First Unprovoked Seizure Clinical Pathway

Disclaimer

This clinical pathway is intended to provide general guidance and should not replace clinical judgment. It is meant to assist licensed practitioners and other health care providers in clinical decision-making by describing a range of generally acceptable approaches to the diagnosis and management of a particular condition. A particular patient's circumstances should always be taken into account when a practitioner is deciding on a course of management.This clinical pathway is current as of the date of publication and will be reviewed periodically to align with any updated best practices or evidence; however, new development may notbe represented in the published version. The treating practitioner assumes all risks associated with care decisions. Phoenix Children's accepts no liability for the content of this clinical pathway or the outcomes a patient might experience where a practitioner consulted the content of this clinical pathway.

Table of Contents

Pathway Flow Diagram/Algorithm

First Unprovoked Seizure Flow Diagram

Inclusion Criteria:

- A first unprovoked seizure
- Children > 1 month of age and ≤ 18 years of age

Exclusion Criteria:

- Children <28 days of age or <44 weeks gestational age
- Pre-existing epilepsy diagnosis
- Presence of intracranial hardware
- Recent history of head trauma
- Previous diagnosis or suspicion of CNS infection
- History or suspicion of brain tumor
- Other precipitating cause, including significant metabolic disturbances, oncologic processes, etc.
- Febrile Seizure – simple & complex
- Neurocutaneous disorders
- Non-epileptic event

START

History c/w first unprovoked (no illness, head trauma, electrolyte disturbance, hypertensive emergency, etc) seizure

Perform focused history and physical exam

- is this truly the first event ?
- is it concerning for a seizure (see text body below)?
- is history more consistent with non-epileptic event (esophageal reflux, orthostasis, convulsive syncope, non-epileptic event)?

Lab evaluation per clinical circumstances:

- Eg, diabetes, emesis/diarrhea, etc
- Toxicology screen if concern for ingestion
- LP of limited value in an afebrile, well appearing child

Head Imaging:

- Emergent MRI or 1-Bang MRI for persistent focal deficits or altered awareness or concern for intracranial process.
- Outpatient for well appearing patients

Does the patient have:

- Reassuring medical evaluation?
- Baseline mental status within 2 hours of seizure event?
- Seizure lasting less than 5 minutes that responded to two or fewer doses of benzodiazepine?
- Reliable PCP follow-up?

Yes

No

Patient to be discharged:

- Counsel about seizure first aid and safety education and provide websites to patient/family
- Provide prescription for rescue medication for repetitive seizures or if more than 3 minutes
- Arrange follow-up with PCP to obtain outpatient MRI
- Recommend next available neurology evaluation and provide neurology clinic phone number, notify case management; clinic scheduler to call family

Admit for further evaluation/coordination of care:

- Place EEG order
- If head imaging indicated, MRI brain w/o contrast is preferred study
- Neurology consultation

Discharge Criteria:

- Medical evaluation complete
- Baseline mental status
- Baseline physical examination
- Seizure first aid and safety education has been completed and handout provided to patient/family
- Rescue medication script provided and explanation of use completed
- Reliable follow-up in place with PCP
- Neurology clinic information provided to family with follow-up recommendation

Outpatient Rescue Medication Recommendations:

1. Clonazepam Disintegrating Oral Tab
   a. 0.125mg tab 4kg - 6kg
   b. 0.25mg tab >6kg - 12kg
   c. 0.5mg tab >12kg - 25kg
   d. 1mg tab >25kg - 50kg
   e. 2mg tab >50kg

Scope

- Definition:
  - Children with a first unprovoked seizure presenting to Phoenix Children's Hospital (PCH) or primary care provider (PCP).
- Inclusion Criteria:
  - A first unprovoked seizure or multiple seizures occurring within 24 hours of one another
  - Children > 1 month of age and ≤ 18 years of age
- Exclusion Criteria:
  - Children <28 days of age or <44 weeks gestational age
  - Pre-existing epilepsy diagnosis
  - Presence of intracranial hardware
  - Recent history of head trauma
  - Previous diagnosis or suspicion of CNS infection
  - History or suspicion of brain tumor
  - Other precipitating causes, such as significant metabolic disturbances, oncologic processes, etc.
  - Febrile Seizure – simple or complex
  - Neurocutaneous disorders
  - Suspected or known psychogenic non-epileptic events

.

Pathway Goals

1. Provide care in the correct setting: Primary Care Provider office vs Urgent Care vs Emergency Department vs Hospital vs Neurology Clinic
2. Improve value, decrease waste/cost
3. For patients presenting to the emergency department:
   a. Provide a consistent, evidence-based, diagnostic and therapeutic approach.
   b. Decrease hospitalization rate
4. For hospitalized patients:
   a. Provide a consistent, evidence-based diagnostic and therapeutic approach.
   b. Optimize length of stay
5. Standardize what different providers share with the patient and family regarding seizure education.
6. Decrease unnecessary referrals to the ED or for admission from PCP location.

