Neurological Emergencies

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The speaker has no disclosures

Case #1

- A 67F is hospitalized with a community-acquired pneumonia. On Day#3 she is feeling much better awaiting discharge when her nurse finds her unresponsive with rhythmic shaking of all limbs.
- PMHx: COPD
- Meds: Ceftriaxone, NKDA
- SH: 100pk yr hx tobacco, no hx EtOH
- FH: No neurologic disease

Case #1

- You are called to the bedside and after 3 minutes, these movements have not stopped. Options for your next course of action are….

A. Continue to wait for the spell to subside

B. Administer IV Diazepam

C. Administer IV Lorazepam

D. Administer IV Fosphenytoin

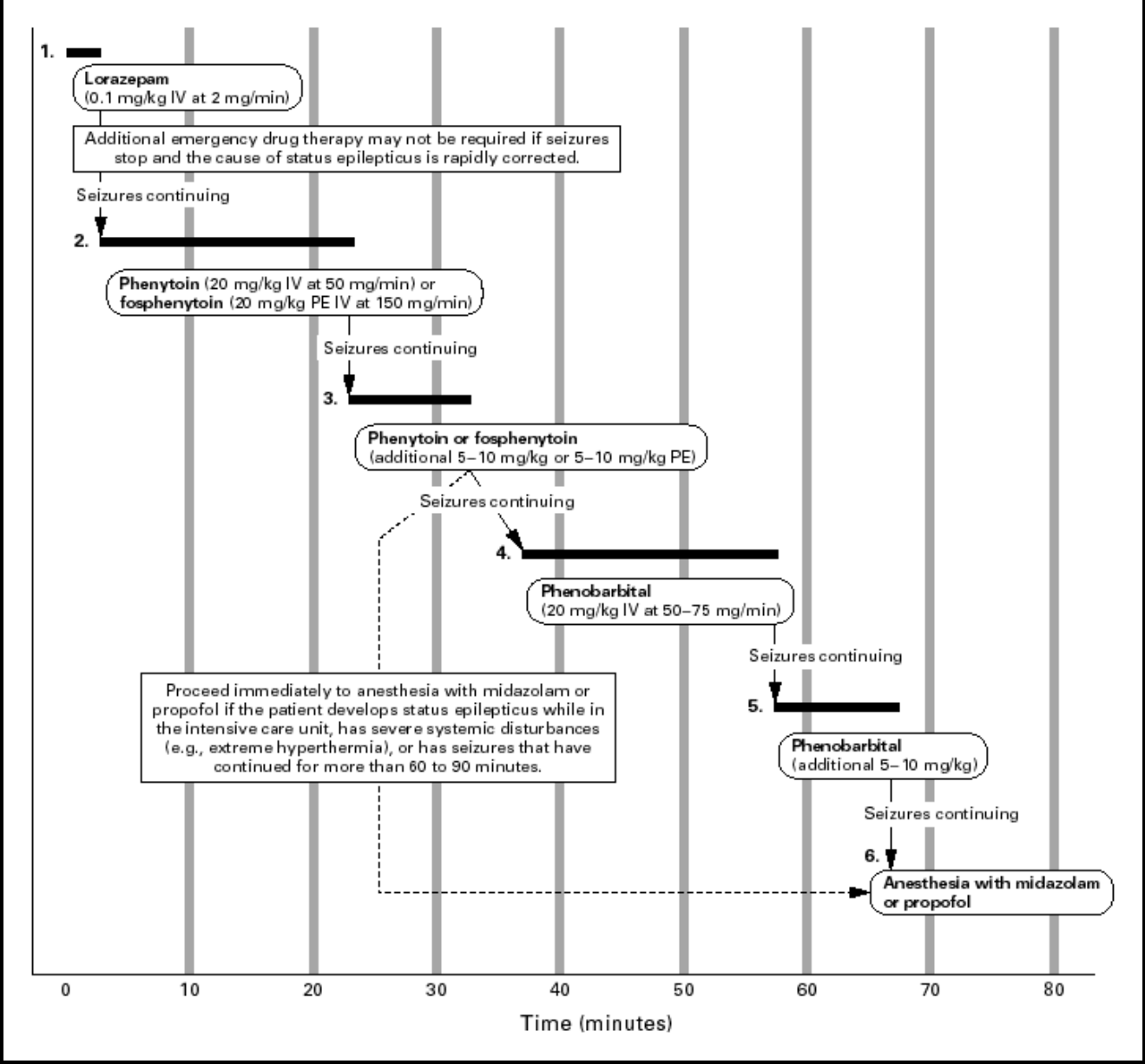
Case #1

- Following Lorazepam 2mg IV x 3 (2 minutes apart), the patient is still having these movements (now 7 minutes). What is your next course of action?

