Clinical Problems in Childhood and Adolescence

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A very little bit… on Growth and Development
Normal Growth in Children

• Weight
  • Weight loss in first few days of life— 5-10%
  • Regain birth weight by DOL #10
  • Double birth weight by 4-5 months
  • Triple birth weight by 1 year
  • Quadruple birth weight by 2 years
  • Daily weight gain
    • 10-30g for first 3 months
    • 15-20g for remainder of 1st year
Failure to Thrive

- Generally described as <3%tile for weight or decrease over 2 major percentiles
- Psychological, biological, environmental causes
  - Stress
  - Genetic syndrome/FAS
  - GI abnormality
  - Low intake
**Puberty**

- **Girls**
    - African American (12.06 years)
    - Mexican American (12.09 years)
    - Caucasian (12.52 years) [J.Peds, 2005]
  - Development of secondary sex characteristics prior to age 8 is considered precocious
  - Causal factors suggested: increased BMI, increased animal fat intake, exposure to endocrine-disrupting chemicals (BPA, phthalates)

- **Boys**
  - African-American and Caucasian males mature at comparable ages
  - Sexual development before age 9 is considered precocious
Puberty

- **Girls**
  - Breast development $\rightarrow$ pubic hair development $\rightarrow$ growth spurt $\rightarrow$ menarche

- **Boys**
  - Increased testicular volume $\rightarrow$ pubic hair development $\rightarrow$ penile enlargement $\rightarrow$ growth spurt
Developmental Problems – Speech and Language

• Speech and language delay - most common
  • Often constitutional but can indicate bigger issues such as autism

• Language delay warnings
  • 3 yo – not using short phrases
  • 4 yo – no 3 word sentences
  • 5 yo – not following 2 part commands

• Screening
  • Hearing screen at birth
  • 9 months – screen via ASQ
  • 24 months – M-CHAT (Modified Checklist for Autism in Toddlers)
Growth and Developmental Delay

- Fetal Alcohol Syndrome
- Fragile X
- Failure to Thrive
Fetal Alcohol Syndrome

- Common reason for poor growth
- Cognitive delay
- Behavior problems
- No known safe level of alcohol consumption
Fragile X Syndrome

- 1/400 carry gene; Males > Females
- 1/2000 males affected 1/4000 females
- Low IQ, behavior problems

- normal structure
- broad forehead
- elongated face
- large prominent ears
- strabismus (crossed eyes)
- highly arched palate
- hyperextensible joints
- hand calluses (from self-abuse)
- pectus excavatum (indentation of chest)
- mitral valve prolapse (benign heart condition)
- enlarged testicles
- hypotonia (low muscle tone)
- soft, fleshy skin
- flat feet
- seizures (in about 10 percent)
Childhood Deaths
Childhood Deaths: Think ACCIDENTS!

- 46% decrease in accidental deaths in the past 20 years due to improved safety measures.
- Accidental death causes
  1. MVA
  2. Falls
  3. Poisoning
  4. Drowning
  5. Fires/burns
Childhood Deaths—all causes

0-1 years:
- Developmental and genetic conditions present at birth
- Sudden Infant Death Syndrome (SIDS)
- All conditions associated with prematurity/low birth weight

1-4 years:
- Accidents
- Developmental and genetic conditions present at birth
- Cancer
Childhood Deaths - all causes

5-14 years:
• Accidents
• Cancer
• Homicide

15-24 years:
• Accidents
• Homicide
• Suicide

Most deaths > age 5 are PREVENTABLE!
Sudden Infant Death Syndrome

- SIDS

Risk factors
- prone sleeping position
- smoke exposure
- soft bedding
- prematurity
- perinatal drug exposure
- African/Native American
Sudden Infant Death Syndrome

- SIDS– prevention works!
- Sleeping in same room with adults
- Pacifiers when falling asleep
- BACK TO SLEEP!!!

