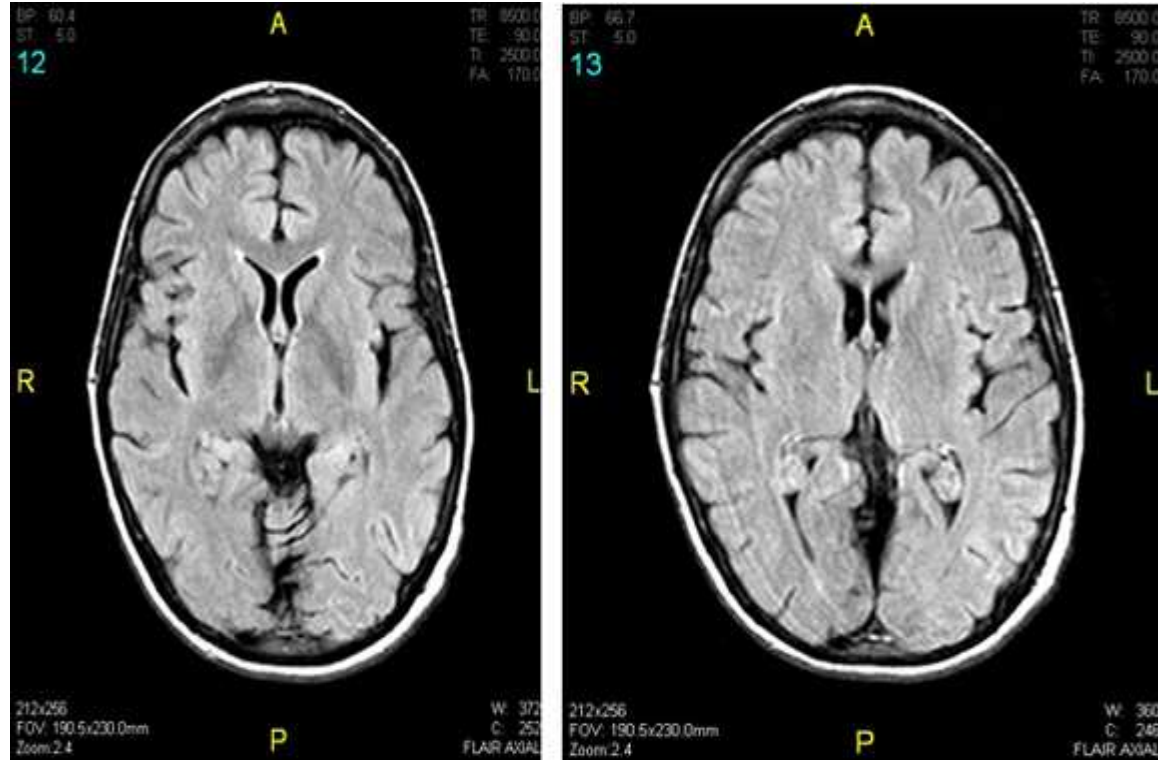




Seizures in the Hemodialysis Patient





Causes

- Uremic encephalopathy
- Dialysis Disequilibrium Syndrome
- Drugs-ESA-ertapenam-carbapenem
- Hemodynamic instability
- CNS disease
- Dialysis dementia(aluminum intoxication)
- Electrolyte disorders
- Alcohol withdrawal
- Air embolism



