“D” is for Disability
Altered Mental Status in Children

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Objectives

• Describe a basic approach to evaluating mental status changes in children

• Recognize how mental status changes relate to a child’s overall clinical status

• Discuss case scenarios
  – Assessment
  – Intervention
Problem with Terminology

– Comatose
– Obtunded
– Lethargic
– Somnolent
– Irritable
– Cranky
– Fussy
– Consolable
Challenges

- Age
- Baseline Developmental Disorder
- Pain
- Medications
- Nighttime or “nap time”
- Incomplete information
How do you evaluate?

- Actually describe what the child is doing
- CHANGE in baseline
- Listen to the parents (good history)
- Modified tools
# Glasgow Coma Scale

## Adult

- **Eye Opening**
  - Spontaneous: 4
  - Voice: 3
  - Pain: 2
  - None: 1

- **Verbal**
  - Oriented: 5
  - Confused: 4
  - Inappropriate words: 3
  - Inappropriate sounds: 2
  - None: 1

- **Motor**
  - Obeys: 6
  - Localizes: 5
  - Withdraws: 4
  - Abnormal flexion: 3
  - Abnormal extensor response: 2
  - None: 1

## Infant/Pediatric

- **Eye Opening**
  - Spontaneous: 4
  - Voice: 3
  - Pain: 2
  - None: 1

- **Verbal**
  - Coos & babbles: 5
  - Irritable, cries: 4
  - Cries w/ pain: 3
  - Moans w/ pain: 2
  - None: 1

- **Motor**
  - Moves spontaneously: 6
  - Withdraws to touch: 5
  - Withdraws to pain: 4
  - Decorticate posture: 3
  - Decerebrate posture: 2
  - None: 1
Bottom Line

• GCS is a tool to communicate “objectively” between healthcare workers (trauma)
  – Can often be more helpful to describe child
  – Not validated in pediatrics

• Mild: 13-15
• Moderate: 9-12
• Severe: 3-8
AVPU

• Alert
• Verbal Response
• Pain Response
• Unresponsive

• Less specific but quick
• Not validated
Case #1: Sleepy

15-month-old girl with 2 days of cough, congestion, increased work of breathing, and poor oral intake.

Called EMS because now very sleepy with trouble breathing.
Why is there a change in Mental Status? (A&B)

10 Always think HYPOXIA (Low Oxygen)
   ■ = Oxygenation

10 Consider HYPERCARBIA (High CO₂)
   ■ = Ventilation
Why is there a change in Mental Status? (C)

• Is there sufficient Perfusion?
  – Heart rate, BP, capillary refill, dry mucous membranes, absence of tears
  – Urine Output
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• Consider **Compensated Shock**
  – IV/IO
  – 20 ml/kg Normal Saline bolus
Why is there a change in Mental Status? (D)

• Airway
• Breathing
• Circulation
• D
• E
• F
• G
Hypoglycemia

- Airway
- Breathing
- Circulation
- Don’t
- Ever
- Forget the
- Glucose
Hypoglycemia

- Less than 1 day old: < 40
- 1 day – 1 month: < 50
- 1 month – 5 years: < 60
- 6 years and older: < 70

- Our 15-month-old
  Glucose = 45
How do you give Dextrose?

• Just remember . . . 50

• Goal 0.5 gm/kg of glucose:
  – D10  = 10  x 5 ml/kg = 50
  – D12.5 = 12.5 x 4 ml/kg = 50
  – D25  = 25  x 2 ml/kg = 50
  – D50  = 50  x 1 ml/kg = 50
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Case #2:

*He was fine this morning*

- 2 year old boy found unresponsive at Uncle’s house. Was fine this morning. No other story.

- Very sleepy, slightly arouses to painful stimulation, pupils symmetric 2 to 1 mm, no external signs of trauma
Importance of Vital Signs

1. Afebrile HR 65  RR 20  BP 120/60  pOx 98%

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Importance of Vital Signs

1. Afebrile HR 65  RR 20  BP 120/60  pOx 98%
   - Bradycardic, **Hyper**tensive

2. Afebrile HR 65  RR 12  BP 72/40  pOx 88%
   - Bradycardic, low RR, **Hypo**tensive, hypoxic
Importance of Vital Signs

1. Afebrile HR 65  RR 20  BP 120/60  pOx 98%
   – Bradycardic, Hypertensive
   – INTRACRANIAL HEMORRHAGE
     • (Increased Intracranial Pressure = Cushing’s Triad)

2. Afebrile HR 65  RR 12  BP 72/40  pOx 88%
   – Bradycardic, low RR, Hypotensive, hypoxic
   – INGESTION
Case #3:

*Sleeping with his eyes open*

- 4 year old boy request for inter-hospital transport because of abnormal arm movements, now seems “out of it” and has been “sleeping with his eyes open” most of the evening

- Minimally responsive to stimuli

- What do you want to do?
Sleeping with his eyes open

• Seizure!!!!
  – Can be subtle (non-convulsive)
  – Look for vital sign changes, responsiveness, subtle stereotypic movements, eye deviation

• Management
  – A,B,Cs first – give O₂, Suction
  – Lorazepam 0.05-0.1 mg/kg IV/IO
  – Intranasal/Buccal Midazolam 0.3 mg/kg
Now that you saved all those kids

... 

Time for an Overview
Decreased Mental Status
Encephalopathy

- Hypoxia
- Hypercarbia
- Hypotension
  - Sepsis
  - Trauma
  - Other
- Medications
  - Therapeutic
  - Overdose/Ingestion
  - Withdrawl
- Metabolic
  - Acidosis
  - Hypoglycemia
  - Hyperammonemia

- Increased ICP
  - Hemorrhage
  - Mass/Tumor
  - Hydrocephalus
  - HIE
  - Pseudotumor
  - DKA
  - Meningitis
- Encephalitis
- Seizure
- Vascular
  - Stroke
  - Migraine (Complex)
Summary

• Don’t ignore changes in mental status!

• A: Protecting airway?
• B: Oxygenating and Ventilating?
• C: Perfusing Brain?
• D: Dextrose? (adequate substrate)
• E: Exposure/Trauma?
Thank you