Pediatrics: Nursing Management & Clinical Pearls for Primary Care

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Objectives

• Describe the most common acute pediatric illnesses that present in primary care & urgent management of them.

• Discuss behavioral & developmental issues that commonly present in primary care pediatrics.
General Guidelines

• Take your cues from the child and parents

• Anticipatory guidance is key to every situation

• Most infections are viral in nature

• Respiratory emergencies are most common in children

• Double by 6 months, triple by a year - the weight rule
Questions to Consider

• What is the patient doing?

• What should the patient be doing?

• Are they not doing something they should be due to acute illness or other factors?

• How are parents acting? (check: child abuse)
Topics

• Infant Feeding & Nutritional Issues
• Childhood Rashes
• Respiratory Distress & Asthma
• Immunizations
• Urinary Tract Infections
• Autism
• Developmental Delays
• ADHD
• Obesity
Infant Feeding and Nutritional Issues

• Breastfeeding
  – Practice guidelines
  – Difficulty with feeding
  – Anticipatory guidance

• Newborn Jaundice
  – Differences between physiological jaundice and breastfeeding jaundice
  – Management of hyperbilirubinemia

• Colic/Reflux
  – Diagnosing, treating and managing in an infant
  – The inconsolable infant
What is the period of greatest growth in children?
Newborn Feeding

• Breastfeeding recommended for 1st year of life
  – Improved immunity due to presence of immunoglobulins

• Minimum 6 months of life

• If using formula - iron fortified

• Do not introduce cow’s milk until 1 year of life
  – Can contribute to iron-deficient anemia

• Ensure full fat cow’s milk
  – Important for brain development

• Vitamin D supplementation for breast feed infants
Question

• A bottle fed infant (3 months) comes to the office for a well child visit.

• You met this child and mother at the last visit; you are continuing to review nutritional needs.

• What concepts would ensure the mother has had sufficient teaching?
Hyperbilirubinemia

• Imbalance of bilirubin production and elimination

• In order to clear from body must be:
  – Conjugated in liver
  – Excreted in bile
  – Eliminated via urine and stool
Clinical Significance of Hyperbilirubinemia

• Most common reason that neonates need medical attention

• “Physiologic jaundice” is a normal phenomenon during transition

• Becomes concerning when levels continue to rise
  — Unconjugated bilirubin is neurotoxic
Clinical Symptoms

• Jaundice / Icterus:
  – Newborn icterus notable once total bilirubin > 5-6 mg/dL
  – Versus older children/adults once > 2 mg/dL

  – Progresses cranially to caudally

  – CAUTION: Visual assessment is subjective, inaccurate, and dependent on observer experience!
Clinical Symptoms

• Acute Bilirubin Encephalopathy/Kernicterus:
  – Irritability, jitteriness, increased high-pitched crying
  – Lethargy and poor feeding
  – Back arching
  – Apnea
  – Seizures
  – Long-term
    – Choreoathetoid CP
    – Upward gaze palsy
    – SN hearing loss
    – Dental dysplasia
Diagnosis of Hyperbilirubinemia

• Careful clinical assessment and monitoring

• Thorough history:
  – Pregnancy and delivery history
  – General health status and infectious risk
  – Feeding method and feeding progress
  – Vital signs and ins/outs (hydration status)
  – Risk factors for isoimmunization
  – Family history and ethnicity (ie. G6PD, spherocytosis, etc.)

• Physical exam
  – Activity level, feeding ability, bruising/hematoma, plethora
Neonatal Hyperbilirubinemia

- Physiologic vs. Pathologic
  - Jaundice < 24 hrs is always pathologic!

- Indirect vs. Direct (Unconjugated vs. Conjugated)
Pre-term vs. Full-term Hyperbilirubinemia

- Pre-term infants at higher risk due to further reduced activity of liver conjugating enzymes

- Pre-term infants can develop encephalopathy or kernicterus at lower total bilirubin levels
Colic / Reflux

• Colic
  – A frustrating condition marked by predictable periods of significant distress in an otherwise well-fed, healthy baby
  – Babies with colic often cry more than three hours a day, three days a week for three weeks or longer
  – ANTICIPATORY GUIDANCE IS KEY!
  – Offer:
    – Swaddling techniques
    – Coach through allowing baby to “cry it out”

• Reflux
  – A condition where the contents of the stomach are spit out, usually shortly after feeding. Spitting up (infant reflux) becomes less common as a baby gets older, and it's unusual if it's still occurring after 18 months of age
  – Consider allergy as well
Childhood Rashes

