

## 2010 LLSA Review

Mary Ann Edens, MD, FACEP  
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## Does This Child Have Appendicitis?

- Abdominal pain on most common presenting symptoms in children
  - Appendicitis most frequent surgical etiology
  - Accounts for 77,000 pediatric discharges/year

## Does This Child Have Appendicitis?

- 1/3 of children with appendicitis have rupture before operative treatment
  - Particular risk in preverbal children
- Missed appendicitis second most common diagnosis in pediatric malpractice cases
  - Missed meningitis is first

## Does This Child Have Appendicitis?

- Rare in neonates
  - Funnel shaped appendix
  - Soft diet
  - Recumbent position
  - When occurs, high mortality rate
    - 28%-64%
- Around age 1-2, appendix assumes adult shape

## Does This Child Have Appendicitis?

- This article reviewed 42 studies with data on children with appendicitis
  - Looked at sensitivity and specificity of signs, symptoms and lab tests

## Does This Child Have Appendicitis?

- Accuracy of symptoms
  - Pain – universal finding
    - Duration did not affect likelihood
  - Fever
    - Only had higher likelihood ratio in one study
  - Vomiting and diarrhea
    - Mixed results

## Does This Child Have Appendicitis?

- Accuracy of signs
  - Localized abdominal tenderness
    - Not helpful in predicting appendicitis
  - Rebound tenderness
    - Most useful sign
    - Presence tripled likelihood of appendicitis
    - Absence decreased odds

## Does This Child Have Appendicitis?

- Accuracy of signs
  - Rectal tenderness and psoas sign
    - Presence increased likelihood of appendicitis
    - But absence, wasn't useful

## Does This Child Have Appendicitis?

- Accuracy of laboratory studies
  - WBC count
    - Age specific limits did increase likelihood ratios
  - CRP
    - Mixed results for consistency, but may be useful

## Does This Child Have Appendicitis?

- Suggestion was made that the best tool was clinical gestalt
  - If physician thought child had appendicitis, child probably had appendicitis

## Diverticulitis

- Diverticular disease accounts for 130,000 hospitalizations/year in US
  - Prevalence equal in men and women
  - Incidence increases with age
  - Common cause of acute lower GI bleeding

## Diverticulitis

- Risk factors for diverticular disease
  - Diets low in fiber and high in refined carbohydrates
  - Physical inactivity
  - Constipation
  - Obesity
  - Smoking
  - Treatment with NSAIDs

## Diverticulitis

- Diverticulitis indicates inflammation
- Pathogenesis uncertain
  - Stasis or obstruction may lead to bacterial overgrowth and tissue ischemia
  - Anaerobes are the most commonly isolated organisms

## Diverticulitis

- Complicated diverticulitis
  - Abscess or phlegmon
  - Fistula formation
  - Stricture or bowel obstruction
  - Peritonitis
  - Free perforation
    - Late event

## Diverticulitis

- Classic presentation
  - Obstipation
  - Abdominal pain localized to LLQ
  - Abdominal or perirectal fullness
  - Low grade fever
  - Leukocytosis

## Diverticulitis

- Imaging
  - CT recommended as initial exam
    - High sensitivity and specificity
    - Allow delineation of extent of process
  - Colonoscopy and sigmoidoscopy typically avoided
    - Risk of perforation or exacerbation

## Diverticulitis

- Treatment
  - Most patients can be treated as outpatient with broad spectrum oral antibiotics
  - Hospitalize if
    - Cannot tolerate po
    - Pain severe enough to require narcotics
    - Failure of outpatient treatment
    - Complicated diverticulitis

## Diverticulitis

- Treatment
  - Percutaneous drainage
    - Most patients can be treated without drainage if abscess is small
    - With abscess > 4 cm, CT guided drainage may be useful

## Diverticulitis

- Treatment
  - Emergent surgical intervention
    - Generalized peritonitis
    - Uncontrolled sepsis
    - Uncontrolled visceral perforation
    - Presence of large undrainable abscess
    - Lack of improvement within 3 days of medical management

## Do Opiates Affect the Clinical Evaluation of Patients with Acute Abdominal Pain?

- Article looked at 3 questions
  - Does use of opiates alter history given by patient?
  - Does use of opiates alter physical exam findings?
  - Does use of opiates result in errors in medical management?

