



# Neurological Emergencies

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# Neurological Problems

- ◆ Headache
- ◆ Really bad headache
- ◆ Back Pain
- ◆ Seizure
- ◆ SOB
- ◆ Coma



# Neurological Emergencies

- Acute bacterial meningitis
- Cord compression
- Convulsive status epilepticus
- Respiratory failure (neuromuscular)
- Increased intracranial pressure (acute)
- Subarachnoid hemorrhage



# Acute Bacterial Meningitis

## Hx

Fever + Seizure

Fever + Headache

Fever + ☉ MS

Fever

## P.E.

Fever

Toxic appearance

Meningismus

Encephalopathy



# Acute Bacterial Meningitis

Diagnostic Tests ?



# Acute Bacterial Meningitis

Dx: CT/LP



# Acute Bacterial Meningitis

Rx = Abx

Adult < 50

Ceftriaxone + Vanc + Decadro

Adult < 50

Amp + Ceftriaxone + Vanc + Decadro



# Acute Bacterial Meningitis

To L.P. or Not L.P.  
That is the Question!



# Acute Bacterial Meningitis

## Question 1

When would you not L.P. someone with suspected bacterial meningitis?



# Acute Bacterial Meningitis

## Contraindications to Lumbar Puncture

Coagulopathy

Intracranial Mass lesions



# Acute Bacterial Meningitis

## Question 2

Is increased intracranial pressure a  
contraindication to L.P.?



# Acute Bacterial Meningitis

Not Necessarily...



# Acute Bacterial Meningitis

## Question 3

Does the absence of papilledema effectively rule out the presence of elevated intracranial pressure?



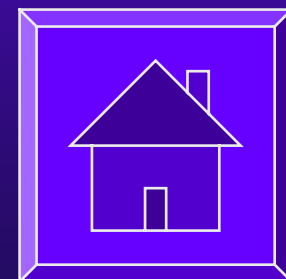
# Acute Bacterial Meningitis

Nope!



# Acute Bacterial Meningitis

Papilledema may take hours  
to manifest with  
Increased ICP





# Cord Compression

Hx:

Acute back pain

Leg weakness

Leg numbness

Sphincter

disturbances

P.E.

Pin level

Up-going toes

Hyperreflexia

Spasticity

Spinal shock



# Cord Compression

## Testing:

Plain films of the spine

Stat MRI of the T- and/or C-spine

Myelography

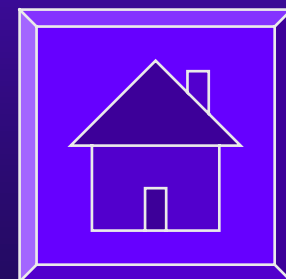
Rx: Steroids, XRT, Neurosurgery



# Cord Compression

## Scenario 1

A 40-year-old woman with a history of breast cancer presents with a one day history of inability to walk. On exam she has 2/5 strength in the lower extremities, mute toes, and a pin level at T4. MRI of the T-spine is negative.





# Convulsive Status Epilepticus

- ◆ Definition: Constant generalized seizures for 30 minutes or intermittent seizures without return of consciousness over 30 minutes



# Convulsive Status Epilepticus

Hx : shaking for 30  
minutes

PE: Still shaking

## Labs:

fingerstick glucose

Electrolytes

CBC

drug levels



# Convulsive Status Epilepticus

## ◆ A Rx Protocol

- ABC's - oral or nasal airway OK
- Oxygen - 4 liters nasal cannula
- Place pulse ox - if sats less than 92%  
92% intubate
- Establish IV access and draw bloods
- Glucose (amp of D50) and thiamine



# Convulsive Status Epilepticus

## ◆ Rx Protocol cont'd

- Ativan (0.1 mg/kg) or Valium (.25 mg/kg) IV over 10 minutes
- Phenytoin or Phosphenytoin (20 mg/Kg) IV at a a max rate of 50 mg/min
- Consider elective intubation
- Phenobarbital (20 mg/Kg) IV at a maximum rate of 100 mg/min
- Transfer to ICU for central line placement, and and pentobarbital, midazolam or propofol drip



# Convulsive Status Epilepticus

## Scenario 1

A 42-year-old man with long-standing alcohol abuse is brought in by the paramedics, actively seizing for the past 20 minutes



# Convulsive Status Epilepticus

## Scenario 2

A 24-year-old man with epilepsy is brought in by ambulance, actively seizing for 30 minutes. He has a bottle of Dilantin in his pocket.



# Convulsive Status Epilepticus

## Scenario 3

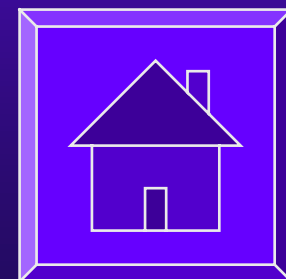
A 30-year-old man admitted for sepsis begins seizing in bed on one of the floors.




# Convulsive Status Epilepticus

## Scenario 4

A 70-year-old man admitted for decreased mental status is noted to have some facial twitching.





# Respiratory Failure (neuromuscular)

## Hx

Increasing SOB

Increasing DOE

## PE

Tachypnea

Tachycardia

Dysarthria

Use of accessory  
muscles

Difficultly finishing  
sentences



# Respiratory Failure (neuromuscular)

Testing:

ABG


Monitor FVC ( $> 15$  cc/kg)

Estimated FVC = counting x 100




# Respiratory Failure (neuromuscular)

Pulse Ox?



# Respiratory Failure (neuromuscular)

Rx: The tube

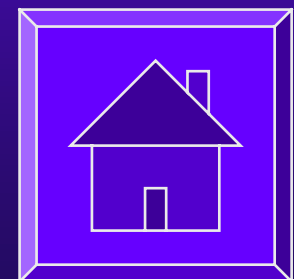


# Respiratory Failure (neuromuscular)

## Scenario 1

A 40 year-old woman diagnosed with myasthenia gravis is breathless, only being able to say 2 words with each breath.

RR = 60. Measured FVC is 500 cc. The patient can count to 20 with one breath.





# Increased Intracranial Pressure, Acute

## ◆ Hx

- Head trauma
- Sudden headache
- Sudden loss of consciousness

## ◆ P.E.

- Coma
- Reduced LOC
- Papilledema (late)
- Dilated pupils
- Posturing
  - Flexor
  - Extensor



Increased ICP

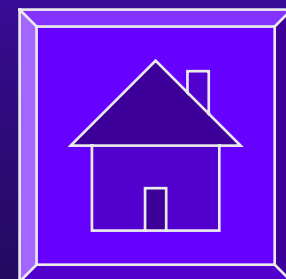
Testing: CT



# Increased ICP

## ◆ Rx

- Aim is to maintain cerebral perfusion pressure (MAP - ICP) at 50-150
- Intubate and hyperventilate to a  $p\text{CO}_2$  of **30 mm Hg**
- Lasix then Mannitol ( **1 gram/kg IV bolus** )
- CSF drainage with an intraventricular catheter (by Neurosurgery)





# Subarachnoid Hemorrhage

## ◆ Hx

- “Worst headache of my life”

## ◆ P.E.

- Meningeal signs
- Generalized hyperreflexia
- Normal or ☹ MS
- Focal findings



# Subarachnoid Hemorrhage

## ◆ Tests:

- CT +/- LP
- Angiogram

## ◆ Rx:

- Call Neurosurgery for aneurysmal clipping
- Nimodipine to prevent vasospasm
- DPH for seizure prophylaxis



# SAH/ Increased ICP

When wouldn't you order a CT scan when a person complains of having "the worst headache of their lives?"