Status Epilepticus

- Changing definition and time window
- Incidence: 100,000 to 150,000 per year nationally
- Contributes to 55,000 deaths per year nationally
- 12 to 30 percent of epilepsy first presents as status
- Generalized convulsive status most dangerous

Previous Algorithm



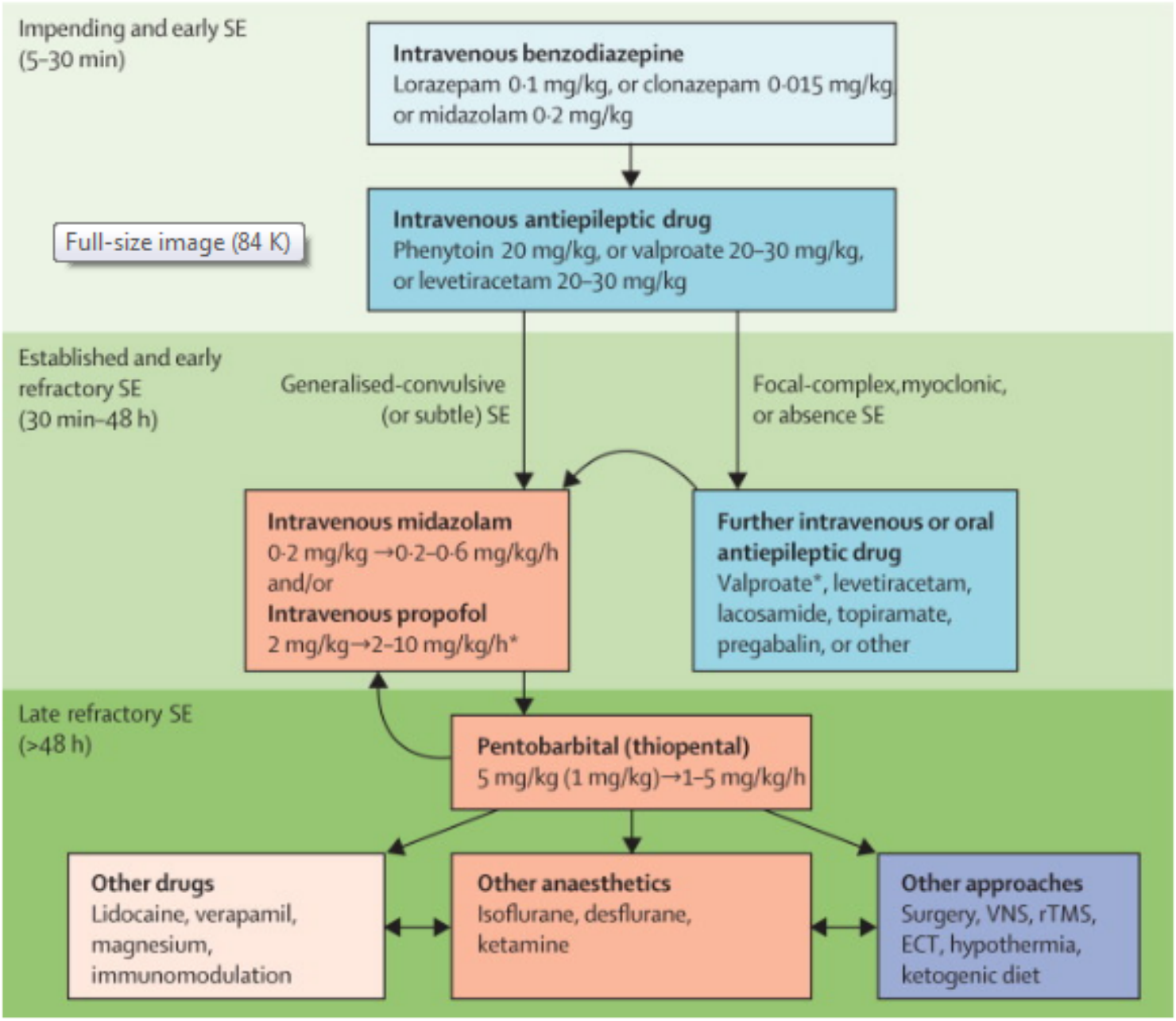
Lowenstein DH, et al: *N Engl J Med* 338:970, 1998