• Viral Rashes
• Rashes related to Immunizations
• Varicella (aka Chicken Pox)
• Ringworm
• Dermatitis
• Hand, Foot & Mouth
Question

Mom calls to say child has a red rash over trunk and upper legs

What more do you want to know?
Viral Rashes

• Erythematous red usually raised

• No specific pattern

• Blanches with pressure

• Usually not irritating or itchy (if itchy, most likely an allergic reaction)

• NO TREATMENT
Rashes Related to Immunizations

- Usually as a response to the vaccine
- Can appear anywhere from 5-28 days after vaccine
- Most common with MMR, Varicella & Hepatitis B vaccines
- Low grade fever common with rash
What Is Distinctive About This Rash?
Varicella
Varicella (Chickenpox)

• Symptoms

– The earliest symptoms of chickenpox are fever, sore throat, and feeling tired. This is followed, usually within a day, by the appearance of the classic, intensely itchy rash that typically begins on the head and torso and then spreads outward to the arms and legs. The total duration of the rash is seven to 10 days.

– The rash begins as an area of redness with a small, superficial blister in the center. After one to two days, the blister ruptures and the lesion will form a crusty scab that will fall off in two to three days. This entire evolution takes four to five days.

– Thus, children with chickenpox will have new outbreaks of the initial lesions as older crusted lesions are resolving. They characteristically will have both new and older lesions present at the same time.
Atypical Varicella (Chickenpox)

- Children can develop a mild case of varicella if vaccinated

- Shingles is a painful localized skin rash often with blisters that is caused by the varicella zoster virus (VZV)

- Anyone who has had chickenpox can develop shingles because VZV remains in the nerve cells of the body after the chickenpox infection clears and VZV can reappear years later causing shingles.
Question

A mother calls the office to ask when she can send her son back to school, he broke out with the Chickenpox 2 days ago.

What is the appropriate response?
Ringworm

• Common fungal infection of pediatric patients

• Can occur of the scalp, the body and the feet

• Contagious

• Treat with an oral agent, topical medications ineffective
Dermatitis

• Most common is “contact” dermatitis
• Usually related to moist, warm environment
• Caused by clothing, dyes, soaps, detergents
• Aggravated by urine or stool (diaper area)
• Bright red maculopapular rash

• Interventions:
  – Area clean and dry
  – Open to air if possible
  – Apply skin creams with vitamin A or D for healing
• What are recommendations to offer to mother of an infant with diaper rash?

  – Change to cloth diapers
  – Remove diapers and expose to air
  – Use ½ strength hydrogen peroxide in place of wipes
  – Change formula
Hand, Foot and Mouth
Hand, Foot & Mouth (Coxsackievirus)

• Coxsackievirus infections are more common in the summer and autumn

• All childhood age ranges are susceptible

• Symptoms
  – Develop moderate fever for one or two days and then characteristic rash
  – Rash includes tender blisters in mouth and tongue as well as on palms and soles of hands and feet
  – Occasionally rash will also occur on buttocks or genital area
  – Young children have a general feeling of being ill (malaise) and are often cranky with a depressed appetite
  – The incubation period following exposure is five days
Other Skin Issues

• Scabies

• Lice

• Acne
Respiratory Distress and Asthma
Respiratory Assessment

- HR (pulse)
- RR (per minute)
- Breathing pattern
- Use of accessory muscles of ventilation
- Level of agitation
- Skin color
Asthma

• Asthma is classified by severity using these criteria
  – Frequency, severity, and duration of symptoms
  – Degree of airflow obstruction (spirometry measure) or peak expiratory flow (PEF)
  – Frequency of nighttime symptoms and the degree to which asthma interferes with daily activities

<table>
<thead>
<tr>
<th>Age</th>
<th>Normal RR/minute</th>
<th>Tachypnea</th>
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<tr>
<td>2-12 months</td>
<td>25-40</td>
<td>&gt; 50</td>
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<tr>
<td>1-5 years</td>
<td>20-30</td>
<td>&gt; 40</td>
</tr>
<tr>
<td>&gt; 5 years</td>
<td>15-25</td>
<td>&gt; 30</td>
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Asthma: When to Worry!

