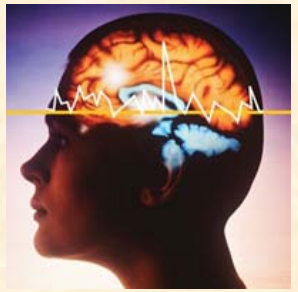
Neurocritical Care Society

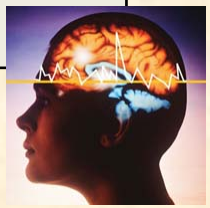
Guidelines for the Evaluation and Management Status Epilepticus



(Neurocritical Care 2012;17(1):3-23)

Definition SE

	Strong Recommendations
High or Moderate Quality Evidence	•SE defined as 5 min or more of continuous clinical and/or electrographic seizure activity or recurrent seizure activity without recovery between seizures •SE should be classified as either convulsive SE (convulsions that are associated with rhythmic jerking of the extremities) or non-convulsive SE (seizure activity seen on EEG without the clinical findings associated with convulsive SE) •Refractory SE should be defined as SE that does not respond to the standard treatment regimens, such as an initial benzodiazepine followed by another AED •The etiology of SE should be diagnosed and treated as soon as possible



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Status Epilepticus: Management Overview

Dx status epilepticus

Pre-hospital treatment

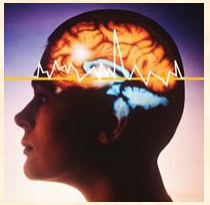
Emergent Initial Therapy

Urgent Control Therapy:
if convulsions continue

Urgent Control Therapy:
if convulsions stopped

Initial Rx of RSE

Advanced Rx of RSE



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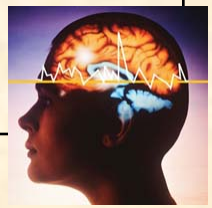
Approach: Diagnostic workup

All patients
• FS glucose
• Monitor vital signs.
• Head CT (appropriate for most cases)
• Labs: blood glucose, CBC, BMP, Ca, Mg
• cEEG monitoring
Consider based on clinical presentation
• Brain MRI
• Lumbar puncture
• Toxicology panel (i.e. isoniazid, TCAs, theophylline, cocaine, sympathomimetics, ETOH, organophosphates, cyclosporine)
• Other Labs: LFT, troponin, T&H, coags, ABG, AED levels, tox screen (urine/blood), inborn errors of metabolism



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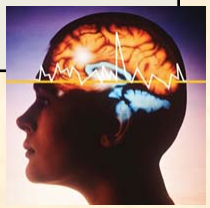
Treatment: General

	Strong Recommendations
High or Moderate Quality Evidence	•The treatment of convulsive SE should occur rapidly and continue sequentially until clinical seizures are halted •The treatment of SE should occur rapidly and continue sequentially until electrographic seizures are halted •Critical care treatment and monitoring should be started simultaneously with emergent initial therapy and continued until further therapy is consider successful or futile



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Treatment: Emergent initial therapy

	Strong Recommendations
High or Moderate Quality Evidence	•Benzodiazepines should be given as emergent initial therapy •Lorazepam is the drug of choice for IV administration •Midazolam is the drug of choice for IM administration •Rectal diazepam can be given when there is no IV access and IM administration of midazolam is contraindicated

Treatment: Urgent control therapy

	Strong Recommendations
High or Moderate Quality Evidence	•Urgent control AED therapy recommendations include use of IV fosphenytoin/phenytoin, valproate sodium, or levetiracetam

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Refractory Status Epilepticus

	Strong Recommendations	Weak Recommendations
Low or Poor Quality Evidence	•Refractory SE therapy recommendations should consist of continuous infusion AEDs, but vary by the patient's underlying condition •Dosing of continuous infusion AEDs for RSE should be titrated to cessation of electrographic seizures or burst suppression •During the transition from continuous infusion AEDs in RSE, it is suggested to use maintenance AEDs and monitor for recurrent seizures by cEEG during the titration period. If the patient is being treated for RSE at a facility without cEEG capabilities, consider transfer to a facility that can offer cEEG monitoring	•A period of 24–48 h of electrographic control is recommended prior to slow withdrawal of continuous infusion AEDs for RSE •Alternative therapies can be considered if cessation of seizures cannot be achieved; however, it is recommended to reserve these therapies for patients who do not respond to RSE AED treatment and consider transfer of the patient if they are not being managed by an ICU team that specialize in the treatment of SE and/or cannot provide cEEG monitoring

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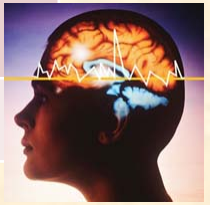
Treatment	Class/Level of evidence
Emergent treatment	
Lorazepam	Class I, level A
Midazolam	Class I, level A
Diazepam	Class IIa, level A
Phenytoin/fosphenytoin	Class IIb, level A
Phenobarbital	Class IIb, level A
Valproate sodium	Class IIb, level A
Levetiracetam	Class IIb, level C
Urgent treatment	
Valproate sodium	Class IIa, level A
Phenytoin/fosphenytoin	Class IIa, level B
Midazolam (continuous infusion)	Class IIb, level B
Phenobarbital	Class IIb, level C
Levetiracetam	Class IIb, level C



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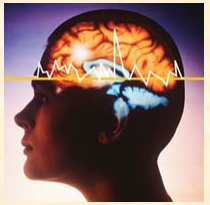
Treatment	Class/Level of evidence
Refractory treatment	
Midazolam	Class IIa, level B
Propofol	Class IIb, level B
Pentobarbital/thiopental	Class IIb, level B
Valproate sodium	Class IIa, level B
Levetiracetam	Class IIb, level C
Phenytoin/fosphenytoin	Class IIb, level C
Lacosamide	Class IIb, level C
Topiramate	Class IIb, level C
Phenobarbital	Class IIb, level C



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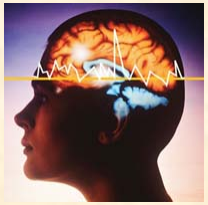
Continuous EEG Monitoring

	Strong Recommendations
Low or Poor Quality Evidence	•The use of cEEG is usually required for the treatment of SE •Continuous EEG monitoring should be initiated within 1 h of SE onset if ongoing seizures are suspected •The duration of cEEG monitoring should be at least 48 h in comatose patients to evaluate for non-convulsive seizures (strong recommendation, low quality). •The person reading EEG in the ICU setting should have specialized training in cEEG interpretation, including the ability to analyze raw EEG as well as quantitative EEG tracings



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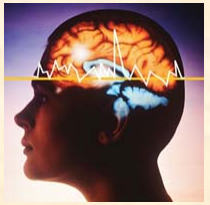
Indications for cEEG in SE

Indication	Class/Level of evidence
Recent clinical seizure or SE without return to baseline >10 min	Class I, level B
Coma, including post-cardiac arrest	Class I, level B
Epileptiform activity or periodic discharges on initial 30 min EEG	Class I, level B
Intracranial hemorrhage including TBI, SAH, ICH	Class I, level B
Suspected non-convulsive seizures in patients with altered mental status	Class I, level B



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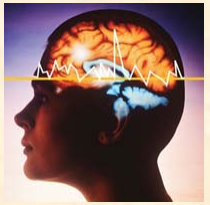
Continuous EEG treatment endpoints

EEG defined endpoint	Class/Level of evidence
Cessation of non-convulsive seizures	Class I, level B
Diffuse beta activity	Class IIb, level C
Burst suppression 8–20 s intervals	Class IIb, level C
Complete suppression of EEG	Class IIb, level C



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