

## **Treating Emergency Department Seizure and Status Epilepticus Patients: Optimal Treatment Workshop**

### **Non-IV Parenteral AEDs**

1. List 5 anti-epileptic drugs (AEDs) that can be given intramuscular (IM) in an actively seizing patient.

1.
2.
3.
4.
5.

2. Name 3 ways in which midazolam can be given through a non-IV parenteral route.

1.
2.
3.

3. What is the most rapidly absorbed benzodiazepine when given through the intramuscular (IM) route?

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## Non-IV Parenteral AEDs

4. Which parenteral AEDs should not be given through the intramuscular (IM) route?

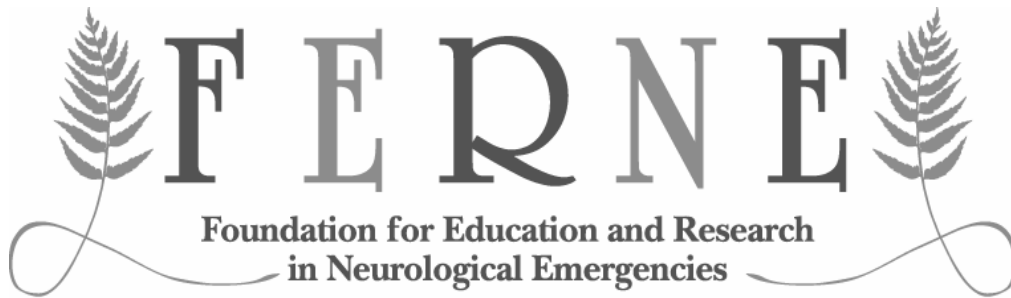
5. What benzodiazepine preparation can be given through the per rectum (PR) route?

6. What are the doses forms of the per rectum (PR) benzodiazepine preparations?

7. What AEDs can be given via an endotracheal tube (ETT)?

8. What AEDs can be given intraosseously (IO)?

9. Is there any rationale for AEDs to be given via an ETT or IO given other alternatives?



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### **Benzodiazepines**

1. When comparing diazepam and lorazepam, which of these drugs has the more rapid time of onset?

2. When comparing diazepam and lorazepam, which of these AEDs has the longer half-life and duration of action?

3. What are the advantages and disadvantages to the use of diazepam in the treatment of actively seizing patients in the ED?

## Benzodiazepines

4. What are the advantages and disadvantages to the use of lorazepam in the treatment of actively seizing patients in the ED?

5. If diazepam is used in the treatment of seizing patients in the emergency department, what is the requirement for subsequent AED administration in order to prevent recurrent seizures from occurring?

6. What is the maximal dosage of diazepam that should be delivered prior to declaring that this benzodiazepine was not effective in the management of an actively seizing patient?

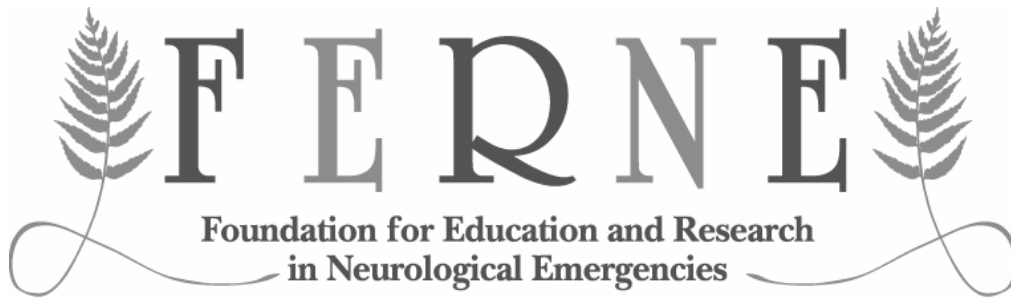
7. What is the maximal dosage of lorazepam that should be delivered prior to declaring that this benzodiazepine was not effective in the management of an actively seizing patient?