Back to Sleep Campaign introduced 1992-4
Death Rates (per 100,000)

<table>
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<th>Year</th>
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<th>1998</th>
<th>2001</th>
<th>Current</th>
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<td>87</td>
<td>71</td>
<td>55</td>
<td>40’s</td>
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Other Common Issues in Primary Care
 DEFINITION: Healthy, well fed infant with paroxysms of crying lasting >3 hours per day and occurring more than 3 times per week.
Colic

- Does not occur in the first days of life
- Most affected infants develop symptoms by 2 weeks of age
- Most episodes occur early in the evening
- Most infants are colic-free by 3 months of life
Colic

- Treatment
  - Rhythmic Rocking
  - Encourage sucking
  - Swaddle, bundle, cuddle
  - DON’T medicate
  - Be patient, and realize that it will go away
Iron Deficiency Anemia

- Common in US children ages 12-36 months (5.5% with Hgb <11.0)
- Dietary Iron
  - 8-10 mg iron must be consumed each day
  - 2-3 times more iron is absorbed from human milk than formula
  - breast milk or iron fortified formula is recommended for the first year of life
  - An additional source of iron should be provided at 4-6 months of age
Iron Deficiency Anemia

- Most common between 9-24 months of age
- Cows milk often the culprit
  - little bio-available iron
  - replaces food with higher iron content
  - inhibits iron absorption
  - can cause GI bleeding
Iron Deficiency Anemia

- Response to oral iron administration
  - reticulocytosis - 48-72 hours
  - increase in hemoglobin - 4-30 days
    (increase in hemoglobin by 1 gm/dl after 1 month of therapy)
  - increase in iron stores - 1-3 months
Lead Poisoning

- Contributes to iron deficiency anemia
- Chelation very rare in areas without lead paint
  - East Coast higher
  - Currently less than 2% of kids have levels >10 mcg/dl
- Screen 9-72 months; more for high risk
- NO SAFE LEVEL
  - Evidence of decreased cognitive function
  - Recommendations for >10
  - Recheck in 3 months if elevated
Vitamin D Supplementation

- Old recommendation: Breastfed infants should start on vitamin D supplementation at 400 IU per day (AAP 2003)
- New recommendations: 400 IU vitamin D supplementation for ALL infants and children beginning in the first few days of life
- Supplementation can be stopped if
  - taking >1000ML formula daily
  - >1 year and taking Vit-D fortified milk at >32oz/day
Vitamin Supplementation

Summary:

- Vitamin D supplementation at 400 IU daily starting at birth (goal about 800 total)
- Change to Vitamin D plus iron supplementation at 4-6 months
- Continue both until 5 years
- Consider ongoing Vitamin D supplementation (along with Calcium) for older children and adolescents at 400-800 IU/day
Breath Holding Spells

- Common phenomenon in healthy children
- Usually occurs between 6-18 months of age
- Family history in 23-30%
- Onset before the age of 5 years old
- Breath is held on exhalation
Breath Holding Spells

- Sequence of events in Breath Holding Spell
  - precipitating event
  - child cries or becomes upset
  - noiselessness, exhalation, cessation of breathing
  - color change, hypotonia
  - in severe cases, seizure activity
  - limpness, return of consciousness
Breath Holding Spells

- Types of Breath Holding spells
  - cyanotic
  - pallid
- Frequency
  - once a year to several a day
  - peaks at age 2 years
Breath Holding Spells

• Differential Diagnosis
  • Seizures
  • Syncope
  • Prolonged QT

• Prognosis
  • Excellent if no underlying process
Enuresis

- Incidence
  - 5 year olds: 15-20%
  - 10 year olds: 5%
  - 15 year olds: 1-2%
- Annual spontaneous cure rate is 15%
- Nocturnal enuresis common in males
- Diurnal enuresis more common in females
Enuresis

- **Etiology**
  1. Family history
  2. Bladder Capacity
  3. Developmental lag
  4. Sleep level
  5. Psychological factors
  6. Inadequate ADH secretion
Enuresis

- **Uncomplicated**
  - Nocturnal symptoms
  - Normal physical examination
  - Negative UA and urine culture
- **Complicated**
  - History of voiding dysfunction
  - Abnormal neurologic or abdominal exam
  - History of UTI
  - Positive UA
Enuresis Interventions

