# Epilepsy Monitoring (Video EEG): Referral to Admit v3.1

Approval & Citation | Summary of Version Changes | Explanation of Evidence Ratings

**Inclusion Criteria**
- Patients referred to epilepsy monitoring unit (EMU) for diagnostic or presurgical evaluation

**Exclusion Criteria**
- Grid placement

**Recommended Admission Duration**

Seizure Frequency→ EMU days
- **Daily**→ 1-2 EMU days
- **Nearly every day with seizure free periods of <2 days**→ 3 EMU days
- **3-4 days a week**→ 5 EMU days
- For less frequent seizures - 7 EMU days
- For patients with Non-Epilepsy Seizures consider <48 hour study

**Internal referral for EMU placed**

**Referral type**

Pre-Surgical →

**Establish visit goals**
- MD completes Phase 1 checklist
- MD places procedure orders for video EEG 24hr Telemetry study (including need for sedation)

Diagnostic →

**External referral for EMU placed**
- Epi RN requests information from referring MD including visit goals
- Referring MD sends records
- Internal MD completes Phase 2 checklist, places orders, and screens for need for sedation

**Educate Family**
- Diagnostic: NEU MA sends family Inside Out link; once questionnaire is complete, NEU MA screens for need of sedation
- Pre-Surgical: Epi RN confirms orders & checklists. NEU MA sends family Inside Out Care link; once questionnaire is complete, NEU MA screens for need of sedation

All items complete

**Schedule and prepare for visit**
- Procedure Coordinator schedules EMU stay and sends family 'Tips & resources' link through Inside Out Care

**1 week prior to admission**
- Patient needs are reviewed at Epilepsy Triage and EMU Admission Plan Note completed
- NEU MA documents EMU Admission Plan Note in EMR and contacts family with any new instructions (medication withdrawal)
- Pre-Anesthesia Testing Coordination (PATC) team orders and schedules hospital-based COVID testing and contacts family

**72 hours prior to admission**
- COVID test result or a note for PATC team is documented

**Patient arrives for admit, is transported to room** → **Go to Inpatient Phase**

# Epilepsy Monitoring (Video EEG): Inpatient v3.1

Approval & Citation | Summary of Version Changes | Explanation of Evidence Ratings

**Seizure triggers**

**Inclusion Criteria**
- Patients referred to epilepsy monitoring unit (EMU) for diagnostic or presurgical evaluation

**Exclusion Criteria**
- Grid placement

## Admission

**Admission Orders** (Epilepsy Monitoring Unit (EMU) Admit Plan)
- Seizure precautions
- Casper for violent behavior
- Child Life consult
- Notify Dietitian if ketogenic diet
- Neuro Seizure Acute Care Plan

**RN Prepares for Admission**
- Prepares room using Epilepsy Monitoring Unit GOC (10388)
- Reviews EMU Admission Plan Note in EMR
- Reviews medication withdrawal in EMR

## EEG Lead Placement

If lice present on patient, refer to Isolation Table (10605) for necessary precautions (*for SCH only*)

**If Sedation**
- Sedation for video EEG hook-up
- Labs if needed
- Electrodes placed
  - Presurgical: special electrodes as specified in EMU Admission Plan Note
  - Order and place arm restraints (page provider if order needed) per Sedation job aid (12758) and Restraint policy (10939) (*for SCH only*)
- Transfer to recovery

**If No Sedation**
- Child Life
- Electrodes placed in treatment room
  - Presurgical: special electrodes as specified in EMU Admission Plan Note
  - Baseline EEG study if needed
- Place arm restraints, if ordered
- Patient/family escorted to room
- Failed Hookup Policy (13724) (*for SCH only*)

## Monitoring Begins/Admission Assessment

- Electrodes connected to acquisition machine & study started
- Patient/family receives education by EEG tech
- Patient/family receives education by RN
- EEG technologist assures EEG data quality
- Patient seen by APP / Epilepsy Fellow
- Examination findings presented to attending
- Team sees family
- Presurgical considerations:
  - IV placement
  - Bleeding history and lab studies (PT/INR, PTT)
  - Social work consult

## Daily Assessment

- When event occurs, conduct EMU Seizure Assessment and RN documents event in EMR
- EEG technologist assures EEG data quality
- APP / Epilepsy Fellow / Epileptologist examines patient and writes daily note
- Examination findings presented to attending
- Preliminary EEG results discussed among Team
- Team sees family
- Team review if goals of admission have been met
- Renew orders for arm restraints, if needed
- Report any falls or skin breakdown using eFeedback