## Benzodiazepines

8. Which benzodiazepine is preferred in critically ill seizure and SE patients and why?

9. Which benzodiazepine is preferred in pediatric patients and why?

*Seizure Workshop Supported by Ortho-McNeil Neurologics, Inc.*



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### Phenytoins

1. What is the therapeutic range for the total phenytoin level, can this range be exceeded, and if so, why?

2. What is the maximal acceptable phenytoin dose and infusion rate in an actively seizing SE patient?

3. For every 1 mg/kg of a phenytoin infused, approximately how much does the total phenytoin level increase?

# Phenytoins

**4. What phenytoin rate was observed in the VA cooperative study of four AEDs patients in the treatment of SE patients?**

**5. What is the maximal infusion rate for fosphenytoin in SE patients?**

**6. Which therapy achieves a therapeutic free phenytoin faster: phenytoin at 50 mg/min or fosphenytoin at 150 mg/min, and at what time does this occur?**

**7. Is there a theoretical and/or proven outcome advantage to the use of fosphenytoin in the treatment of SE patients?**

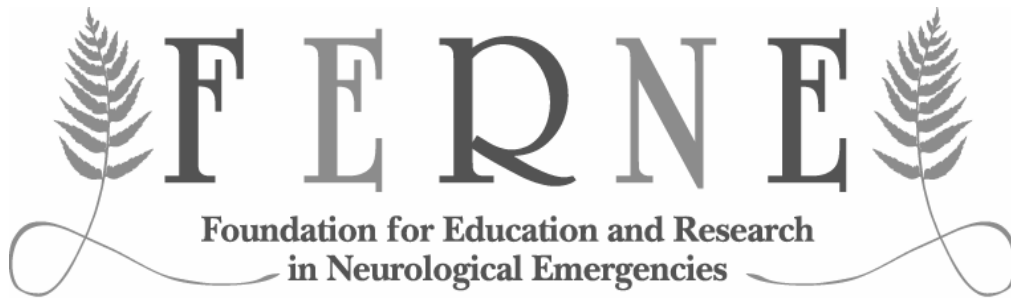
# Phenytoins

8. What is the maximum IM fosphenytoin volume that can be given in a single injection site, and how many mg of phenytoin can be provided with this maximal IM volume?

9. What are the requirements regarding obtaining a total phenytoin level following the use of IM or IV fosphenytoin, and why?

10. Are the pruritus and paresthesias that can occur when administering fosphenytoin a histamine mediated allergic reaction, and how should these symptoms be treated?

11. What is the most commonly observed important adverse effect when providing fosphenytoin at its maximal infusion rate, especially in older SE patients?



## Treating Emergency Department Seizure and Status Epilepticus Patients: Optimal Treatment Workshop

### Levetiracetam

1. What is the therapeutic range for the total levetiracetam level, and can this range be exceeded?

2. What is the maximal acceptable levetiracetam dose and infusion rate in an actively seizing SE patient?

3. For every 1 mg/kg of a levetiracetam infused, approximately how much does the total levetiracetam level increase?

4. How do the kinetics and bioavailability of IV levetiracetam compare to PO levetiracetam?

# Levetiracetam

5. If you wish to load a non-seizing ED patient with levetiracetam, what is the usual dose range?

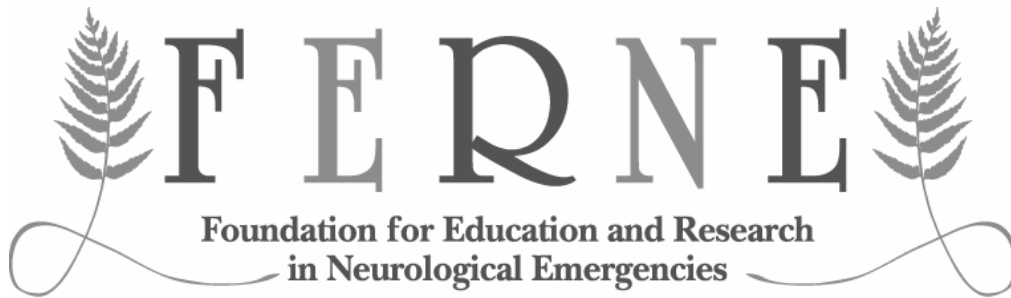
6. What is the usual levetiracetam daily starting dose in patients who have not taken this AED previously?

