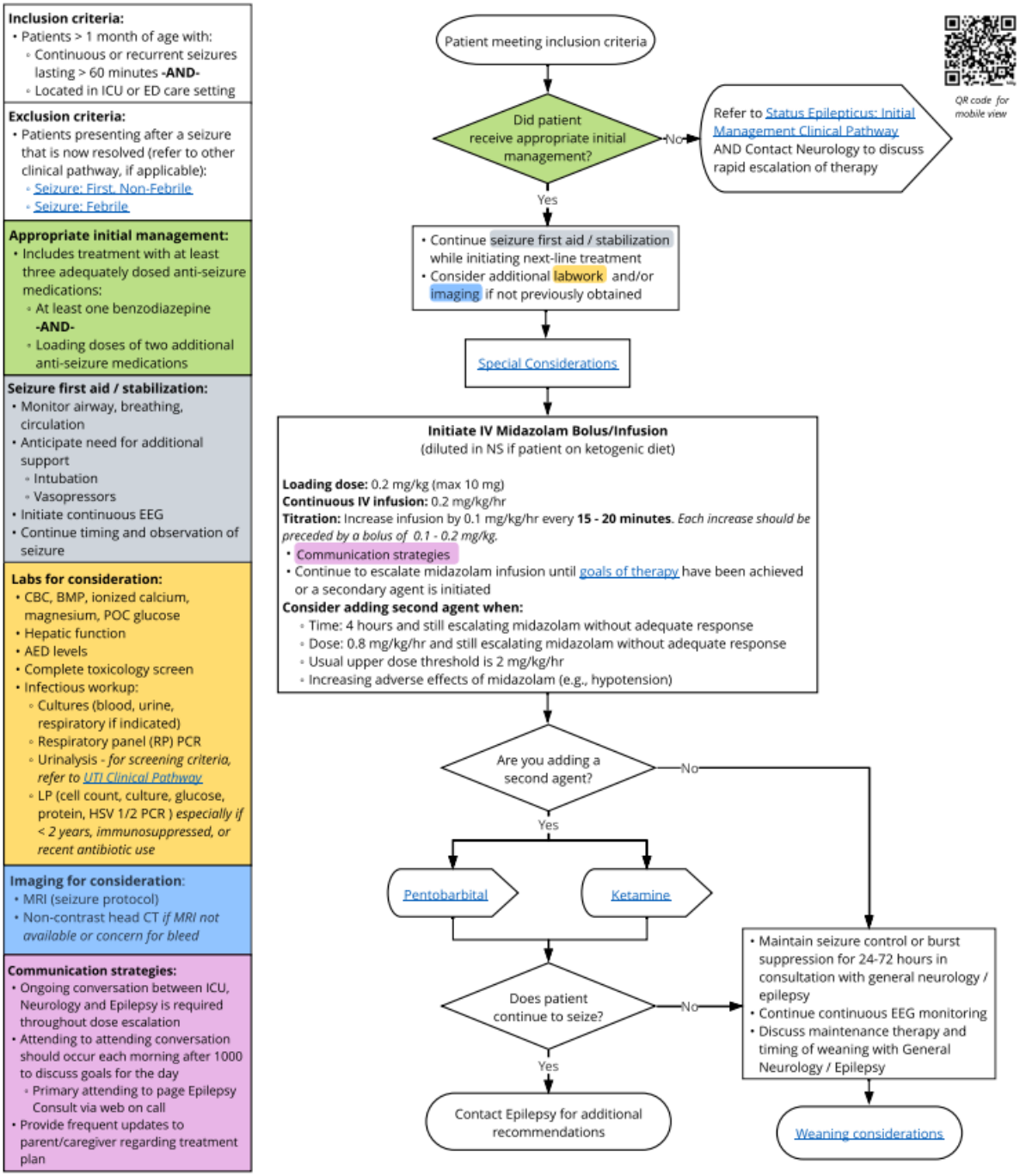
Status Epilepticus: Refractory Management
Clinical Pathway Synopsis

