and power plan
February 2024	Version two – Revised clinical pathway algorithm, associated EDP power plan, and associated Seizure Precautions (Pediatric) Clinical Skills – Patient Care Policy; developed Discharge Seizure Rescue Medication power plan, clinical pathway synopsis, discharge instructional handout
August 2024	Version three – Revised clinical pathway algorithm and clinical pathway synopsis to include the provider education for first non-febrile seizure 9video resource0 and hyperlink to the Status Epilepticus Initial Management Clinical Pathway
February 2026	Version four – Revised Seizure Rescue Medications by adding weight-based dosing for clonazepam to align with the revisions made to the order sets and removing the guidance pertaining to the "Height of Man" rule. The "Height of Man" rule information was removed due to a lack of clarity and limited supporting evidence
March 2026	Version five – Updated the clinical pathway algorithm to reflect that there are no associated order sets. Revised the Educational Materials section of the synopsis to identify the naming conventions used in Epic Education
May 2026	Version six – Added "recent history of head trauma" to the exclusion criteria and included a link to the Child Physical Abuse Clinical Pathway, where non-accidental trauma was mentioned

Date for Next Review

- February 2027

Implementation & Follow-Up

- Once approved, the pathway was presented to appropriate care teams and implemented. Care measurements will be assessed and shared with appropriate care teams to determine if changes need to occur
- Education tools were reviewed for health literacy

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- The associated policy was updated. This details the clinical skills process for nursing staff regarding seizure precautions. This policy will be submitted to the Nursing Practice Council Patient Care Policy Committee for approval
- Education was provided to all stakeholders:
 - Department of Emergency Medicine, Neurology, Urgent Care, and Hospital Medicine
- Additional institution-wide announcements were made via email, hospital website, and relevant huddles
- Metrics will be assessed and shared with appropriate care teams to determine if changes need to occur

Disclaimer

When evidence is lacking or inconclusive, options in care are provided in the supporting documents and the order set(s) and/or order panel(s) that accompany the clinical pathway.

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