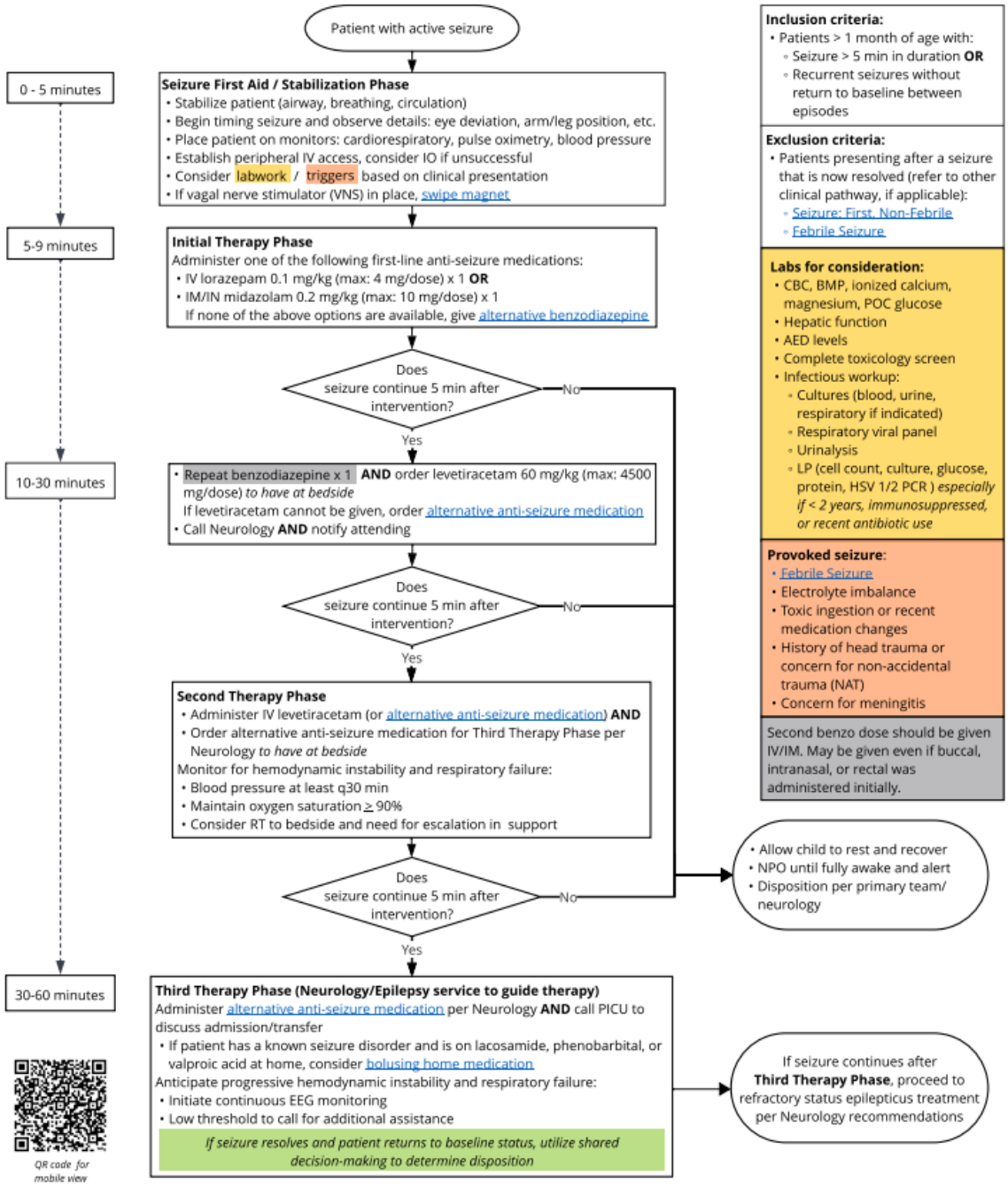
Status Epilepticus: Initial Management
Clinical Pathway Synopsis

Status Epilepticus: Initial Management Algorithm



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Objective of Clinical Pathway

The objective of the Status Epilepticus: Initial Management Clinical Pathway is to provide care standards for the initial management of a patient in status epilepticus (SE). This clinical pathway provides guidance for stabilization, medication administration, and escalation of care to support timely interventions and minimize variation across care settings.