Admit goals met or maximum number of scheduled days completed

Admit goals not met and longer study needed

Daily Review

**Discharge Criteria**
- Ensure data integrity/ quality
- Study discontinued (acquisition machine disconnected, electrodes removed)
- Scalp examined for skin breakdown
- Going Home Medication Plan initiated/resumed

## Continue Monitoring

- EEG tech initiates another 24-hour recording
- Team and family consider provocative maneuvers
- Adjust orders including medications if necessary

**Discharge Instructions**
- Activity restrictions if indicated
- After Your Child's Inpatient EEG Test – PE2020
- Follow-up appointment with referring provider, if needed
- Medication changes if indicated
- RN reviews discharge plan and lets patient know of follow-up call within 2 weeks

## Study Reviewed

- Communication of EEG critical values and results per Critical Tests and Critical Results policy (10323) (*for SCH only*)
- Report dictated or typed in template
- Report signed
- Copy sent to referring provider

## Post-Discharge Phone Call to Family

**Return to Referral to Admit**



Last Updated: December 2022
Next Expected Review: May 2023

# Recommended Length of Stay

*A systematic review of 32 mostly uncontrolled studies found that 75-96% of seizures in patients admitted for Psychogenic Non-Epileptic Seizures had events in the first 48 hours [Level of Evidence (LOE): Expert Opinion (Popkirov 2015)]*

*A consensus-based guideline from England and Wales recommended contacting parents or guardians 1-3 weeks prior to admission to confirm seizures and necessity of admission, and the following length of stay [Level of Evidence (LOE): Expert Opinion (Pressler 2017)]:*

| Seizure frequency | Video EEG monitoring |
|---|---|
| Daily | 1-2 days |
| Nearly daily with seizure free periods <2 days | 3 days |
| 3-4 days per week | 5 days |
| <4 per week or seizure free periods of >4 days | ASM reduction |

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# Medication Withdrawal

**Decision to withdraw medications:**

1. Reducing antiseizure medications (ASMs) after admission may be necessary.
2. The majority of patients will begin medication withdrawal after admission. For patients beginning medication withdrawal prior to hospitalization, the protocol needs to be determined and communicated prior to hospitalization.
3. When medications are prescribed by a primary epileptologist who is not at Seattle Children's, the SCH provider can contact the primary epileptologist to establish ASM withdrawal plan.
4. For communication: document the plan, counsel families on risks and effects of ASM withdrawal, inform nursing team.

**Withdrawal process:**

1. Choose which medication to withdraw based on patient history (medications, seizure history and frequency, travel distance).
2. Avoid withdrawing benzodiazepines or phenobarbital as this may provoke atypical seizures.
3. Withdraw ASMs with a short half-life. (Rationale: The effects of withdrawing medications with a longer half-life may not be seen during a short hospitalization).
4. For medications being withdrawn, give 50% of each dose, unless patient history necessitates a different individualized plan.
5. Insert IV for patients who have ASM withdrawal.
6. Give 1 or 2 doses of home ASMs prior to discharge.

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# Fall Definition

An unintended event resulting in a person coming to rest on the ground/floor or other lower level (witnessed), or is reported to have landed on the floor (unwitnessed), and is not related to the patient's stage of growth and development.

For more information see Fall Prevention Program in the Learning Center

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# Seizure Triggers

**Most people with seizures have triggers**

- Common Triggers
  - Sleep deprivation
  - Stress
  - Change in medication
  - Illness
  - Individual Triggers
- Telemetry EMU triggers
  - Sleep Deprivation (stay up late, get up early)
  - Bicycle
  - Medication wean
  - Individualize and negotiate with family

Expert opinion

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# Approval Citation

**Approved by the Epilepsy Monitoring Pathway Periodic Review team for May 24, 2018 go-live**

**CSW Epilepsy Monitoring Pathway Periodic Review Team:**

| | |
|---|---|
| **Neurology, Owner** | Christopher Beatty, MD |
| **Neurology, Stakeholder** | Edward Novotny, MD |
| **Neurology, Stakeholder** | Trylla Tuttle |
| **Neurology, Stakeholder** | Haley Sittner, PA-C |
| **Neurology, Stakeholder** | Molly Brown, MBA, BSN, RN, CPN, NE-BC |
| **Neurology, Stakeholder** | Vincent Chiu, MHA |
| **Neurology Diagnostics, Stakeholder** | Nicholas Allar |
| **Pharmacy, Stakeholder** | Meredith Manville |
| **Scheduling, Stakeholder** | Sarah Rodriguez |