## Do Opiates Affect the Clinical Evaluation of Patients with Acute Abdominal Pain?

- Does use of opiates alter history given by patient?
  - None of the studies addressed this directly, but 5 studies addressed blinding
    - All showed adequate blinding
    - Provides some indication that opiates should not alter history

## Do Opiates Affect the Clinical Evaluation of Patients with Acute Abdominal Pain?

- Does use of opiates alter physical exam findings?
  - Studies showed that there was a trend toward changes in the physical exam with opiate use

## Do Opiates Affect the Clinical Evaluation of Patients with Acute Abdominal Pain?

- Does use of opiates result in errors in medical management?
  - Studies showed no significant change in rate of incorrect management
- Bottom line
  - Use opiates for pain management in abdominal pain

## Paracentesis

- Indications
  - New onset ascites with uncertain etiology
  - Suspected spontaneous bacterial peritonitis
  - To decrease the volume of ascites

## Paracentesis

- Contraindications
  - DIC – absolute contraindication
  - Use with caution in patients with
    - Pregnancy
    - Organomegaly
    - Bowel obstruction
    - Adhesions
    - Distended bladder

## Paracentesis

- Contraindications
  - Avoid areas of
    - Cutaneous infection
    - Engorged vessels
    - Surgical scars
    - Abdominal wall hematomas

## Paracentesis

- Preparation
  - Use of bedside US may be useful to find best location for needle insertion

## Paracentesis

- Analysis of fluid
  - Diagnosis of SBP suggested by PMN count  $>250$  cells/mm<sup>3</sup> in absence of alternative source of infection
    - Viscous perforation
    - Intraabdominal abscess
  - Complications are rare

## Assessment of Patient's Competence to Consent to Treatment

- Required by law and medical ethics to obtain informed consent for treatment
- While competency is a legal issue, physicians often have to determine if individuals have the capacity to make decisions

## Assessment of Patient's Competence to Consent to Treatment

- Any diagnosis or treatment that compromises mentation may be associated with incompetence
- But no diagnosis in which consciousness is retained invariably predicts incompetence
  - Dementia
  - Mental illness

### Assessment of Patient's Competence to Consent to Treatment

- In psychiatric conditions, the lack of insight is the strongest predictor of incapacity
- Physicians are frequently unaware of patient's incapacity

### Assessment of Patient's Competence to Consent to Treatment

- Approaches to assessment
  - Psychiatric consult may be useful
  - Mini-mental State Examination has been found to correlate with clinical judgments of incapacity
    - No single cutoff seen, but score < 19 suggestive of incompetence and score > 23-26 suggestive of competence

### Assessment of Patient's Competence to Consent to Treatment

- When physician determines patient incompetent, unless urgency precludes, should identify causes of impairment and try to rectify them
  - Doing so may lead to patient regaining competence

### Assessment of Patient's Competence to Consent to Treatment

- If competence cannot be regained, a secondary decision maker should be sought
  - Many states have legal order
  - Disagreements among secondary decision makers can often be resolved through assembly and clarification of the situation

### Presentation and Management of Common Post-Weight Loss Surgery Problems in the Emergency Department

- Vertical banded gastroplasty
  - Procedure
    - Small pouch made along lower curvature of stomach using staples
    - Nonadjustable band constricts outlet

### Presentation and Management of Common Post-Weight Loss Surgery Problems in the Emergency Department

- Vertical banded gastroplasty
  - Complications
    - Surgical site infection
    - Bowel obstruction
    - Usually not at risk of metabolic complications
  - Rarely performed now with advent of laparoscopic procedures



Presentation and Management of  
Common Post-Weight Loss Surgery  
Problems in the Emergency Department

- Laparoscopic adjustable gastric banding
  - Procedure
    - Band placed around upper stomach
    - Connected to port under skin that allows for inflation and deflation



Presentation and Management of  
Common Post-Weight Loss Surgery  
Problems in the Emergency Department

- Laparoscopic adjustable gastric banding
  - Complications
    - Breakage
    - Infection
    - Erosion of band into GI tract



Presentation and Management of  
Common Post-Weight Loss Surgery  
Problems in the Emergency Department

- Laparoscopic adjustable gastric banding
  - Complications
    - Migration or slippage
      - Results in gastric dilatation and food intolerance
      - May occur remote from surgery
      - Treat by deflating band and surgical consultation



Presentation and Management of  
Common Post-Weight Loss Surgery  
Problems in the Emergency Department

- Roux-en-Y gastric bypass
  - Procedure
    - Small gastric pouch created
    - Connected to small intestine, bypassing some of intestine



Presentation and Management of  
Common Post-Weight Loss Surgery  
Problems in the Emergency Department

- Roux-en-Y gastric bypass
  - Complications
    - Anastomotic leak
    - Obstruction of Roux limb
      - Leads to gastric dilatation
    - Internal hernias
      - Small bowel herniates through mesenteric defect