RECOGNIZING TROUBLE

ASTHMA ATTACK

- Dyspneic & Increase Rate
- Chest Tightness
- Expiratory Wheezes
- Cough
- Use of Accessory Muscles
Enterovirus D68 (EV D68)

- Type of enterovirus spread through respiratory secretions
- Most of the other hundreds of types of enteroviruses are spread through the fecal-oral route
- As with all enteroviruses, EV D68 can cause many types of illnesses, such as respiratory, febrile rash, neurologic
- Produces various symptoms ranging from nonexistent to mild (similar to the common cold) to severe (respiratory illness causing hospitalization)
- No vaccine or Food and Drug Administration–approved antiviral medication is available for this enterovirus
Epiglotittis

• Acute inflammation of the epiglottis and surrounding area

• Life-threatening emergency that rapidly causes edema and induration

• If untreated, results in complete airway obstruction
  Mortality 8% to 12%, typically in children ages 2 to 8
  — Most common causes:
    — Bacterial infection, usually Haemophilus influenzae type B (Hib)
    — Pneumococci or group A streptococci

• Pathophysiology
  — An infection of the epiglottis and surrounding area leads to intense inflammation of the supraglottic region.
  — Swelling and inflammation of the epiglottis, aryepiglottic folds, false vocal cords, and supraglottic structures causes narrowing of the airway
Respiratory Distress

• Bronchiolitis
  – Most common causes
    – RSV
    – Metapneumovirus
    – Parainfluenzae I, III
    – Influenza
    – Adenovirus
  – Management techniques
    – IV Fluid
    – Oxygen
    – Suctioning
Bronchiolitis

- Hospitalization
- Rhinitis
- Fever
- Cough
- Rales/Wheeze
- Hypoxemia
- Apnea
- CXR Infiltrates

Days

0 5 10 15 20 25 30
Bronchiolitis - Key Clinical Pearls

• Symptom management is key - HYDRATION

• NO
  – Nebulizers
  – Steroids
  – Oxygen - unless their Pox is < 90%
  – Antibiotics - it is a virus
Pertussis

• Highly contagious bacterial respiratory infection
• Classic sign- paroxysmal or spasmodic coughing
• Can last for weeks

• Interventions:
  – Maintain airway
  – Bed rest
  – Mist tent/Steam
  – Antibiotics
Immunizations

From 6 to 16!
Pediatric Infections

- **Viral**
  - Fever
  - Petechiae
  - Neutropenic
  - Lymphocytic

- **Bacterial**
  - Leukocytosis
  - Neutropenia indicates “super infection”
  - Neutrophilic
  - Usually increase in CRP & ESR
Viral Infections in Pediatric Patients

• Viruses cause the most pediatric infections

• Viruses are often a predisposing factor for bacterial respiratory infections

• Some common childhood “red rashes” could be a viral illness
Infections in Neonates

• Common “work-up” in a Pediatric ED is a neonate for sepsis

• Neonates can “get sick fast”

• Important to do a full evaluation and monitor overnight majority of the time
  — CBC, ESR, CRP, Blood Culture, Urine Culture, Stool Culture and a Lumbar Puncture for CSF Culture
Common Pathogens in Neonatal Sepsis

- Group B Strep
  - Maternal to baby transmission is 1%
- E. Coli
- Listeria
- Staph Aureus
- Staph Epi

**MUST CONSIDER IMMUNIZATION STATUS**
Immunizations

• Hepatitis A/B
• Pertussis (DTaP & Tdap)
• Measles (MMR)
• Influenza
• HPV
Hepatitis A and B

• Both serious infections that can have long term liver complications

• Hepatitis A
  – Vaccine is recommended for all children at age 1 year

• Hepatitis B
  – Children and adolescents
    – Babies normally get 3 doses of hepatitis B vaccine
      – 1st Dose: Birth
      – 2nd Dose: 1-2 months of age
      – 3rd Dose: 6-18 months of age
    – Some babies might get 4 doses, for example, if a combination vaccine containing hepatitis B is used. (This is a single shot containing several vaccines) The extra dose is not harmful.
    – Anyone through 18 years of age who didn't get the vaccine when they were younger should also be vaccinated.
Pertussis

• Pertussis is a poorly controlled vaccine-preventable disease

• Outbreaks are becoming the new normal

• Adults need boosters

• DTaP versus Tdap
  – Childhood vaccine is called DTaP.
  – Whooping cough booster vaccine for adolescents and adults is called Tdap

• Tdap vaccine should be given to pregnant women
Measles

• Symptoms
  – Initial symptoms generally appear 10-12 days after exposure to this highly contagious virus

  – The disease usually begins with nasal congestion and cough, eye redness without discharge, and moderate fever (102 F-103 F)

  – The child will generally look sick, with decreased appetite and activity level

  – On the third or fourth day of the illness, a higher fever (104 F-105 F) develops and the child will develop a brown rash on the face, along the hairline, and behind the ears. The rash then spreads down the body to the thighs and feet. After approximately a week, the rash fades in the same pattern as it developed
Measles Is Still A Problem!