- Should be age appropriate
- Initiated only after full work-up reveals no abnormalities
- 3 years:
  - Self awakening hints
  - Good bedtime habits
  - Empty bladder
  - Limit fluids
  - Praise for dry mornings
Enuresis-- Interventions

- **6 years:**
  - Self awakening tips
  - Motivational techniques

- **8 years:**
  - Enuresis alarm
  - Drugs intermittently for special events

- **12 years:**
  - Enuresis alarm
  - Drugs continuously for 2-6 months
Non-Infectious Abdominal Complaints

- Acute Scrotum
- Acute Abdomen
- Intussusception
Acute Scrotum

• **History**
  - Age, onset of symptoms, prior trauma, associated findings (rash, fever, etc.)

• **Physical Exam**
  - Cremasteric reflex
  - Appearance of scrotum
  - Palpation
Acute Scrotum

- Differential diagnosis of painful, enlarged testis:
  - Testicular torsion
  - Torsion of the appendix testis
  - Trauma
  - Epididymitis
  - Tumor
Testicular Torsion

Normal Anatomy

- Vas deferens
- Blood vessels
- Testis

Testicular Torsion
Testicular Torsion

- Anatomic deformity
- Typical history
  - Acute onset, with nausea and vomiting
  - While active, at rest, or after trauma
  - Often history of similar events, although less severe
Testicular Torsion

- Physical findings
  - Scrotal edema, erythema, high riding testicle
  - Entire testicle is tender (as opposed to “blue dot” and focal tenderness of appendix torsion)
  - Spermatic cord “knot”
  - Absent cremasteric reflex
Testicular Torsion

- Radiologic studies
  - Decreased blood flow on nuclear scan

- Treatment
  - Surgical emergency
  - Detorse the affected testicle and anchor both sides
Intussusception

- Invagination/telescoping of proximal intestine into the adjacent bowel
- Often a “lead point” in Peyer’s Patch
- Most common cause of intestinal obstruction between 3 months and 6 years of age
- Etiology unknown in 95%
Intussusception - Definition

- Presentation: crying with severe, colicky (due to peristaltic rushes) abdominal pain, flexion of the knees and hips
- The initial pain subsides with infant quite comfortable between episodes
- Over time: increasing frequency of pallor, diaphoresis, and increasing pain may occur
Currant Jelly Stool
Intussusception: Plain Film

Mass (M) and dilated Bowel loops
Intussusception: Barium Enema

“Coiled Spring”
Intussusception: Management

- Resuscitation
- Enema Reduction
  - Barium/Air
- Surgery
Intussusception: Prognosis

- Untreated intussusception in infants is almost always fatal
- Recurrence is rare at >24 hours post reduction
- Mortality rate rises rapidly after 24 hours, especially after the 2nd day
- Spontaneous reduction during preparation for operation is not uncommon
- Long terms complications are few

From Sept 1, 1998 - July 7, 1999: 15 cases of intussusception among infants who had received RRV-TV.

Several studies also noted higher incidence rate within the 1st week after RRV-TV.

CDC recommended suspending routine vaccination.

2006 new formulation approved; currently in use with no increase in intussusception noted.

Now 2 formulations RotaTeq and Rotarix.
Non-Infectious Rashes

- Idiopathic Thrombocytopenic Purpura
- Henoch Schonlein Purpura
Idiopathic Thrombocytopenic Purpura (ITP)

- Common acquired bleeding disorder in children < 10 years old
- Manifestations:
  - platelet count < 150,000
  - normal bone marrow
  - purpuric rash
  - absence of other causes of thrombocytopenia
ITP

- Clinical signs and symptoms
  - Petechiae, purpura, epistaxis, hematuria
  - Preceding viral illness
  - Absence of hepatosplenomegaly
ITP

- Laboratory studies
  - Thrombocytopenia
  - Mild anemia sometimes
  - Platelets may be large
  - Normal bone marrow
  - Normal peripheral blood smear
• Natural history of ITP
  • Most cases of ITP in children are acute
  • 75% spontaneously remit within 6 months
  • Mortality is less than 1% (CNS bleeds)
ITP

