1. I Have a Tummy Ache!
   - The Evaluation of Abdominal Pain in the School-Aged Child

2. Abdominal Pain

3. Abdominal Pain
   - Medical Evaluation
     - Detailed History, Child and Parent
       - Child’s age and general health
       - Location, duration, quality
       - Associated symptoms
     - Full Physical Exam
     - Laboratory and X-ray
     - Subspecialist Consultation

4. Abdominal Pain
   - School Nurse Evaluation
     - History (probably only from child)
       - Child’s age and general health
       - Location, duration, quality
       - Associated symptoms
     - Limited Physical Exam
     - OK vs Not OK?
     - Back to Class? Call Mom? EMS?

5. Abdominal Pain

6. Case 1
   - 8 year old girl with many missed school days and frequent visits to nurse’s office for stomachache
   - Pain is always central, indicated by holding her hand over mid-belly
   - T 98.4, HR 80, RR 16, BP 110/65
   - Usually feels somewhat better after lying down in office for awhile, returns to class

7. RAP
   - Recurrent Abdominal Pain
     - Peak 8–10 years, more often girls
     - “Overachievers”, anxious, worried
     - Generally no other symptoms referable to abdomen except pain
     - Vital signs, physical findings, growth and health are normal
     - No nighttime symptoms
     - Tends to worsen over time in a “Mind–Body Viscious Cycle”

8. Medical Evaluation
   - Diagnosis of EXCLUSION
     - No organic cause 90–95% of RAP
• UTI, constipation, malabsorption, dyspepsia, lead, others

• Treatment
  • Pain is Real but not Dangerous
  • Psychosocial Approach
  • Encourage School Attendance

9 Case 2
• 11 year old usually healthy boy
• Sent to nurse in morning for stomach ache since last night
• T 99.8, HR 90, RR 18, BP 105/75
• Points to belly, feels better after lying down, goes back to class
• Returns after lunch, didn’t eat, vomited, holding right lower side
• T 101.4 HR 124 RR 18 BP 138/90

10 Appendicitis
• Lifetime Incidence 6/100
• Most common in teenagers
• Obstruction, inflammation, infection of the appendix
• Symptom progression
  • Vague central pain
  • Nausea/vomiting, fever, anorexia
  • Right lower quadrant pain

11 Appendicitis
• Medical Evaluation
  • CBC, other abdominal labs
  • X-rays of abdomen and chest
  • Ultrasound or CT
• Treatment
  • Surgical removal of appendix

12 Case 3
• 7 year old girl vomits in class
• Holds hand over middle of belly
• T 100, HR 100, RR 16, BP 105/65
• Vomits more in nurses office then has some yellow watery diarrhea
• Call home, mom reports 3 year old brother sent home from daycare with vomiting and fever

13 Gastroenteritis
• Most commonly viral etiology
  • Rotavirus, Adenovirus, Norwalk
• Symptom progression
  • Nausea and vomiting
  • Crampy diffuse abdominal pain
  • Fever
  • Diarrhea

14 Gastroenteritis
Medical Evaluation
- Assessment of hydration status
- Occult blood (guaiac) stool

Treatment
- Supportive care – no medicine
- IV fluids if dehydrated

15 Case 4
- 14 year old healthy boy
- Comes to nurse’s office with left lower abdominal pain
- When asked to point to where pain is, just states “down there”
- T 98.6, HR 120, RR 16, BP 158/90
- Looks extremely anxious and uncomfortable

16 Testicular Torsion
- Incidence 1/4000
- Peak in teenagers, average 14
- Testicle rotates on spermatic cord, cutting of blood supply
- Symptom progression
  - Vague unilateral aching
  - May perceive as abdominal pain
  - Rapid development of severe pain and swelling within hours

17 Testicular Torsion
- Medical Evaluation
  - Examination of testicle
    - Epididymitis, Torsed appendix testis, trauma
  - Ultrasound
- Treatment
  - Surgical detorsion
  - 80–100% success if operated early