Key Clinical Recommendations

1. Obtain a history to support the occurrence of an epileptic event (eg, behavioral arrest; inappropriate response to noxious stimulation; sustained head or eye deviation color change; and/or post-ictal behavior such as fatigue, headache, nausea, aphasia, lateralized weakness). Be mindful and consider seizure mimics (eg, syncope, breath-holding spells, reflux, confusional arousals, daydreaming, stereotypies, slow processing, conversion disorder).

2. Confirm there have not been prior, unprovoked seizures (eg, staring spells that could not be aborted with noxious stimulation, myoclonic seizures, or drop attacks). If so, then the patient has epilepsy and needs outpatient neurology referral.

3. Perform a focused examination, noting acute or chronic neurological deficits (altered mental status, aphasia, focal weakness, spasticity, etc.).

4. Laboratory tests are not indicated for seizures, unless clinical circumstances suggest a potential etiology for seizure (eg, ill-appearing, medical condition that places one at risk of seizures such as dialysis, or symptoms such vomiting, diarrhea)[1].

5. Admission or referral to the ED is not generally required for the evaluation of patients with a first-tiem unprovoked seizure, if the patient meets the discharge criteria below.

6. Anti-seizure medications (ASMs) are not generally indicated for a first-time, unprovoked seizure, because the likelihood of recurrence is usually < 50%. But rescue medication should be prescribed (see below).

7. Toxicology screening should be considered across the entire pediatric age range, if there is any question of drug exposure or substance abuse.[1]

8. In the child with a first, nonfebrile seizure, lumbar puncture is of limited value and should only be used, when there is concern for meningitis or encephalitis.[1]

9. EEG is recommended as part of the neurodiagnostic evaluation of the child with an apparent first unprovoked seizure to assess risk of recurrence. IT CANNOT confirm that the patient has experienced a seizure or provide an etiology.[1] HOWEVER, the EEG can generally be done safely as an outpatient and is not an indication for admission, UNLESS there is a concern for nonconvulsive status epilepticus. As interpretation of EEG findings can be complicated, this study is best ordered by a neurologist.

10. If a neuro-imaging study is obtained, MRI is the preferred modality (~5% of new epilepsy patients have brain tumors). If the patient has already had neuro-imaging and is at neurological baseline, then there is even less need for acute imaging, unless there are acute neurological deficits.[1]

11. Emergent neuro-imaging with CT or 1-bang MRI should be performed in a child of any age who exhibits a post-ictal focal deficit (Todd's paresis) or who has not returned to baseline within several hours after the seizure to evaluate for ischemic or hemorraghic stroke.[1]

12. Non-urgent imaging studies with an MRI (3 Tesla) should be seriously considered in any child with a significant cognitive or motor impairment of unknown etiology, unexplained abnormalities on neurologic examination, a seizure of focal onset with or without secondary generalization, or an infant. However, this is not an indication for admission. For those with benign epilepsy of childhood (eg, epilepsy with central-temporal spikes) or primary generalized epilepsy (eg, absence epilepsy), neuro-imaging is NOT recommended.[1]

13. For patients presenting to their PCP after a first unprovoked seizure or for those patients being seen in follow-up by their PCP after presenting to an ED, an MRI (if has not had one in the past) should be ordered while awaiting neurology evaluation. If the patient has a tumor, brain malformation, or evidence of prior injury, or if the patient has further seizures while awaiting neurology evaluation, please call the PCH neurology clinic for further guidance and to discuss more urgent follow-up.

Evidence Based Supporting Material

Each year, an estimated 25,000 to 40,000 children experience a first non-febrile seizure in the United States.[1] The American Academy of Neurology (AAN) has published practice parameters to assist with guiding the evaluation and treatment of these patients. This pathway outlines recommendations for the evaluation of patients experiencing a first unprovoked seizure in the community and hospital setting.

Unless meeting specific criteria outlined above, these patients do not require hospitalization or urgent neurology consultation. Essential to the treatment of these patients includes patient and family education regarding seizure first aid and safety. Rescue medication should also be provided to these patients.

The most recent practice parameter discussing evaluation of a first unprovoked seizure was published in 2000. More recent studies have been published questioning the need of EEG following a first unprovoked seizure.[2] This pathway recommends obtaining an EEG following a first unprovoked seizure as stated in the 2000 AAN guideline and expert opinion to assess risk of recurrence and possible seizure classification (it is not a tool to determine if someone has had a seizure). **EEG does not need to be performed at the time of initial presentation**. If the patient's neurological status is at baseline, EEG can be performed in the outpatient setting.

