Advanced Topics in Pediatrics Syllabus

Week 1
- **Asthma**
- **Respiratory Distress**
- **Gastrointestinal Bleed**

Week 2
- **Seizures**
- **Diabetes and DKA**
- **Meningitis, Encephalitis, and Altered Mental Status**

Week 3
- **Neonatal Fever**
- **Acute Kidney Injury**
- **Anemia**

Week 4
- **Child with a Limp**
- **Child Abuse**
- **Care of Medically Complex Children**
Week 1: Asthma

Readings
1. Dexamethasone for Acute Asthma Exacerbations in Children: A Meta-Analysis¹
2. Outcomes for Pediatric Asthmatic Inpatients After Implementation of an Emergency Department Dexamethasone Treatment Protocol²
3. Randomized trial of dexamethasone versus prednisone for children with acute asthma exacerbations: Why?³
5. NHLBI Asthma Guidelines⁵

Podcast
1. Pediatric Asthma, Peds in a Pod⁶

Video
1. Status Asthmaticus⁷

Discussion Questions
1. What are the pros and cons of nebulizer versus inhaler? What’s the youngest a child can use an inhaler? Which is better?
2. What does the data show for use of dexamethasone instead of prednisone for acute asthma exacerbations? What is the controversy in using dexamethasone? In what settings has it been shown to work and in what settings has its benefit, or non-inferiority, not yet been proven?
3. What is the difference between an MDI and a DPI? What limits the use of a DPI?
Week 1: Respiratory Distress

Readings
1. Respiratory Distress in Pediatric Patients
2. Clinical Practice Guideline: The Diagnosis, Management, and Prevention of Bronchiolitis
3. Bronchiolitis Management Before and After the AAP Guidelines

Videos
1. Introduction to Pediatric Chest Radiography
2. Back to Basics: Pediatric Respiratory Distress
3. Recognizing Respiratory Distress
4. Common Pediatric Respiratory Problems
5. PM Pediatrics Video Prescription: Respiratory Distress from 0:45-1:00
6. Emergency Room: Severe Respiratory Distress, Retractions, and Auscultation Sounds

Discussion Questions
1. What are the indications for use of high flow nasal cannula in bronchiolitis? Is it a proven benefit?
2. What are some of the signs of impending respiratory failure? What are some options for management of respiratory failure?
3. What treatment options for croup, and indications for these? What are indications for admission?
**Week 1: Gastrointestinal Bleed**

**Readings**
1. Gastrointestinal Bleeding\(^{17}\)
2. Clinical characteristics of Meckel diverticulum in children: A retrospective review of a 15-year single-center experience\(^{18}\)

**Videos**
1. Pediatric Inflammatory Bowel Disease: Updates for primary care providers\(^{19}\)
2. Ostomy Pouching for Children\(^{20}\)
3. Practical Management of Infants with Milk Protein Allergy\(^{21}\)

**Radiology Resource**
1. [https://www.med-ed.virginia.edu/courses/rad/peds/abdominal1.html](https://www.med-ed.virginia.edu/courses/rad/peds/abdominal1.html)\(^{22}\)
   Please review the following modules:
   - Necrotizing enterocolitis
   - Midgut volvulus
   - Meckel’s Diverticulum
   - Intussusception

**Discussion Questions**
1. Discuss different treatment options for pediatric IBD including medical and surgical options.
2. There are many different formulas on the market. Discuss some of the formulas that can patients with milk protein allergy can safely consume, and what makes them safe compared to standard formulas.
3. What are some causes of upper vs. lower GI bleeding, and how would your diagnostic considerations differ between these two groups?
Week 2: Seizures

Readings
1. The evolution of the concepts of seizures and epilepsy: What's in a name?23

Podcast
1. Seizures and spells25

Online lectures
1. Febrile seizures26
2. Treatment of medication resistant epilepsy27
3. Pediatric Status epilepticus management28

Videos
   If the videos don’t display, use these links that correspond to videos 1, 2, 4, and 5 on the above page (read the descriptions on the page above):
   Infantile spasms video 130
   Infantile spasms video 231
   Infantile spasms video 332
   Infantile spasms video 433