Status Epilepticus: Refractory Management Algorithm



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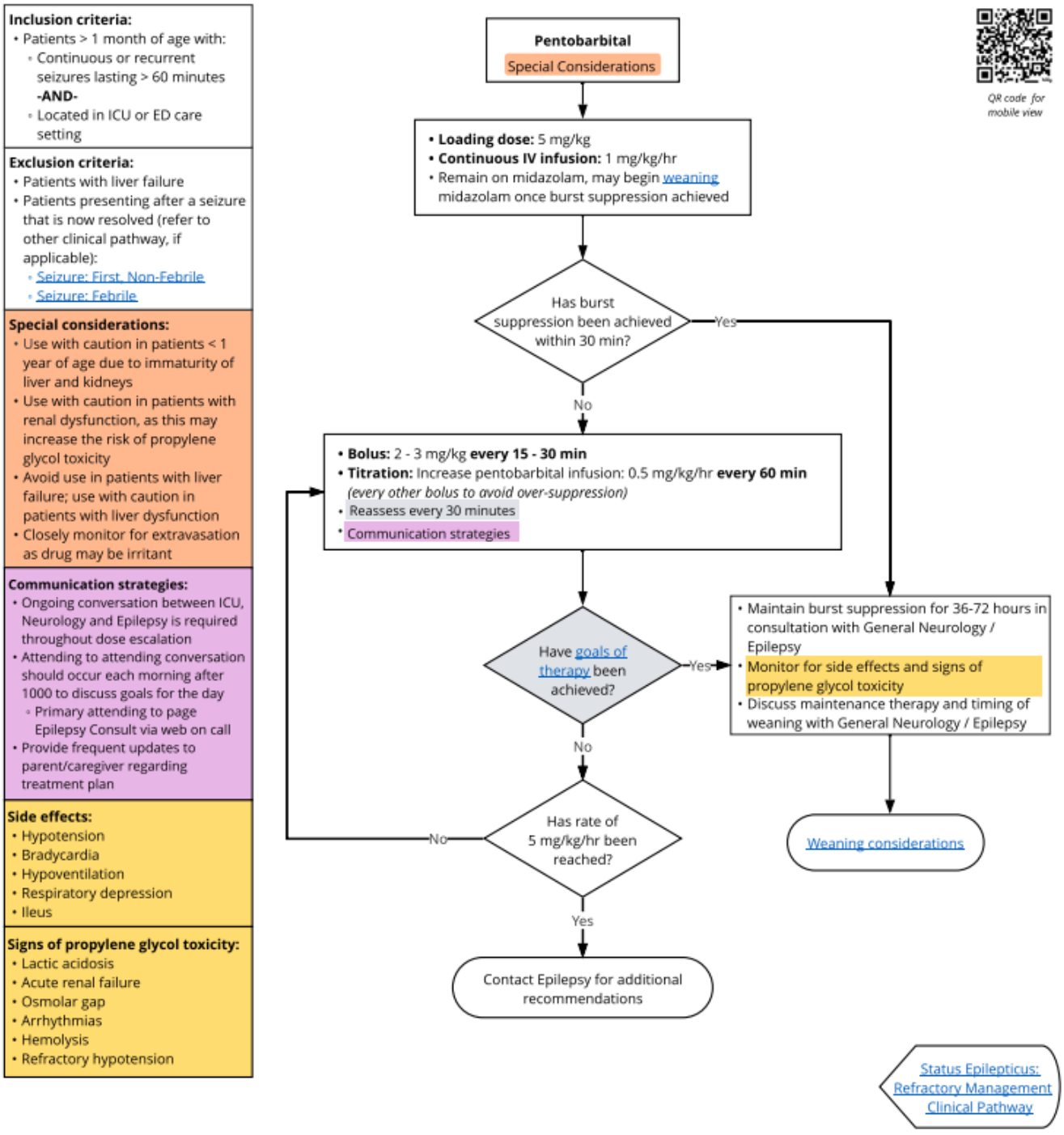
Status Epilepticus: Refractory Management Algorithm (Pentobarbital)