**Clinical Effectiveness Team:**

| | |
|---|---|
| **Consultant** | Jennifer Hrachovec, PharmD, MPH |
| **Project Manager** | Dawn Hoffer, SAPM |
| **Clinical Nurse Specialist** | Angela Dixon, CNS |
| **CE Analyst** | Holly Clifton, MPH |
| **CIS Informatician** | Carlos Villavicencio, MD, MS/MI |
| **CIS Analyst** | Maria Jerome |
| **Librarian** | Sue Groshong, MLIS |
| **Program Coordinator** | Kristyn Simmons |

**Executive Approval:**

| | |
|---|---|
| **Sr. VP, Chief Medical Officer** | Mark Del Beccaro, MD |
| **Sr. VP, Chief Nursing Officer** | Madlyn Murrey, RN, MN |
| **Surgeon-in-Chief** | Bob Sawin, MD |

**Retrieval Website:** https://www.seattlechildrens.org/pdf/epilepsy-monitoring-pathway.pdf

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# Evidence Ratings

This pathway was developed through local consensus based on published evidence and expert opinion as part of Clinical Standard Work at Seattle Children's. Pathway teams include representatives from Medical, Subspecialty, and/or Surgical Services, Nursing, Pharmacy, Clinical Effectiveness, and other services as appropriate.

When possible, we used the GRADE method of rating evidence quality. Evidence is first assessed as to whether it is from randomized trial or cohort studies. The rating is then adjusted in the following manner (from: Guyatt G et al. J Clin Epidemiol. 2011;4:383-94.):

Quality ratings are *downgraded* if studies:

- Have serious limitations
- Have inconsistent results
- If evidence does not directly address clinical questions
- If estimates are imprecise OR
- If it is felt that there is substantial publication bias

Quality ratings are *upgraded* if it is felt that:

- The effect size is large
- If studies are designed in a way that confounding would likely underreport the magnitude of the effect OR
- If a dose-response gradient is evident

Guideline – Recommendation is from a published guideline that used methodology deemed acceptable by the team.

Expert Opinion – Our expert opinion is based on available evidence that does not meet GRADE criteria (for example, case-control studies).

**Quality of Evidence:**

✪✪✪✪ High quality
✪✪✪○ Moderate quality
✪✪○○ Low quality
✪○○○ Very low quality
Guideline
Expert Opinion

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# Summary of Version Changes

- **Version 1.0 (12/22/2012):** Go live. Epilepsy monitoring for patients with suspected epileptic encephalopathy.
- **Version 2.0 (7/11/2012):** Added diagnostic and presurgical epilepsy monitoring.
- **Version 2.1 (10/30/2013):** Reduced IV midazolam dosing.
- **Version 2.2 (9/30/2014):** Changed assessment for tolerance of EEG leads from Child Life to EEG Technologist. Added approval and citation pages.
- **Version 3.0 (5/24/2018):** Periodic review go live. Added preadmission process, standardized seizure medication wean, and added post-discharge communication.
- **Version 3.1 (12/12/2022):** Clarified MA actions to prepare for visit. Added PATC actions for COVID testing. Added note for lice present on patient. Changed terminology from “AED wean” to “ASM withdrawal.”

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# Medical Disclaimer

Medicine is an ever-changing science. As new research and clinical experience broaden our knowledge, changes in treatment and drug therapy are required.

The authors have checked with sources believed to be reliable in their efforts to provide information that is complete and generally in accord with the standards accepted at the time of publication.

However, in view of the possibility of human error or changes in medical sciences, neither the authors nor Seattle Children's Healthcare System nor any other party who has been involved in the preparation or publication of this work warrants that the information contained herein is in every respect accurate or complete, and they are not responsible for any errors or omissions or for the results obtained from the use of such information.

Readers should confirm the information contained herein with other sources and are encouraged to consult with their health care provider before making any health care decision.