Discussion Questions:
1. What are some non-medication based treatment options for epilepsy, and discuss the mechanisms by which these therapies help patients.
2. You are the pediatric night team intern, and a rapid response is called on your patient. You get to the room and the patient is having a seizure. Describe the steps you would take to stabilize the situation (exam, interventions, medications, etc). What red flags would have to exist in the scenario that would make you consider calling the PICU for additional assistance?
3. Describe some of the challenges of caring for a patient with PNES (psychogenic non epileptic seizures), and what therapies are effective for these patients.
**Week 2: Diabetes / DKA**

**Readings**
1. Improving Emergency Department Management of Diabetic Ketoacidosis in Children
2. A Quality Improvement Initiative to Reduce Hospitalizations for Low-risk Diabetic Ketoacidosis
3. Diabetic Ketoacidosis

**Videos**
1. Diaz and her insulin pump
2. Coping with Type 1 Diabetes Diagnosis

**Discussion Questions:**
1. Electrolyte abnormalities are common during DKA management. Which electrolyte abnormalities are commonly seen initially when patients present to the ER, and how should they be managed? What electrolyte abnormalities can develop over the course of the treatment, and how can they be prevented?
2. What are some of the advantages and disadvantages of using an insulin pump to treat diabetes as opposed to traditional subcutaneous insulin?
3. What are some of the “red flags” that can suggest a patient is developing diabetes that PCPs should be on the lookout for?
Week 2: Meningitis, Encephalitis, and Altered Mental Status

Readings
1. Meningitis
2. Choice and Duration of Antimicrobial Therapy for Neonatal Sepsis and Meningitis
3. Clinical approach to the diagnosis of autoimmune encephalitis in the pediatric patient
4. Case 4: Altered Mental Status in a 6-year-old Boy

Optional Reading
1. Encephalitis

Videos
1. Altered Mental Status: A Brief Didactic Video (another link to same video)
2. Overview of Meningitis and Encephalitis
3. Bacterial Meningitis Treatment and Prevention

Discussion questions
1. What is the difference between meningitis and encephalitis, both in pathophysiology and presentation?
2. When should you suspect autoimmune encephalitis? What is the workup for this?
3. How does the differential diagnosis of altered mental status differ in an infant compared to a school-aged child or a teenager?
Week 3: Neonatal Fever

Readings
1. The Febrile Infant: Where Art Meets Science to Prevent Harm
2. Time to Detection of Bacterial Cultures in Infants Aged 0 to 90 Days
3. Clinical Prediction Rule to Identify Febrile Infants 60 Days and Younger at Low Risk for Serious Bacterial Infections

Podcast
1. Pediatric Fever, CrackCast

Videos
2. Lumbar Puncture, NEJM
3. Pediatric Lumbar Puncture- Septic Workup

Discussion questions
1. At what age is there minimal controversy in workup of fever in an infant? What is that workup?
2. What are a few of the classical criteria for evaluating neonatal fever? What are some of the newer criteria? Why is there constant searching for new evaluation methods and criteria to evaluate neonatal fever?
3. What are the sequelae of neonatal meningitis?
4. Explain how you would consent a parent for a lumbar puncture.
Week 3: Acute Kidney Injury

Readings
1. Meta-Analysis: Urinary Calprotectin for Discrimination of Intrinsic and Prerenal Acute Kidney Injury\textsuperscript{54}
2. Nephrotoxins and nephrotoxic acute kidney injury\textsuperscript{55}
3. Hemolytic-uremic syndrome\textsuperscript{56}

Videos
1. Teens and Kidney Dialysis\textsuperscript{57}
2. A Day with Darby: Living Life with Dialysis\textsuperscript{58}

Discussion Questions
1. What are some commonly prescribed pediatric medications that can cause AKI? How can this be prevented?
2. Discuss diagnostic tests, both serum and urinary, that can help differentiate types of AKI, and how they are interpreted?
3. Why is hemolytic uremic syndrome so dangerous? Discuss some of the complications that can occur as a result of this condition.
Week 3: Anemia

