Blue Babies, Twitchy Toddlers, and Kool Kids

By Beth Paton, MSN, RN, PNP, CEN, CPEN, FAEN

I have no disclosures

OBJECTIVES
By the end of this presentation, the learner will
• Discuss etiologies of cyanosis in neonates and infants
• List causes for seizures in toddlers
• Describe management of sepsis in pediatrics
A couple quick points about pediatric assessment

FROM THE DOOR ASSESSMENT

- Observations made on first sight
- 60 seconds or less
- Determines the urgency of intervention

NON-URGENT

- Alert
- Good tone
- Appropriate response to others
- Standing, sitting, grasping
Blue Babies, Twitchy Toddlers, and Kool Kids

**URGENT**
- Not alert
- Poor tone
- Lethargic, floppy, stiff
- Vacant eyes

**URGENT ASSESSMENT FINDINGS**
- Tachycardia
- Decreased level of consciousness
- Cyanotic, cold extremities
- Delayed capillary refill

**NON-URGENT**
- Pink, even skin tone
- Palpable pulses
- Capillary refill <2 seconds
CASE PRESENTATION #1

A 3 day old female presents with a history of apnea at home. Mom describes she placed the infant down for a nap, went to check on her and she was limp and blue. Mom stimulated her and the baby began crying and her color improved.

What other questions do you want to ask?

Questions:
- Birth history
- How has the baby been feeding?
- When was last feed?
- Any fever?
- Other children or caregivers?
Blue Babies, Twitchy Toddlers, and Kool Kids

What are you possible diagnoses?

DIFFERENTIAL DIAGNOSES

- Sepsis
- Hypothermia
- Non-accidental trauma
- Cyanotic heart defect
- Respiratory illness

DEATHS IN PEDIATRICS: UNDER 1 YEAR

<table>
<thead>
<tr>
<th>CAUSE OF DEATH</th>
<th>1980</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Congenital malformations, deformations and chromosomal abnormalities</td>
<td>9320</td>
<td>5107</td>
</tr>
<tr>
<td>Disorders related to short gestation and low birth weight</td>
<td>3648</td>
<td>4148</td>
</tr>
<tr>
<td>Sudden infant death syndrome</td>
<td>5510</td>
<td>2563</td>
</tr>
<tr>
<td>Newborn affected by maternal complications of pregnancy</td>
<td>1572</td>
<td>1561</td>
</tr>
<tr>
<td>Unintentional injuries</td>
<td>1166</td>
<td>1110</td>
</tr>
<tr>
<td>Total</td>
<td>4332</td>
<td>2458</td>
</tr>
</tbody>
</table>
Blue Babies, Twitchy Toddlers, and Kool Kids

COMPONENTS OF ASSESSMENT

- General Impression
  - Appearance
  - Work of breathing
  - Circulation to skin

URGENT
- Pale, bluish, or mottled tones
- Faint or absent pulses
- Capillary refill >3 seconds
ASSESSMENT

- Appearance:
  - Listless in mom's arms
  - Eyes open
- Breathing:
  - Slow shallow respirations
- Circulation to skin
  - Mottled
  - Delayed capillary refill
  - Cool extremities

SEPSIS

- How does sepsis present in infants?
  - Hypo- or hyperthermia
  - Apnea
  - Poor feeding
  - Poor perfusion
  - High pitched cry
**SEPSIS**

- What causes sepsis in infants?
  - Meningitis
  - Bacteremia
  - Urine sepsis
  - Pneumonia
- Most common pathogens
  - Group B strep
  - E. coli
  - Strep Pneumonia
  - Listeria
  - H. flu

**SEPSIS**

- Evaluation and management
  - Cultures
  - IV fluids
  - Antibiotics

**HYPOTHERMIA**

- Hypothermia is defined as a core body temperature <35–35.5°C
- How does hypothermia present in neonates?
  - Excessive sleeping
  - Poor feeding
  - Apnea and bradycardia
Blue Babies, Twitchy Toddlers, and Kool Kids

HYPOTHERMIA

• What causes hypothermia in neonates?
  • Environmental exposure
  • Sepsis
  • Intracranial hemorrhage
  • Drug withdraw

HYPOTHERMIA

• Evaluation and Management:
  • Rewarm with radiant warmer
  • Obtain cultures as indicated