- Management
  - Steroids
    - Concern for use if malignancy not ruled out
    - cause a rapid rise in platelet count
  - IVIG
    - similar rise in platelet count as compared to steroids
    - no need for bone marrow
  - Anti-D (winrho)
    - Coats normal red cells and helps block spleen’s destruction of platelets
Henoch Schonlein Purpura (HSP)

- IgA mediated small vessel vasculitis
- Generally in children between 2-12 years of age
- 75% with preceding URI
- Boys 1.5/Girls 1.0
HSP

• Clinical Manifestations
  • Purpuric rash (100%)
  • Abdominal pain (50%)
  • Scrotal edema in boys
  • Other edema: periorbital, distal extremities
  • Arthritis (knees, ankles, hands)
  • Hematuria (up to 80%)
  • Nephritis (20-30%)
HSP

- Treatment:
  - NSAIDS
  - Supportive
  - Occasional cytoxan for severe kidney disease
    - Although very rare, renal failure is the most common serious complication
  - Steroids
    - soft tissue swelling
    - scrotal swelling
    - abdominal pain
Altered Mental Status

- Seizures (febrile and nonfebrile)
- ALTE
- DKA
- Ingestions
- Shaken Baby Syndrome
Febrile Seizures

**Typical Febrile Seizure**
- Generalized, tonic-clonic
- <15 minutes duration
- Child 6 months-5 years old
- (peak 15-18 months)
- One seizure in 24 hour period
Atypical/Complex Febrile Seizure:
- Prolonged >15 minutes
- >1 seizure in 24 hours
- Focal
- Todd’s Paralysis after the seizure qualifies it as complex
Febrile Seizures: Facts and Stats

- Occur in 3-4% of all children
- 25-30% of kids with febrile seizures will have a second and 50% of those with a second will have a 3rd
- FS do NOT cause MR, CP, learning disorders
- FS do not cause epilepsy or afebrile seizures
- However....
• Family history of epilepsy, preexisting neurologic disease, and the history of a complex febrile seizure correlate with increased incidence of epilepsy later in life
• If all 3 of the above exist, increased risk of seizure disorder to 10-15%, up from baseline of 0.4% in population
Febrile Seizure: Work-up

- STOP! Work up the FEVER
  - 73% of the time it’s OM, URI, pharyngitis, viral exanthems
- If the child returns to baseline status, no seizure work-up needed
- Blood Studies (lytes, Ca, Mg, Phos, glucose) are NOT routinely recommended
- EEG NOT routinely recommended
- LP NOT routinely recommended
  - Consider in child <12 months and in anyone with meningeal symptoms
Febrile Seizure: Treatment

- Treat the cause or the fever
- Consider RTC acetaminophen or ibuprofen early on in the infection
- In children with multiple recurrences, consider rectal diazepam
Childhood Asthma

- Childhood asthma is (still!) on the rise
- #1 cause of school absences
- #1 admitting diagnosis
- 7-16% of kids have asthma (California, 2013)
  - 15.2% prevalence for African American children
  - 9.4% for Caucasian children
- Higher in inner city, low income kids
- Majority diagnoses < age 5
- Often associated with allergies
Management of exacerbations

- **Albuterol** – nebulized and MDI have same efficacy
- **Ipratropium Bromide** – adjunctive to albuterol in acute management but not in daily maintenance
- **Magnesium Sulfate** – helpful in patients not responding to albuterol treatments
- **Systemic steroids** – should be initiated when not responsive after initial albuterol treatments or when admission is being considered
  - Oral dexamethasone well tolerated
Asthma

- Inhaled corticosteroids are safe and effective for children!
- New guidelines focus on functional status as well as baseline diagnosis
- Rule of 2’s
  - Daytime symptoms >2x weekly
  - Nighttime symptoms >2x monthly
  - Exacerbations >2x yearly
  - If yes to any of the above, need ICS for 1-3 months and then reassess!
Questions?