For those patients that can be safely discharged home and not requiring admission, it is recommended they be referred to a neurologist for outpatient consultation. While not everyone will experience a second unprovoked event, having an established relationship with a neurologist will be helpful to facilitate further treatment or evaluation needs.

Medication Recommendations for Outpatient Rescue Therapy

Medication	Route	Dose
ClonazePAM	Buccal	4-6 kg: 0.125 mg >6 kg – 12 kg: 0.25 mg >12 kg – 25 kg: 0.5 mg >25 kg – 50 kg: 1 mg >50 kg: 2 mg

Medication Recommendations for Inpatient Rescue Therapy

Medication	Route	Dose
ClonazePAM	Buccal	0.01-0.03 mg/kg/dose (Max dose = 2 mg)
DiazePAM	Intravenous	0.15-0.2 mg/kg/dose (Max dose = 10 mg)
LORazepam	Intravenous	0.1 mg/kg/dose (Max dose = 4 mg)
Midazolam	Intranasal	0.2 mg/kg/dose (Max dose = 10 mg)

Seizure Action Plan (SAP)

When prescribing a rescue medication, the provider should also create a Seizure Action Plan (similar to an Asthma Action Plan) to give the family a concrete plan to follow, as well to provide the school nurse a protocol and order to follow for a seizure.

How to create an SAP:

Select “Enter Document” in SCM.

Search for “OP-Seizure Action Plan Provider Note”

Under “Seizure Action Plan”, select “2-3 minutes” under the Yellow column and “> 3 minutes” under the Red column.

Under “Prolonged Seizure Medications” check the box next to the rescue medication provided

In the space provided, input the strength of the rescue medication

In the “Comments” section, add “also give for repetitive seizures”

Select the checkbox under “Healthcare Provider School Medication Authorization”.

Type in the provider’s name in the space provided

Admission Criteria

1. Children less than 28 days of age.
2. The patient has not returned to their neurological baseline within 2 hours of the seizure event.
3. Recurrent seizures.
4. Seizure lasting longer than 5 minutes that did not respond to two doses of benzodiazepine.
5. Patient does not have a primary care provider (PCP), and reasonable attempts to provide outpatient follow-up with a PCP cannot be confirmed.

Discharge Criteria

1. Returned to their neurological baseline.
2. Reliable follow-up in place with PCP.
3. Referral made to PCH neurology clinic for a first-time seizure appointment.
    a. If evaluated in the PCH Emergency Department or Urgent Care after hours, the phone number to the neurology clinic should be provided with instructions to call to make an appointment. Should a referral be necessary, give instructions to work with their PCP to obtain the referral.
4. A rescue medication has been prescribed, along with guidance on how to use it has been given.
5. Explicitly reviewed seizure first aid with family and shared this website (https://www.cdc.gov/epilepsy/first-aid-for-seizures/index.html) .
6. The family has been directed to appropriate information sources

a. https://www.epilepsy.com/sites/default/files/atoms/files/NewToSeizuresAndEpilepsy-March2021.pdf

b. https://epilepsysociety.org.uk/about-epilepsy/diagnosing-epilepsy/after-a-first-seizure is from the United Kingdom, so statements on the law and welfare benefits might not be applicable to the United States))

Patient and Family Education/Discharge Planning

1. Begin discharge education of patient/parents/family upon presentation to PCH facility.
    a. Seizure first aid and safety (obtain from Emily Center) discussed with patient and family and handout(s) provided.
    b. Rescue medication provided and instructions for use reviewed.
2. Involve case management and social work upon presentation to PCH facility if special needs exist that might delay discharge.
3. For hospitalized patients, education that:
    - the expected length of stay is 12-24 hours to confirm stability;
    - not to pursue further neurodiagnostic studies as an inpatient; and
    - the child will be discharged when they meet the discharge criteria.

.

References

1. Hirtz, D, MD., et al. Practice Parameter: Evaluating a First Nonfebrile Seizure in Children. American Academy of Neurology. 2000
2. Armon, K, MD., et al. An Evidence and Consensus Based Guideline of the Management of a Child After a Seizure. Emerg Med J 2003; 20: 13-30
3. Sharma, S, MD., et al. The Role of Emergent Neuroimaging in Children With New-Onset Afebrle Seizures. Pediatrics Vol 111 No. 1. 2003
4. Hirtz, D, MD., et al. Practice Parameter: Treatment of the Child with a First Unprovoked Seizure. American Academy of Neurology. 2003.

Pathway Champions

1. Guideline Champions: Dr. Korwyn Williams, Dr. Kelly Kelleher
2. Approved by Clinical Effectiveness Committee: 4/16/2026
3. Updated Literature Review and Revisions: https://www.epilepsy.com/tools-resources/forms-resources/epilepsy-toolkit (accessed 11/20/2024); https://epilepsysociety.org.uk/about-epilepsy/diagnosing-epilepsy/after-a-first-seizure (accessed 11/20/2024)