NON-ACCIDENTAL TRAUMA

• Non-accidental trauma
  • Cyanosis and apnea from non-accidental trauma will typically be related to head injury
• How will this present in neonates?
  • Apnea
  • Bradycardia
  • Seizure like activity
  • Vomiting or poor feeding
  • Irritability
CYANOTIC HEART DEFECTS

- Truncus arteriosus
- Transposition of Great Arteries
- Tricuspid Atresia
- Tetralogy of Fallot
- Total Anomalous Pulmonary Venous Return
- Pulmonary Atresia

REPIRATORY ILLNESSES

- Bronchiolitis
- RSV
- Pertussis
- Airway obstruction
- Pneumonia
- Aspiration
  - Dysphagia
  - Reflux
- Congenital Abnormalities

TWITCHY TODDLERS
CASE PRESENTATION #2

• A 23 month old female presents with a possible new onset seizure.
  Mom rushes into the Emergency Department with her 23 month old daughter. She states she was in her usual states of health when she fell to the floor and began jerking all over.

What other questions do you want to ask?

CASE PRESENTATION #2

• Questions
  • Birth history
  • Any history of seizures in the past?
  • Any history of trauma?
  • Any recent illnesses?
  • Any possible ingestion?
  • Describe seizure in detail
  • What was child doing right before seizure occurred?

What are you possible diagnoses?
DIFFERENTIAL DIAGNOSES

- Febrile seizure
- Meningitis
- Trauma
- Ingestion
- Breath holding spell
- New onset seizure disorder

DEATHS IN PEDIATRICS: 1-4 YEARS

<table>
<thead>
<tr>
<th>Cause of Death</th>
<th>1980</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unintentional injuries</td>
<td>3313</td>
<td>1394</td>
</tr>
<tr>
<td>Congenital malformations, deformations and chromosomal abnormalities</td>
<td>1026</td>
<td>537</td>
</tr>
<tr>
<td>Homicide</td>
<td>319</td>
<td>385</td>
</tr>
<tr>
<td>Malignant neoplasms</td>
<td>275</td>
<td>346</td>
</tr>
<tr>
<td>Diseases of heart</td>
<td>358</td>
<td>179</td>
</tr>
<tr>
<td>Influenza and pneumonia</td>
<td>267</td>
<td>91</td>
</tr>
<tr>
<td>Septicemia</td>
<td>72</td>
<td>92</td>
</tr>
<tr>
<td>Total</td>
<td>8186</td>
<td>4316</td>
</tr>
</tbody>
</table>

FEBRILE SEIZURES

- Simple
  - < 15 minute duration
  - Generalized tonic-clonic
  - Self-limiting
  - One in 24 hour period
  - Brief postictal phase
- Complex
  - > 15 minute duration
  - Focal
  - More than one in 24 hour period
Blue Babies, Twitchy Toddlers, and Kool Kids

FEBRILE SEIZURES

MANAGEMENT
• LP
  • 1st time febrile seizure < 6 months
  • 1st time febrile seizure 6-12 months if H. flu or S. pneumo immunizations incomplete
  • >12 months: consider if neurological signs, complex seizure, prolonged postictal phase
  • Consider if partially treated with antibiotics or immunization status cannot be determined
• EEG - not recommended

Adapted from AAP Policy Recommendations: www.aap.org

FEBRILE SEIZURES

MANAGEMENT CONT.
• LABS
  • CBC
  • BMP or Glucose
  • Ca
  • PO4
  • Mg
• CT - in general, not recommended

Not recommended

Adapted from AAP Policy Recommendations: www.aap.org

MENINGITIS

Signs and Symptoms
• High Fever
• Nuchal Rigidity
• Headache
• Nausea and Vomiting
• Photophobia
• Seizures
• Altered LOC (irritability or lethargy)
• Bulging fontanelle
TREATMENT

• Bacterial
  • Broad spectrum antibiotics (after LP)
  • Management of septic shock/ hypotension

• Viral
  • Supportive care
  • Analgesics
    • Toradol

MENINGITIS

Diagnosis
• Clinical Presentation
• Lumbar Puncture:
  • In child with closed fontanelle with signs of increased ICP, CT should be performed first
  • Cell count, glucose and protein, gram stain
  • Common organisms are Group B strep (0-3m), H. flu, Strep pneumo, and Neisseria