Readings
1. Pediatric ITP: is it different from adult ITP?\textsuperscript{59}
2. Emerging disease-modifying therapies for sickle cell disease\textsuperscript{60}
3. Anemia in Childhood\textsuperscript{61}

Video
1. Sickle Cell Anemia: A Patient’s Journey\textsuperscript{62}

Discussion Questions
1. Discuss the most common causes of microcytic anemia in pediatrics, and how to differentiate between them using history and lab results.
2. What are some of the challenges patients experience living with sickle cell disease?
3. You are ordering a blood transfusion for a patient. What are the risks of blood transfusions that you would discuss with the patient’s family during the consent process? What dose/volume of blood is typically transfused in pediatrics? About how many mLs are in 1 unit of pRBCs?
Week 4: Child with a Limp

Readings
1. The Limping Child, Pediatric Clinics of North America
2. The Limping Child, Pediatrics in Review

Podcast
1. Acute hematogenous osteomyelitis

Videos
1. Pediatric Update for the Knee-ky Radiologist

Discussion Questions
1. You are seeing a limping toddler in clinic. What are some of the “red flags” you would watch out for that, if present, would cause you to send the patient to the ER for additional evaluation?
2. What are the most common bacterial causes of septic arthritis and osteomyelitis? Which antibiotic(s) would you empirically start for treatment of these conditions, prior to culture results being available?
3. What are some of the imaging modalities that can be considered for evaluation of a limping child, and when would you choose one over another?
Week 4: Child Abuse

Readings
1. Physical Abuse of Children
2. Managing Child Abuse: General Principles
3. Reporting Child Abuse: Embracing Uncertainty

Podcast
1. Non Accidental Trauma

Videos
2. Child has been abused

Optional additional readings
1. Blunt Abdominal Trauma
2. Child Sexual Abuse
3. Abusive Head Trauma in Infants and Children

Optional Podcasts
1. Orthopedic Injuries in NAT
2. Bounceback 1: Bloody Emesis

Discussion questions
1. What are the major risk factors for child abuse?
2. What are some of the different common presentations of child abuse that differ by age of the patient?
3. If non-accidental trauma is suspected based on an initial presentation, what are some of the supporting features you could look for?
Week 4: Care of Medically Complex Children

Readings
1. Health Supervision for Children With Down Syndrome
2. Down Syndrome

Presentations
1. G-tube basics
2. Feeding Tubes. There are two ways to view this; as a voice-guided presentation, or as a non audio powerpoint with accompanying guide.
3. Ventriculoperitoneal Shunts. There are two ways to view this; as a voice-guided presentation, or as a non audio powerpoint with accompanying guide.

Videos
1. Understanding Feeding Tubes
2. Tracheostomy Primer
3. How to Do a Routine Trach Change
4. How to Do an Emergency Trach Change
5. Cerebral Palsy
6. Cerebral Palsy: The Basics

Blog
1. What it’s Like to be a Mom to a Tubie

Discussion questions
1. What are the most common comorbidities or complications associated with Down syndrome? What are the major difficulties encountered in infancy?
2. What are some of the tools and resources available for primary care doctors in caring for children with Down syndrome?
3. What are the important details to know/document about a feeding tube? Tracheostomy?
4. In what situations are a gastric tube permanent? Temporary?
8 Agbim CA, Wand NE, Lee M. Respiratory Distress in Pediatric Patients. Pediatric Emergency Medicine Reports. April 2018

Back to index
60 Carden MA, Little J. Emerging disease-modifying therapies for sickle cell disease. Haematologica. 2019;104(9):1710-1719
79 Barfchin S. G-tube Basics.
83 Cincinnati Children’s. Wolter N. Tracheostomy Primer. Youtube. OPENPediatrics. 2017 https://www.youtube.com/watch?v=0qq-y0t4qj4
86 Hasudungan A. Cerebral Palsy – (DETAILED) Overview. Youtube. 2017

Back to index
https://www.youtube.com/watch?v=7fUGWKM32hE
https://youtu.be/MlhgsM1Sbck
88 Sneed K. What It’s Like To Be A Mom To A Tubie. Singing Through The Rain Blog. 2014
https://singingthroughtherain.net/2014/05/like-tubie-mom.html#_a5y_p=3347737