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Status Epilepticus: Refractory Management Algorithm (Ketamine)

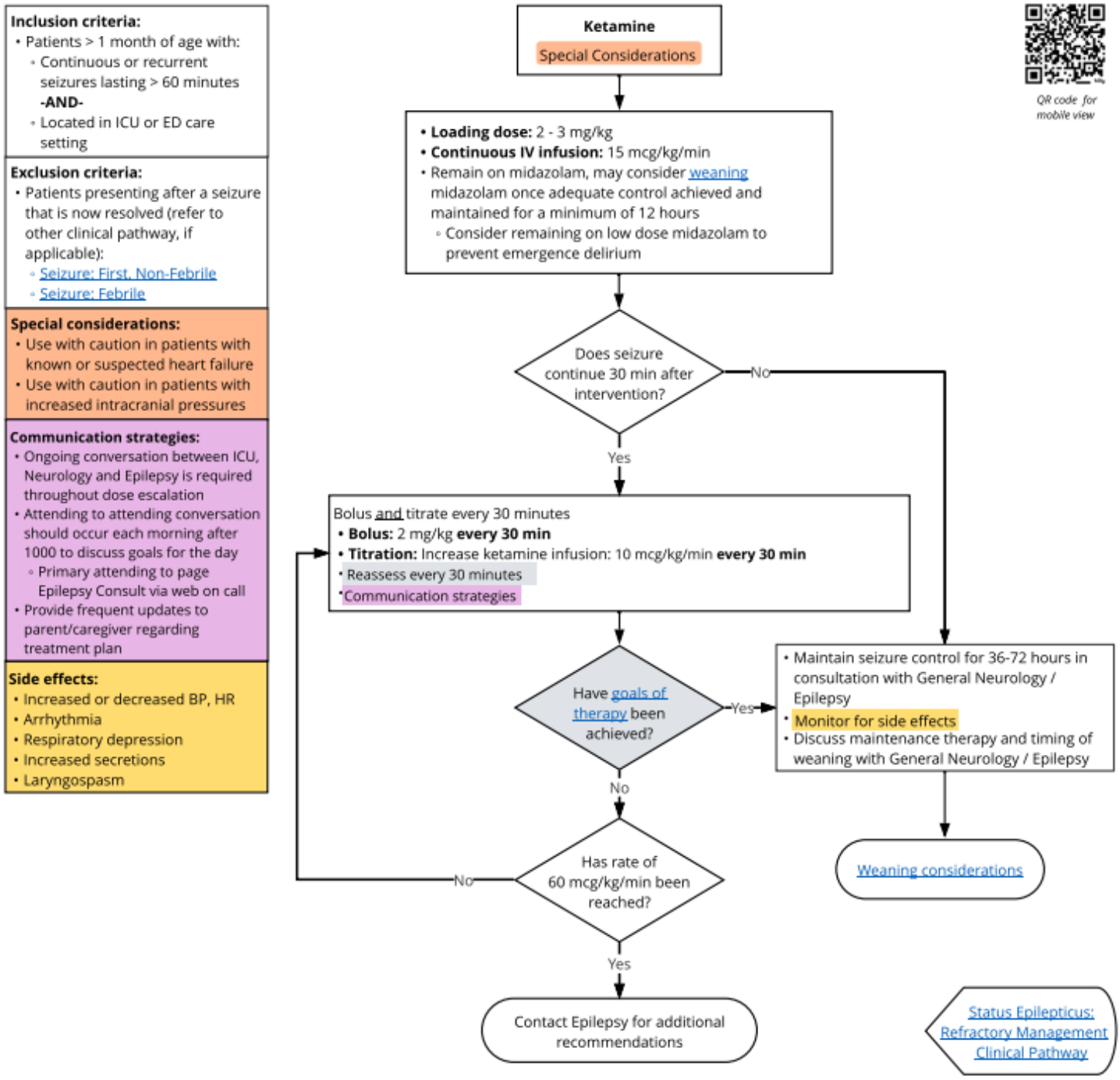

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Table of Contents

Objective of Clinical Pathway

The objective of the Status Epilepticus: Refractory Management Clinical Pathway is to provide guidance for the care of patients with seizure activity lasting greater than 60 minutes which is refractory to standard initial management. This clinical pathway provides recommendations for stabilization, lab work and imaging, medication administration, communication strategies, and escalation of therapy to support timely interventions and minimize unwarranted variation in care.