Background/Epidemiology

Status epilepticus is considered a medical emergency and is defined as a prolonged seizure lasting longer than five minutes, or two or more sequential seizures without full recovery of consciousness between episodes (Glauser et al., 2016). The incidence of SE in children ranges from 10 to 58 per 100,000 per year for children aged 1 to 19 years to 156 per 100,000 per year for infants < 1 year of age (Freedman & Roach, 2023). Mortality in children is estimated to be less than 3.5% (Lu et al., 2020).

Treatment goals include rapid termination of both clinical and electrical seizure activity to prevent associated morbidity and mortality (Glauser et al., 2016; Neligan & Shorvon, 2011). Timely and appropriate medication administration is critical to the successful termination of seizure activity (Freedman & Roach, 2023) and minimization of adverse effects such as hypoventilation, hypotension, and cardiac rhythm disturbances (Glauser et al., 2016).

Target Users

- Physicians (Emergency Medicine, Hospital Medicine, Intensivists, Fellows, Resident Physicians)
- Nurse Practitioners
- Nurses
- Pharmacists

Target Population

Inclusion Criteria

- Patients > 1 month of age with:
  - Seizure lasting > 5 minutes in duration
    -**OR-**
  - Recurrent seizures without return to baseline between episodes

Exclusion Criteria

- Patients presenting after a seizure that is now resolved (refer to alternate Children's Mercy clinical pathway, if applicable):
  - Seizure: First, Non-Febrile
  - Febrile Seizure

AGREE II

The American Epilepsy Society (AES) Evidence Based Guideline: Treatment of Convulsive Status Epilepticus in Children and Adults provided guidance to the Status Epilepticus: Initial Management Clinical Pathway Committee (Glauser et al., 2016). See Table 1 for AGREE II.

Table 1
AGREE II[a] Summary for the AES Guideline (Glauser et al., 2016)

Domain	Percent Agreement	Percent Justification^
Scope and purpose	100%	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 and represents the views of its intended users.
Rigor of development	90%	The process used to gather and synthesize the evidence, and the methods to formulate the recommendations update the guidelines **were** explicitly stated.
Clarity and presentation	99%	The guideline recommendations **are** clear, unambiguous, and easily identified; in addition, different management options are presented.

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Applicability	73%	Barriers and facilitators to implementation, strategies to improve utilization, and resource implications **were addressed** in the guideline. The guideline **did not** address monitoring and/or auditing criteria for implementation.
Editorial independence	79%	The recommendations probably **were not** biased with competing interests. Funding source was not reported, but the AAN Clinical Practice Guideline Process Manual describes a rigorous process for identifying and disclosing conflicts of interest.
Overall guideline assessment	86%	
See Practice Recommendations		

Note: Six Evidence Based Practice (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 Epilepsy Society Evidence-Based Guideline (Glauser et al., 2016) for full practice recommendations, evaluation, and treatment recommendations.

Additional Questions Posed by the Clinical Pathway Committee

No additional clinical questions were posed for this review.

Recommendation Specific for Children's Mercy

Children's Mercy adopted the majority of the practice recommendations made by the AES Clinical Practice Guideline (Glauser et al., 2016). Variations include:

- Providers should begin second therapy phase at 10 minutes (instead of 20 minutes) and third therapy phase at 30 minutes (instead of 40 minutes)
- Valproic acid has been omitted from alternative anti-seizure agents and should only be given if patient is already receiving this at home OR with neurology approval

Measures

- Utilization of the Status Epilepticus: Initial Management Clinical Pathway
- Utilization of the Status Epilepticus power plans
- Time to administration of anti-seizure medications

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 time to administration of anti-seizure medications
- Decreased unwarranted variation in care

Organizational Barriers and Facilitators

Potential Barriers

- Variability of acceptable level of risk among providers
- Challenges with medication delivery and administration

Potential Facilitators

- Collaborative engagement across care continuum settings during clinical pathway development
- High rate of use of the clinical pathway
- Standardized order sets for Emergency Department, Pediatric Intensive Care, and Inpatient Care

Diversity/Equity/Inclusion

Our aim is to provide equitable care. These issues were discussed with the committee prior to making any practice recommendations.