Status Epilepticus Algorithm: Real World

1. Lorazepam 2mg IV q2 minutes up to 6-8mg or Midazolam 10mg IM*
2. Fosphenytoin 18-20mg/kg (Dilantin Equivalents) IV

2a. Fosphenytoin additional 10mg/kg or Phenobarbital

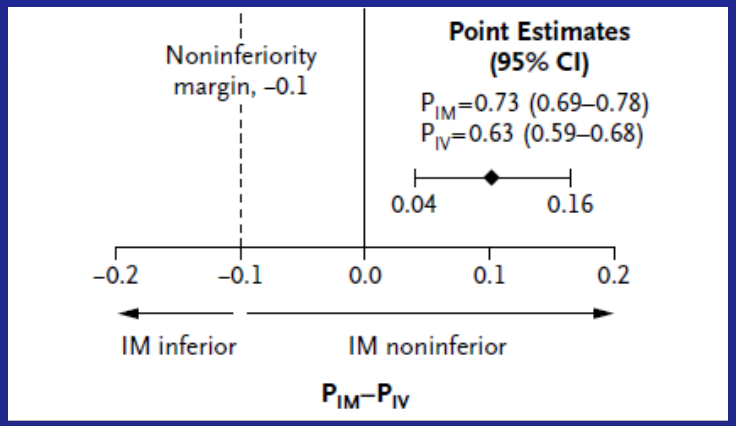
3. General Anesthesia with continuous EEG
    a. IV Midazolam gtt
    b. IV Propofol gtt



Rossetti AO *Lancet Neurol*, 2011

IM Midazolam: RAMPART

- Out of hospital non-inferiority trial
  - 4 mg lorazepam IV vs. 10 mg midazolam IM (the latter using a novel autoinjector)
- Primary outcome: absence of sz at time of ED arrival without the need for rescue therapy



Silbergleit R, et al. *N Engl J Med*, 2012

Status Epilepticus: New Advances

- Change in definition and time window
- IV Depakote (Depacon)
- IV Levetiracetam (Keppra)
- Decrease incidence in epileptics with prescribed “Status Rescue Meds”

Seizure Management: Once the Spell Stops

- Key Question:

  1st seizure or known epilepsy

Seizure Management: First Seizure

- Careful history of the spell: before (including recent events), during, after
- Determine all meds patient is on
- Careful neuro exam looking for focal signs
  - Focal exam= Partial seizure= Focal lesion

Seizure Management: First Seizure

- Work-up for provokers
  - Head trauma?
  - Utox, EtOH history and possible level
  - CBC, Lytes, Ca/Mg/Phos, BUN/Cr, LFTs
  - CT (usually with contrast)
  - Very low threshold to LP
- Needs outpatient work up including: EEG, MRI, and neurologic consultation

Seizure Management: Known Epilepsy

- 1. Non-compliance
  - Determine AEDs including doses
  - Send levels of AEDs if possible
  - Med-Med interactions
- 2. Infection
  - CXR, urine, blood cx, consider LP

- Best to curbside primary neurologist regarding any medication changes to current regimen

Case #2

- A 50 year-old man is brought in to the ED by his girlfriend with several days of paranoia and unusually aggressive behavior.
- General physical exam is normal. Neurologic examination shows a disoriented man threatening the staff
- Labs: Lytes, CBC, BUN/Cr, LFTs, Utox all nl
- CT head negative, CXR negative, U/A negative

What is the next test you would like to order?