Measles Cases and Outbreaks
January 1 to November 29, 2014*†

610 Cases

20 Outbreaks

reported in 24 states: Alabama, California, Connecticut, Hawaii, Illinois, Indiana, Kansas, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, New Jersey, New Mexico, New York, Ohio, Oregon, Pennsylvania, Tennessee, Texas, Utah, Virginia, Washington, Wisconsin

representing 89% of reported cases this year

U.S. Measles Cases by Year

*Provisional data reported to CDC’s National Center for Immunization and Respiratory Diseases
†Updated once a month
Measles

• Majority of the people who got measles are unvaccinated

• Measles still common in many parts of the world including some countries in Europe, Asia, the Pacific and Africa

• Travelers with measles continue to bring the disease into the US

• Measles can spread when it reaches a community in the US where groups of people are unvaccinated
Question

- All of the following would be seen in a child with Measles except:
  - Koplik’s spots
  - Photophobia
  - Swelling of the parotid glands & painful swallowing
  - Maculopapular, red, pruritic rash
Influenza

• A
  – Standard-dose trivalent shot
  – Intradermal trivalent shot
  – Recombinant trivalent shot that is egg-free approved for people 18 years and older

• A & B
  – Quadrivalent flu shot
  – Quadrivalent nasal spray vaccine approved for people 2 through 49 years of age (recommended preferentially for healthy children 2 years through 8 years old)

**Everyone 6 months of age and older should get a flu vaccine every season.**
When is Tamiflu Used?

• Approved for use in children as young as 2 weeks of age with flu-like symptoms for no longer than 2 days

• Does NOT replace the influenza vaccine

• It is NOT preventative

• There is a fixed dosing regimen for patients 1 year and older according to weight categories

• Dosing for children younger than 1 year must be calculated for each patient based on their exact weight

• These children should receive 3 milligrams per kilogram twice daily for five days
HPV

• Recommended for preteen girls and boys at age 11 or 12 years.

• Reasons parents say “NO” include: lack of knowledge, don’t think adolescent needs, safety concerns with sexual activity

• HPV vaccines are given as a series of three shots over 6 months to protect against HPV infection and the health problems that HPV infection can cause

• Two vaccines (Cervarix and Gardasil) protect against cervical cancers in women

• One vaccine (Gardasil) also protects against genital warts and cancers of the anus, vagina and vulva. Both vaccines are available for females

• Only Gardasil is available for males
Urinary Tract Infections
Urinary Tract Infections

- A bacterial infection of the urinary tract which may include the kidneys, bladder and/or urethra
- Now the most common infection among children
- Goal of treatment is to prevent renal damage
- Upper Tract- Kidneys and ureters
- Lower Tract- Bladder and urethra
Urinary Tract Infections

• Age-specific presentation

• Newborns:
  – Jaundice, hypothermia, fever, vomiting, sepsis, FTT

• Infants/Preschoolers:
  – Diarrhea, vomiting, fever, FTT, foul smelling urine

• School age/Adolescents:
  – Fever, vomiting, foul smelling urine, abdominal pain, frequency, painful urination
UTI: Evaluation and Treatment

• Evaluation
  – PE (Are they stable, especially if neonate?)
  – UA
  – Urine Culture
  – Blood Culture
  – Radiologic Studies

• Treatment
  – Antibiotics (IV or PO)
  – Follow up urine cultures
  – Prophylactic Antibiotics
  – Education/ Prevention
Diagnosis of a UTI

• Infants- 24 months
  —A cath specimen is recommended – AAP Action Statement 1
  —A bagged specimen is not suitable for a urine collection especially in a febrile infant

• Toilet trained girls
  —Contamination associated with vaginal flora is common. Suggest having the child sit backwards on the toilet in order to spread the labia, wipe with soap and water, and catch a mid stream specimen

• Proper urine collection is key!
Diagnosis of a UTI

• Toilet trained circumcised boys
  – The urethral meatus and glans should be cleaned with soap and water and a midstream specimen obtained

• Toilet trained uncircumcised boys
  – The foreskin should be retracted in order to visualize the urethral meatus, the meatus should be cleansed, and a midstream specimen obtained
Urine Cultures and Urinalysis

• The gold standard to diagnose a UTI is based off a Urine Culture with sensitivities
  – AAP Action statement 1

• Urinalysis can not be a substitute for urine culture
  – A urinalysis may suggest infection (positive for leuks/ nitrates)
Interpreting Urine Cultures: 3 Key Components