Power Plans
- EDP Status Epilepticus
- PICU Status Epileptics
- Inpatient Status Epilepticus

Associated Policies
- Seizure Precautions (Pediatric) Clinical Skills – Patient Care Policy

Education Materials
- No education materials were developed as part of this pathway

Clinical Pathway Preparation

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

Status Epilepticus Clinical Pathway Committee Members and Representation
- Jessica Wallisch, MD | Critical Care Medicine | Committee Co-chair
- Ara Hall, MD | Neurology | Committee Co-chair
- Jacob Arends, MD | Neurology | Committee member
- Sarah Brunner, MD | Critical Care Medicine | Committee member
- Shelby Chesbro, MD | Pediatric Hospital Medicine Fellow | Committee member
- Blythe Duane, PharmD, BCPS | Clinical Pharmacist, PICU | Committee member
- Angela Etzenhouser, MD | Hospital Medicine | Committee member
- Marcie Files, MD | Neurology | Committee member
- Kathryn Jahnel, RN | Staff Nurse, 6 Henson | Committee member
- Audrey Kennedy, PharmD, BCPS, CPPS | Clinical Pharmacy Specialist, Neurology | Committee member
- Micala Kreighbaum, BSN, RN | Staff Nurse, 6 Henson | Committee member
- Maria Newmaster, MD | Pediatric Fellow | Committee member
- Sarah Nienhaus, BSN, RN, CPEN | Education Coordinator, Emergency Department | Committee member
- Natalie Perrin, BSN, RN, CCRN | Critical Care Medicine | Committee member
- Jay Rilinger, MD | Critical Care Medicine | Committee member
- Erin Scott, DO | Emergency Medicine | Committee member
- Noelle Tran, DO | Emergency Medicine and Child Abuse Fellow | Committee member
- Lines Vargas Collado, MD | Neurology | Committee member
- Jill Vickers, MSN, RN, NI-BC, CPN | Clinical Practice and Quality | Committee member
- Xuexin Lu, MD | Critical Care Fellow | Committee member

Patient/Family Committee Member
- Jeff Heinrich | Committee Member

EBP Committee Members
- Todd Glenski, MD, MSHA, FASA | Anesthesiology, Evidence Based Practice
- Kori Hess, PharmD | Evidence Based Practice

Clinical Pathway Development Funding

The development of this clinical pathway was underwritten by the following departments/divisions: Critical Care Medicine, Emergency Medicine, Hospital Medicine, Neurology, Pharmacy.

Conflict of Interest

The contributors to the Status Epilepticus: Initial Management Clinical Pathway have no conflicts of interest to disclose related to the subject matter or materials discussed.

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Approval Process

- This clinical pathway was reviewed and approved by the Status Epilepticus: Initial Management 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 CMKC. Content expert teams are involved with every review and update.

Review Requested

Department/Unit	Date Obtained
Critical Care Medicine	July 2024
Emergency Medicine	July 2024
Hospital Medicine	July 2024
Neurology	July 2024
Pharmacy	July 2024
Evidence Based Practice	July 2024

Version History

Date	Comments
July 2024	Version one – developed clinical pathway algorithm and synopsis, updated existing EDP and PICU Status Epilepticus power plans, developed new Inpatient Status Epilepticus power plan, revised Seizure Precautions (Pediatric) Clinical Skills – Patient Care Policy

Date for Next Review

- July 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.
- Order sets/power plans consistent with recommendations were created or updated for each care setting.
- The associated Seizure Precautions (Pediatric) Clinical Skills policy was updated for nursing staff. This policy will be submitted to the Nursing Practice Council Patient Care Policy Committee for approval.
- Education was provided to all stakeholders:
    - Nursing units where the clinical pathway is used (Emergency Department, Inpatient, Pediatric Intensive Care Unit)
    - Departments of Critical Care Medicine, Emergency Medicine, Hospital Medicine, Neurology, Pharmacy
- Additional institution-wide announcements were made via email, hospital website, and relevant huddles.

Disclaimer

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

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