A. MRI Brain
B. LP
C. Blood Cultures
D. Urinary Porphyrins
E. EEG

Lumbar Puncture

- Opening Pressure 19 cm H_20
- 18 WBCs (94% Lymphocytes)
- CSF Protein 58
- CSF Glucose 70
- Gram stain negative

- Empiric treatment begun

HSV-1 Meningoencephalitis

- Diagnosis
  - CSF lymphocytic pleocytosis (can be normal)
  - EEG (can be normal)
  - MRI (can be normal)
  - CSF HSV PCR
- If suspected, start IV acyclovir 10-15mg/kg q 8 hours

Meningitis Treatment by the Neurologist

- Perform LP immediately after imaging if any CSF infection suspected
- Empiric Bacterial Treatment
  - Vanco 1 gram IV q6-8 hrs
  - CTX 2 grams IV q12 hrs
  - Amp 2 grams IV q4 hrs (if immunosup., >60)
  - Dexamethasone 10mg IV q6

Treatable Causes of a Lymphocytic Pleocytosis

- Viral
  - Acute HIV
  - HSV, VZV
  - CMV
- Bacterial
  - Syphillis
  - Lyme
  - Leptospirosis

Treatable Causes of a Lymphocytic Pleocytosis

- Fungal
- TB
- Neoplastic
- Incompletely treated bacterial meningitis
- Parameningeal Focus

Case #3

- A 63yo man comes to the ED with 3 days of inability to walk. The patient reports a 2 week history of tingling in his hands and feet while also stating that he has been stumbling while walking for five days.

Case #3

- Exam
  - General exam nl with stable vitals
  - Mental status, cranial nerves normal
  - Motor exam with mild-moderate symmetric weakness prox>distal in the upper ext., distal>prox in the LEs
  - Sensory exam completely normal
  - Reflexes 2+ throughout except 0 ankles, plantar response flexor bilaterally

Case #3: Additional Tests

FVC/MIF: 1.2L, -30

Lumbar Puncture: Opening pressure normal, 2 WBC, Zero RBC, Protein 102, Glucose normal

Guillain Barre Syndrome: Key Points

- Clinically must think in the setting of paresthesias and weakness
  - Normal sensory exam, weakness not always ascending
  - Areflexia the rule, but not early in the disease
  - High protein with no cells on LP the rule, but not early in the disease
- EMG/NCS for diagnosis
  - Axonal and Demyelinating forms
- Antecedent illness or infection only 30%
- Other Variants: Miller Fisher variant w/ GQ1b Ab

Guillain Barre Syndrome: Key Points

- What will kill the patient
  - Respiratory Failure: Intubate for less than 20cc/kg
    - Frequent MIF/FVC
    - ICU or stepdown care always
  - DVT/PE: SQ heparin
  - Autonomic instability: cardiac (telemetry), ileus
- Treatment
  - IVIg or Pheresis, NOT steroids
  - The earlier the better

Case #4

- A 40 yo man comes to the ED with increasing weakness and dyspnea. The patient states that he has a history of myasthenia gravis diagnosed at an OSH two weeks ago but “things are going downhill.” He is on Mestinon (pyridostigmine) 60mg PO q4hrs and Prednisone 60mg PO qd. MIF is –10, FVC 250cc

Myasthenic Crisis

- True crisis vs. cholinergic crisis
- Triggers
  - Infection, surgery, initial steroids
- Management
  - Usually stop all anti-cholinesterase meds
  - Pheresis or IVIg
  - ICU, intubation, DVT/PE prophylaxis

Myasthenia Gravis: Key Points

- Two types of myasthenia
  - Young F>M
  - Old M=F
- Diagnosis
  - Antibodies (90% in generalized mysathenia)
  - EMG with repetitive stimulation

Myasthenia Gravis: Key Points

- Management
  - Pyridostigmine (Mestinon)
  - Immunosuppression
    - Prednisone first then Imuran/CellCept/Cytoxan
  - What about the Thymus?

Case #5

- A 32M comes to the emergency room with the “worst headache of his life” for 8 hours
- Non contrast CT is normal

Which of these historical points is most useful to differentiate SAH from benign headache syndromes?

A. Associated nausea/vomiting
B. Associated photophobia
C. Severity of pain
D. Peak time to maximal pain
E. Pain location

SAH Diagnosis

- CT sensitivity greatest early
- LP sensitivity greatest late
  - What do you look for?
    - Xanthrochromia?
    - Blood that fails to clear?

Wijdicks 2004

First 6-8 Hours

6-8hrs to 1-2 weeks

SAH Treatment

- Urgent Blood Pressure Management
- Etiology
  - 1. Aneurysm
    - Need to secure with clipping or coiling ASAP
      - ISAT trial (Lancet 2005)
  - 2. Trauma