• What organism is growing in the urine

• How much of that organism is growing

• What antibiotics are appropriate in the treatment
What Organism has Grown?
Common Urinary Pathogens

- Urine Pathogens
  - *E. coli*, *Proteus sp.*
  - *Enterococcus sp.*
  - *Pseudomonas sp.*
  - *Serratia sp.*
  - *Corynebacterium Urealyticum*
  - *Klebsiella sp.*
  - *Enterobacter sp.*
  - *Group B streptococci*
  - *Staphylococcus aureus*

- Common Contaminants
  - *Lactobacillus sp.*
  - *Corynebacterium sp.*
  - Coagulase-negative staphylococci
  - Alpha-hemolytic streptococci
How Many Colonies of that Organism Have Grown?

- Abnormal UA **AND** growth of a urinary pathogen

- Cath Specimen
  - Definite >50,000 cfu/ml
  - Possible >10,000 cfu/ml

- Clean-Catch Specimen
  - Definite >100,000 cfu/ml
  - Possible >50,000 cfu/ml
How Many Colonies of that Organism Have Grown?

- If multiple organisms have grown in a clean catch specimen or it is a low colony count, it is considered contaminated.
- The culture should be repeated if the child is symptomatic.
Treating Positive Culture Results

- Infants under 3 months
  - Parental antibiotics and hospitalization is recommended
  - Antibiotics begin immediately after the urine specimen is obtained
  - Once the urine culture is finalized, check the urine culture sensitivities to ensure the appropriate antibiotic regimen
Treating Positive Culture Results

• Febrile infants older than 3 months and children
  – Ill-appearing children should be treated immediately, obtain urine for culture prior to treatment when possible.

• IV vs PO
  – Consider initial IV treatment if:
    – Infants < 6 months of age
    – Moderate / Severe Dehydration
    – Vomiting, inability to tolerate oral fluids, antibiotics
    – Concern for follow-up
UTI: Management Goals

• Prompt identification of infection
• Accurate diagnosis
• Identify children at risk for renal damage
• Avoid overuse of antibiotics and unnecessary testing
UTI Contributing Factors

• A child’s voiding habits can contribute to the development of a UTI

• It is essential to assess and document the child’s voiding regimen and pattern

• Infrequent voiding and incomplete emptying can play a role in the cause of a UTI

• Constipation is a large culprit in UTI
Autism in Primary Care
Autism

- Characterized by severe and pervasive impairment in reciprocal social interaction and communication skills

- Restricted and repetitive behaviors

- At a young age fascinated by objects that spin, reflect light, sparkle or are smooth

- Performs repetitive movements such as rocking

- Appear hyperactive
Learning Disabilities
Learning Disabilities

• Affect one’s ability to process and use information
• Must have a normal IQ
• Deficits
  – Visual
  – Sensory
  – Perceptual
  – Auditory
  – Tactile
  – Motor / Expressive
ADHD
ADHD

• Thought to be a dysregulation of neurotransmitters
• Affects decision making and attention
• Genetic predisposition-50%
• Does not affect one’s ability to learn but affects the availability for learning to occur
• Symptoms must be present for greater than 6 months and before age 7
• Symptoms must be present in 2 different settings
ADHD Interventions

• Medications - psychostimulants to increase focus and attention

• Behavioral / Environmental strategies
  – Identifying child’s strengths
  – Clear simple rules
  – Consistent routines
  – Uncluttered environment
  – Reduce stimulation
Question

• The father of your adolescent patient is upset because he has been prescribed stimulants for ADHD and the father believes the child is being “drugged.”

• How do you respond?
Obesity
Obesity Fast Facts

• Childhood obesity has more than doubled in children and quadrupled in adolescents in the past 30 years.

• The percentage of children aged 6–11 years in the United States who were obese increased from 7% in 1980 to nearly 18% in 2012. Similarly, the percentage of adolescents aged 12–19 years who were obese increased from 5% to nearly 21% over the same period.

• In 2012, more than one third of children and adolescents were overweight or obese.
Obesity Management Techniques

• Start a weight-management program

• Change eating habits
  – Eat slowly, develop a routine

• Plan meals and make better food selections
  – Eat less fatty foods, avoid junk and fast foods

• Control portions and consume less calories

• Increase physical activity (especially walking) and have a more active lifestyle

• Know what your child eats at school

• Eat meals as a family
  – Instead of while watching television or at the computer

• Do not use food as a reward

• Limit snacking
Cleveland Clinic

Every life deserves world class care.