TRAUMA

• Post-traumatic seizure
• Intracranial hemorrhage
• Abusive head trauma
Blue Babies, Twitchy Toddlers, and Kool Kids

**INGESTIONS**
- Cocaine
- Alcohol
- Lidocaine
- Amitriptyline
- Camphor
- Others

**BREATH HOLDING SPELL**
- Median age of onset 6-12 months
- Median frequency of spells 1 per week
- Median age of termination 36 months
- 34% had a positive family history
- Two types:
  - Pallid
  - Cyanotic

**NEW ONSET SEIZURE DISORDER**
- Evaluate for other etiologies
- EEG
A 7 year old boy present with hypothermia. Mom relates she picked him up from school today. He was complaining of a headache and chills. As the evening progressed, he wasn’t responding well to mom and his extremities were cool to the touch.

What are your differential diagnoses?

SHOCK!!!!
KOOL KIDS

• If a school aged child or adolescent presents with an altered level of consciousness and cool extremities, they are in shock!!

• WHY???

KOOL KIDS

• Sepsis
• Hypovolemia
• Distributive shock
• Ingestion
• Sepsis

DEATHS IN PEDIATRICS: 5–14 YEARS

<table>
<thead>
<tr>
<th>CAUSE OF DEATH</th>
<th>1980</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unintentional injuries</td>
<td>5224</td>
<td>1643</td>
</tr>
<tr>
<td>Malignant neoplasms</td>
<td>2667</td>
<td>146</td>
</tr>
<tr>
<td>Congenital malformations, deformations and chromosomal abnormalities</td>
<td>221</td>
<td>245</td>
</tr>
<tr>
<td>Suicide</td>
<td>142</td>
<td>174</td>
</tr>
<tr>
<td>Homicide</td>
<td>818</td>
<td>261</td>
</tr>
<tr>
<td>Diseases of heart</td>
<td>330</td>
<td>188</td>
</tr>
<tr>
<td>Total</td>
<td>7649</td>
<td>2274</td>
</tr>
</tbody>
</table>

Unintentional injuries: 1980 - 5224, 2010 - 1643
Malignant neoplasms: 1980 - 2667, 2010 - 146
Congenital malformations, deformations and chromosomal abnormalities: 1980 - 221, 2010 - 245
Suicide: 1980 - 142, 2010 - 174
Homicide: 1980 - 818, 2010 - 261
Diseases of heart: 1980 - 330, 2010 - 188
Total: 1980 - 7649, 2010 - 2274
**SEPSIS**

- What causes sepsis in school aged kids and adolescents?
  - Toxin mediated reaction
  - Neisseria meningitidis
  - Pneumonia
  - CLABSI
  - Colitis

**HYPOVOLEMIA**

- Trauma
- Gastroenteritis
- Meckel's diverticulum
Blue Babies, Twitchy Toddlers, and Kool Kids

CIRCULATION

- Capillary refill time
- Skin temperature
- Pulses
- Clammy
- Heart rate

TRAUMA
Blue Babies, Twitchy Toddlers, and Kool Kids

**TRAUMA**

![Image of trauma-related scans]

**HE HAS BLOOD IN HIS STOOL!**

- Labs: Hgb 5.2, Hct 15.3
- KUB: Normal

**MECKEL'S DIVERTICULUM**

![Image of Meckel's diverticulum with text: Embryonic remnant of vitelline duct]
MECKEL'S DIVERTICULUM

- Treatment
  - Admission
  - IV fluids
  - Meckel's scan
  - Possible transfusion
  - Surgery

IN CONCLUSION

CHALLENGES OF PEDIATRIC ASSESSMENT

- Child
  - Fear
  - Pain
  - Guilt
- Parent Fear
- Clinician Fear
Blue Babies, Twitchy Toddlers, and Kool Kids

PEDIATRIC ASSESSMENT PEARLS

• Treat the patient
• Don’t listen to drama
• Listen to Parents
• Listen to Nurses, Medics, etc
• Listen to your instinct
• Trust your instinct

AND, A COUPLE MORE REASONS WHY I LOVE PEDIATRICS