18 Case 5
- Kindergartener back to school after viral illness last week
- Sent to nurse with intermittent bouts of agonizing pain in class
- Pain seems to be RLQ, belly very tender, tense, slightly distended
- Alternates with listlessness
- T 99, HR 133, RR 22, BP 85/45
- Vomits and passes a jelly like bloody stool in the nurses office

19 Intussusception
- “Telescoping” of intestine into itself, often ileocecal
- Age 6 months to 6 years
- Incidence 1/1000
- Symptom progression
  - Intermittent bouts of excruciating pain
  - Often listless inbetween
  - Abdominal distension
• “Currant Jelly” stool

20 Intussusception
• Medical Evaluation
  • Blood and Urine Labwork
    • Abdominal vs ? Neuro
  • Radiology
    • X-rays often inconclusive
    • Ultrasound
• Treatment
  • High pressure contrast enema
  • Surgery

21 Case 6
• 13 year old well developed girl repeat visits to nurses office every 3–4 weeks for worsening pain
• Severe crampy bilateral lower abdominal pain
• States it’s not cramps since she hasn’t started menstruating
• T 98.8, Pulse 128, RR 16, BP 100/60

22 Imperforate Hymen
• Congenital abnormality often not recognized until adolescence
• Symptom progression
  • Cyclical severe pelvic pain, worsens with each passing month
  • Urinary pressure
  • Constipation
  • Lack of menses despite other appropriate pubertal development

23 Imperforate Hymen
• Medical Evaluation
  • Pregnancy Test!!
  • Vaginal or Pelvic exam
    • Bulging bluish mass at introitus
  • Pelvic Ultrasound
• Treatment
  • Surgical hymenotomy by OB/Gyn

24 Case 7
• 8 year old girl sent to nurses office second time this week because of cough and cold symptoms
• T 104.9, HR 130, RR 60, BP 120/70
• Complains of RLQ abdominal pain
• Frequent wet cough and rapid labored breathing

25 Pneumonia
• Localized infection of the lungs
• Often follows common cold virus
• Symptom progression
  • Common cold symptoms
• Sudden high fever
• Increasing cough
• Breathing difficulty
• Abdominal pain if lower lobes

26 **Pneumonia**

• Medical Evaluation
  • Chest exam for localizing findings
  • CBC, blood cultures
  • X-rays
    • May be discovered on CXR during evaluation of abdominal pain
• Treat with antibiotics, PO or IV

27 **Case 8**

• 10 year old girl sent to office for abdominal cramps
• Diffuse pain all over
• T 104.4, HR 130, RR 18, BP 110/65
• Passes grossly bloody and mucus filled diarrhea

28 **Bacterial Enteritis**

• Salmonella, shigella, Yersinia, Campylobacter, E. Coli
• Symptom progression
  • Abrupt onset of fever, chills, abdominal cramps
  • Diarrhea often grossly bloody or with visible mucus
• Systemic complications
  • Seizures, arthritis, HUS

29 **Bacterial Enteritis**

• Medical Evaluation
  • CBC, Electrolytes
  • Fecal WBCs and culture
• Treatment
  • IV Fluids if dehydrated
  • Antibiotics based on culture results or current epidemiology

30 **Case 9**

• 9 year old boy with repeated visits to nurse’s office for tummyache
• Usually occurs in the afternoon, complains of pain on left side
• T 99, HR 90, RR 16, BP 135/70
• Chubby kid with tender LUQ and LLQ with firm mass palpable
• Smells kind of poopy

31 **Encopresis**

• Soiling with stool after toilet trained
• 1–2% of kids under 10, 80% are boys
• Symptom progression
  • Constipation, Stool Withholding
    • Painful BMs, embarrassed at school
  • Colon stretches (megacolon)
• Loss of normal sensation and tone
• Surprise!