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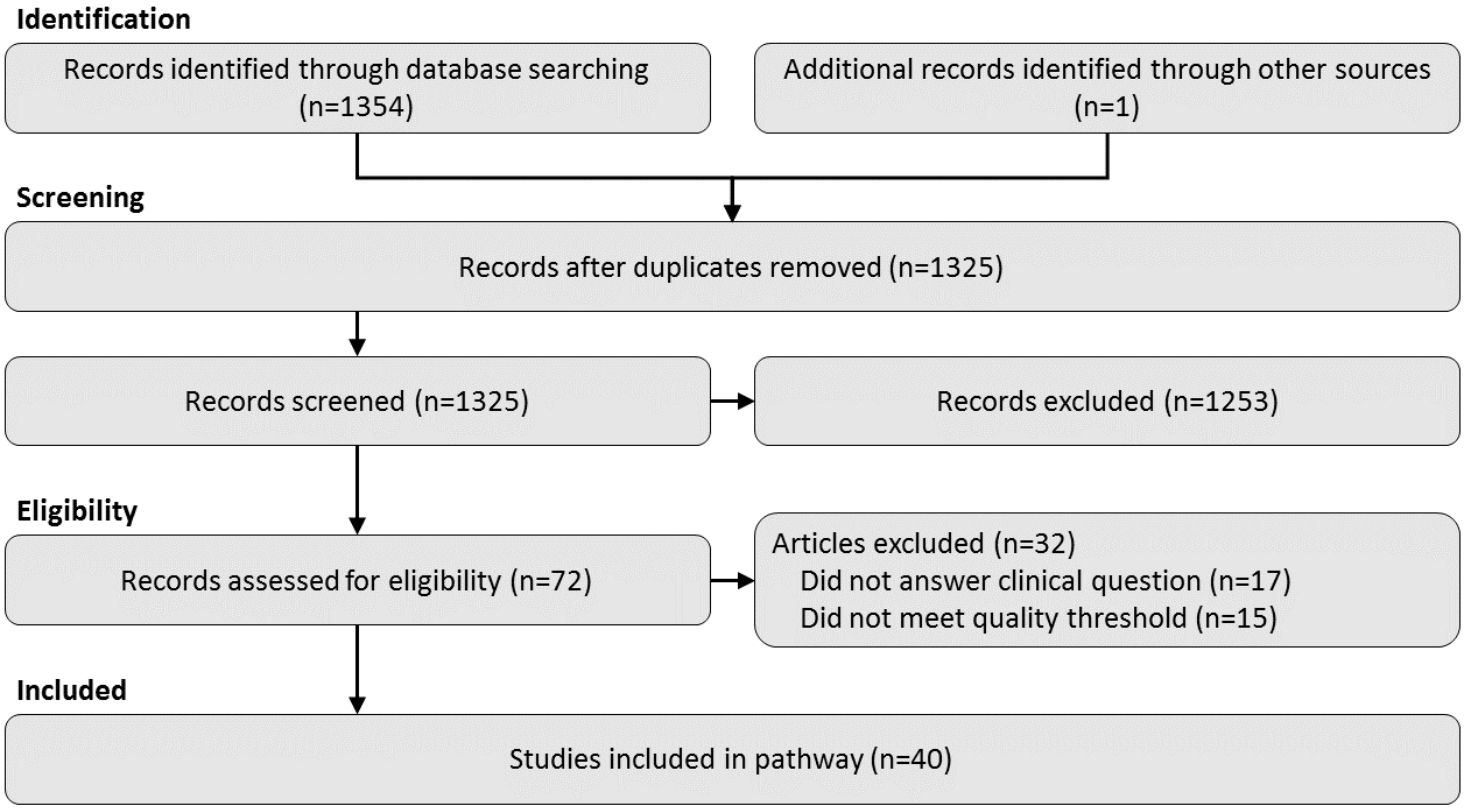
**Search Methods, Epilepsy Monitoring, Clinical Standard Work**

Studies were identified by searching electronic databases using search strategies developed and executed by a medical librarian, Susan Groshong. Searches were performed in December, 2017, in the following databases: Ovid Medline; Cochrane Library; Embase; National Guideline Clearinghouse; TRIP; and Cincinnati Children's Evidence-Based Recommendations. In Medline and Embase, appropriate Medical Subject Headings (MeSH) and Emtree headings were used respectively, along with text words, and the search strategy was adapted for other databases using text words. Concepts searched were epilepsy, electroencephalography, neurophysiological monitoring and seizure localization. Retrieval was limited to 2008 to current, humans, English language and to certain evidence categories, such as relevant publication types, index terms for study types and other similar limits. An additional article was identified by team members and added to results.

An additional search was conducted in January, 2018, in Ovid Medline and Embase. Concepts searched were epilepsy surgery, prognosis and outcomes. Retrieval was limited to 2008 to current, ages 0-18, English language and to certain evidence categories, such as relevant publication types, index terms for study types and other similar limits.




Flow diagram adapted from Moher D et al. BMJ 2009;339:bmj.b2535

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