Background

Status epilepticus (SE) 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). Refractory Status Epilepticus (RSE) is the continuation of seizure activity (convulsive or nonconvulsive) despite appropriate initial management with at least two adequately dosed anti-seizure medications (Hepsø et al., 2024). Optimal medication therapy at the RSE stage is not well defined and depends on underlying etiology, the patient's response to therapy, and individualized treatment goals developed through shared decision-making. Treatment goals generally include rapid termination of both clinical and electrical seizure activity to prevent associated morbidity and mortality (Almohaish et al., 2024) and require timely and appropriate medication administration to reduce the risk of adverse outcomes.

Due to the complex and challenging nature of prolonged seizure management and the lack of high-quality evidence to guide therapy (Yan et al., 2024), this pathway was established to provide strategies for initiating and escalating continuous anesthetic infusions when initial interventions have failed. It emphasizes open communication between medical teams and caregivers and acknowledges that therapy must be tailored to each individual patient.

Target Users

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

Target Population

Inclusion Criteria

- Patients > 1 month of age with:
  - Continuous or recurrent seizures lasting > 60 minutes **-AND-**
  - Located in ICU or ED care setting

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
  - Seizure: Febrile

Practice Recommendations

A clinical practice guideline has not been established for the treatment of refractory status epilepticus in pediatric patients. Practice recommendations are based on the expert opinion of providers involved in the management of these patients along with limited published literature.

Additional Questions Posed by the Clinical Pathway Committee

No clinical questions were posed for this review.

Recommendations Specific for Children's Mercy

Practice recommendations, which were based primarily on expert consensus, include:

- When to initiate continuous intravenous medication therapy
- Initial medication options and dosing recommendations
- Monitoring and treatment goals specific to each medication

Measures
- Utilization of the Status Epilepticus: Refractory Management Clinical Pathway
- Utilization of the PICU Status Epilepticus power plan
- 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

Potential Facilitators
- Collaborative engagement across care continuum settings during clinical pathway development
- High rate of use of the clinical pathway

Power Plans
- PICU 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 Refractory 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
- Blythe Duane, PharmD, BCPS | Clinical Pharmacist, PICU | Committee member
- Yong Han, MD | Critical Care Medicine | Committee member
- Audrey Kennedy, PharmD, BCPS, CPPS | Clinical Pharmacy Specialist, Neurology | Committee member
- Xuexin Lu, MD | Critical Care 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
- Lines Vargas Collado, MD | Neurology | Committee member
- Jill Vickers, MSN, RN, NI-BC, CPN | Clinical Practice and Quality | Committee member

Patient/Family Committee Member
- Jeff Heinrich | Committee Member

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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, Evidence Based Practice, Neurology, Clinical Pharmacy, Clinical Practice and Quality.

Conflict of Interest

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

Approval Process

- This clinical pathway was reviewed and approved by the Status Epilepticus: Refractory 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	March 2025
Emergency Medicine	March 2025
Neurology	March 2025
Pharmacy	March 2025
Evidence Based Practice	March 2025

Version History

Date	Comments
March 2025	Version one – developed clinical pathway algorithm and synopsis, updated existing PICU Status Epilepticus power plan

Date for Next Review

- 2028

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 updated for the PICU
- Education was provided to all stakeholders:
  - Nursing units where the clinical pathway is used (Emergency Department, Pediatric Intensive Care Unit)
  - Departments of Critical Care Medicine, Emergency 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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