32 Encopresis
• Medical Evaluation
  • Check rectal tone
  • X-rays
• Treatment
  • Initial Cleanout Phase
    • Enemas, Laxatives
  • Maintenance Phase
    • Stool softeners, diet
    • Poop schedule, retraining, privacy

33 Case 10
• 6 year old girl brought from class doubled over with abdominal pain
• Holding stomach, vomiting, confused and listless, feels hot but clammy
• T 104.9, HR 155, RR 32, BP 78/30
• Evolving purple spots on arms and lower legs

34 Meningococcemia
• Rapidly progressing, life-threatening bacterial bloodstream infection
• Neisseria Meningiditis may cause meningitis, but more dangerous when it does not
• Symptom progression (FAST!!)
  • Fever, lethargy
  • Vomiting, abdominal pain
  • Purpuric rash

35 Meningococcemia
• Medical Evaluation
  • CBC, blood culture, Spinal tap, stains and cultures of rash
• Treatment
  • ABCs, fluids, pressor support
  • IV antibiotics
  • Prophylaxis for household contacts and prolonged face-to-face contact

36 Case 11
• 7 year old girl vomits in class
• Holds hand over right upper belly, skin and eyes look yellowish
• T 100, HR 110, RR 18, BP 110/75
• Vomits more in nurses office then has some diarrhea
• Call home, mom reports 3 year old brother sent home from daycare with vomiting and fever

37 Hepatitis A
• Most cases (30%) are in children
• Fecal–oral transmission
• Often virtually indistinguishable from viral gastroenteritis
• Symptom progression
  • Nausea and vomiting
  • RUQ Pain
  • Fever
  • Jaundice
  • Diarrhea

38 Hepatitis A
• Medical Evaluation
  • Assessment of hydration status
  • Liver functions, Hepatitis serology
• Treatment
  • Supportive care – no medicine
  • IV fluids if dehydrated
  • Vaccine and/or Hep A Ig for close contacts

39 Case 12
• 16 year old girl told friends she has severe abdominal pain all day, then passes out in hall
• Comes to in nurse’s office, still having severe LLQ pain
• T 98, HR 140, RR 16, BP 95/55
• Confides she hasn’t had a period in 3 months but is bleeding today

40 Ectopic Pregnancy
• Fertilization and implantation in Fallopian tube or abdomen
• Symptom progression
  • Missed period, other symptoms of pregnancy for 3–12 weeks
  • Severe One-sided lower quadrant or pelvic pain
  • Vaginal bleeding

41 Ectopic Pregnancy
• Medical Evaluation
  • Female Abdominal Pain – Big Net
  • B–HCG
  • Ultrasound
• Treatment
  • Methotrexate if early pregnancy
  • Surgical Removal

42 Case 13
• 7 year old boy arrives to nurse’s office with stomach cramps
• Holds hand over mid belly
• T 98.8, HR 90, RR 16, BP 115/65
• Calls you into bathroom because his pee looks reddish brown
• You notice purple bruises up and down legs and buttocks

43 Multisystem autoimmune vasculitis
• Symptom progression
• Slowly progressing purpuric rash mostly on legs and buttocks in generally well-appearing child
• Hematuria
• Joint pains or swelling
• Colicky abdominal pain with increased risk of intussusception

44 Medical Evaluation
• Diagnosis of EXCLUSION
• CBC, UA, ESR, IgA levels
• Treatment
  • Supportive care, pain relief
  • Steroids for severe abdominal pain
  • Monitor hematuria and renal function

45 Case 14
• 15 year old boy you saw a few weeks back with sore throat carried in from soccer practice
• Kicked in abdomen complains of pain in left upper abdomen
• T 98.6, HR 140, RR 20, BP 90/40
• Tender LUQ with bruising, slight distension, feels lightheaded

46 Blunt Trauma
• A leading cause of morbidity and mortality across all age groups
• Splenic rupture, hepatic laceration, pancreatic contusion, intestinal rupture, renal hematoma...
• Risk of splenic rupture increased about 2 weeks into infectious mononucleosis

47 Blunt Trauma
• Medical Evaluation
  • ABCs, fluids, blood
  • Diagnostic Peritoneal Lavage
  • CT Scan
• Treatment
  • Almost always surgical for serious injuries

48 Red Flags
• Localized Pain away from umbilicus
• Severe Tenderness or Distension
• Vital sign abnormalities
• High Fever
• Lethargy
• Hematuria
• Bloody Stool or Vomit
• Purpuric Rash
• Pelvic Pain with menstrual irregularity

I Have a Tummy Ache!
• The Evaluation of Abdominal Pain in