The **DARK SIDE** of

Aluminum

EXPOSED





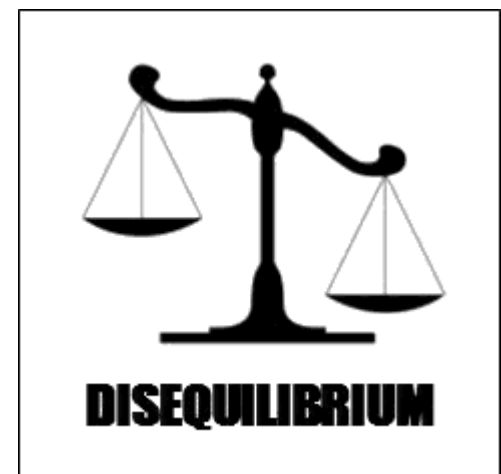
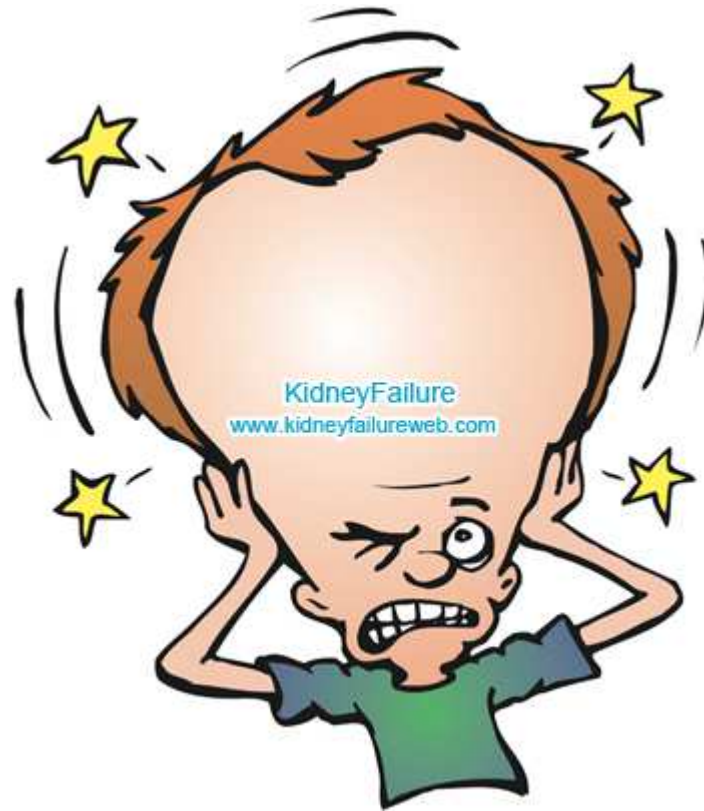
Uremic Encephalopathy

- Symptoms include:
- Irritability
- Restlessness
- Seizures
- Coma
- Death



Dialysis Disequilibrium Syndrome

- Thought to be caused by cerebral edema/changes in water content in the CNS
- BUN greater than 170 mg/dL = risk
- Severe Metabolic Acidosis = increased risk





- Urea is removed from the blood faster than from the brain tissue
- So this higher solute gradient causes water to move into brain cells
- The pH is lowered in the brain tissue which causes more tissue swelling
- This has not been entirely proven – just suggested



Other Risk Factors

- First Dialysis treatment
- Head Trauma/stroke
- Hyponatremia
- Malignant hypertension
- Sepsis/HUS TTP/CNS infections



Symptoms

- Acute symptoms develop during or immediately after hemodialysis
- Can include:
 - Headache
 - Nausea
 - Disorientation
 - Restlessness
 - Blurred vision
 - Asterixis



Diagnosis

- There is no diagnostic test
- Exclude:
 - Sub-dural hematoma
 - Cerebral infarct
 - Cerebral bleed
 - Meningitis
 - Drugs



Prevention

- Know who is at high risk
- Limit the reduction in BUN per treatment so there is a GRADUAL reduction-may need to go slow and dialyze daily x 3
- If extremely high BUN – should be dialyzed as an in-patient



Treatment

- If patients develop **mild early symptoms**- slow blood flow rate and possibly stop dialysis
- **Seizures**- stop dialysis immediately
 - maintain airway
- Stabilize hemodynamics and circulation
- Give 5-10 mg diazepam IV
- Sample blood for glucose, calcium, sodium, magnesium



- So lets talk about a case-