7. Since levetiracetam levels cannot commonly be obtained in clinical practice, how should adjustments in daily levetiracetam dosing be made in medication compliant break-through seizure patients?

8. How do the second generation AEDs compare to the first generation AEDs with regard to safety, efficacy, and tolerability?

9. In what patients might this AED be optimal, given its pharmacologic properties?

10. What are the commonly observed adverse effects that are observed with patients who are started on levetiracetam?



## Treating Emergency Department Seizure and Status Epilepticus Patients: Optimal Treatment Workshop

### Valproate

1. What is the therapeutic range for the valproate level, and can this range be exceeded?

2. What is the maximal acceptable valproate dose and infusion rate in an actively seizing SE patient?

3. For every 1 mg/kg of a valproate infused, approximately how much does the valproate level increase?

# Valproate

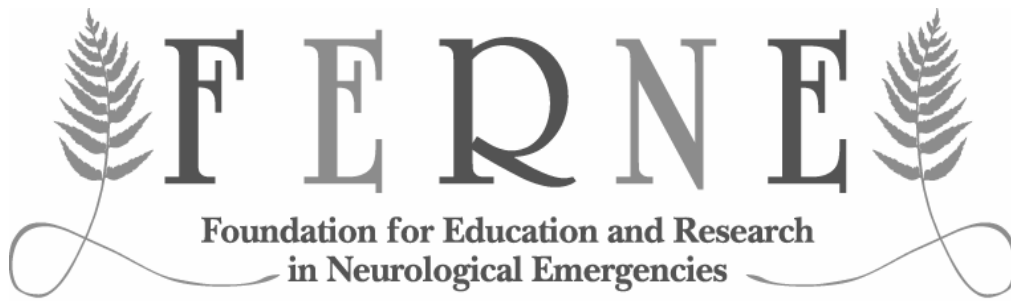
4. What are the common adverse effects observed when infusing IV valproate at this maximal rate in an SE patient?

5. If an actively seizing ED patient is thought to be compliant with PO Depakote and requires the administration of an IV valproate loading dose, can it be provided without first obtaining a serum valproate level? If so, how and why?

6. Should IV valproate be provided in an actively seizing patient who takes PO Depakote prior to administering a benzodiazepine or a phenytoin?

7. What is the common clinical presentation for Juvenile Myoclonic Epilepsy, and why is a valproate load perhaps optimal in ED seizure patients with this presumed diagnosis?

8. In what patients should IV valproate be avoided, and why?



## **Treating Emergency Department Seizure and Status Epilepticus Patients: Optimal Treatment Workshop**

### **Continuous Infusion AEDs**

1. **What are the advantages and disadvantages for the use of midazolam as a continuous infusion AED in the treatment of refractory SE patients?**

2. **How should midazolam be bolused, infused and titrated when treating actively seizing SE patients?**

3. **What are the advantages and disadvantages for the use of midazolam as a continuous infusion AED in the treatment of refractory SE patients?**

## Continuous Infusion AEDs

4. How should propofol be bolused, infused and titrated when treating actively seizing SE patients?

5. What are the advantages and disadvantages for the use of propofol as a continuous infusion AED in the treatment of refractory SE patients?

6. What are the complications of these AEDs continuous infusion AEDs when treating SE patients?

7. What is the recommendation of some epileptologists regarding the use of intermittent bolus and continuous infusion AEDs when treating actively seizing SE patients in the ED?

8. What recommendations are made regarding EEG monitoring in the treatment of actively seizing SE patient who requires a continuous AED infusion?