Presentation and Management of  
Common Post-Weight Loss Surgery  
Problems in the Emergency Department

- Roux-en-Y gastric bypass
  - Complications
    - Nutritional deficiencies
      - Iron
      - Vitamin B12
      - Vitamin D
      - Calcium

### Presentation and Management of Common Post-Weight Loss Surgery Problems in the Emergency Department

- Biliopancreatic diversion
  - Procedure
    - Reduces size of stomach and completely bypasses the duodenum and jejunum
  - Complications
    - Similar to Roux-en-Y bypass
    - Higher rate of metabolic abnormalities

### Disclosing Harmful Medical Errors to Patients

- Physicians appear to want to disclose errors
  - Concern for litigation
  - Embarrassment and unsure of how to effectively discuss the error

### Disclosing Harmful Medical Errors to Patients

- Joint Commission requires patients be informed of all outcomes of case, including unanticipated ones
- Disclosure is considered part of patient care, not risk management

### Disclosing Harmful Medical Errors to Patients

- Basic content of disclosure includes
  - Expression of regret for unanticipated outcome
  - Apology if an error played a role
- Disclosure may decrease some patient's interest in litigation, but may ignite interest in others

### A Randomized, Controlled Trial Comparing Long-term Cosmetic Outcomes of Traumatic Pediatric Lacerations Repaired with Absorbable Plain Gut versus Nonabsorbable Nylon Sutures

- This study compared the use of absorbable vs. nonabsorbable sutures
  - Rates of infection
  - Rates of wound dehiscence
  - Cosmetic results
- No differences in short-term or long-term outcomes between sutures

### A Randomized, Controlled Trial Comparing Long-term Cosmetic Outcomes of Traumatic Pediatric Lacerations Repaired with Absorbable Plain Gut versus Nonabsorbable Nylon Sutures

- Absorbable felt to be better because
  - Able to avoid cost of follow-up visit
  - Able to avoid further psychological trauma associated with suture removal

### Care of the HIV-Positive Patient in the Emergency Department in the Era of Highly Active Antiretroviral Therapy

- HAART therapy has decreased the mortality associated with HIV
- HAART is generally started when CD4 count is <350 cells/mL
- Consists of 2 nucleoside-analog reverse transcriptase inhibitors and either a non-nucleoside reverse transcriptase inhibitor or a protease inhibitor

### Care of the HIV-Positive Patient in the Emergency Department in the Era of Highly Active Antiretroviral Therapy

- Immune Reconstitution Inflammatory Syndrome
  - Exacerbate otherwise dormant opportunistic infections or aggravate clinically apparent infections
  - Most common pathogen involved is Mycobacterium avium complex

### Care of the HIV-Positive Patient in the Emergency Department in the Era of Highly Active Antiretroviral Therapy

- Immune Reconstitution Inflammatory Syndrome
  - Risk factors
    - Antiretroviral naive
    - Recent diagnosis of opportunistic infection
    - More rapid decrease in HIV RNA levels on PCR

### Care of the HIV-Positive Patient in the Emergency Department in the Era of Highly Active Antiretroviral Therapy

- Immune Reconstitution Inflammatory Syndrome
  - Generally manifests in first 8 weeks of therapy

### Care of the HIV-Positive Patient in the Emergency Department in the Era of Highly Active Antiretroviral Therapy

- Cardiovascular complications
  - Increased relative risk of MI with HAART, but absolute risk remains low
  - HIV associated dilated cardiomyopathy
    - In general, HAART decreases risk
    - Risk increased with zidovudine based therapy

### Care of the HIV-Positive Patient in the Emergency Department in the Era of Highly Active Antiretroviral Therapy

- Pulmonary complications
  - Before HAART, Pneumocystis pneumonia was most common pulmonary complaint
  - Now Streptococcus pneumoniae is most common cause of pneumonia
    - Patients receiving HAART are candidates for outpatient therapy if meet all other criteria for outpatient therapy

### Care of the HIV-Positive Patient in the Emergency Department in the Era of Highly Active Antiretroviral Therapy

- Renal/urologic complications
  - Renal failure becoming more common in HIV
    - Nephrotoxic drugs
    - Immunologic causes
    - Leading cause of death in HIV patients on HAART
  - Protease inhibitor indinavir is associated with urolithiasis

### Care of the HIV-Positive Patient in the Emergency Department in the Era of Highly Active Antiretroviral Therapy

- Neurologic complications
  - Decreased opportunistic infections with HAART
  - Progressive multifocal leukoencephalopathy remains major cause of encephalitis and mortality
  - Sensory neuropathies still common
  - CNS lymphoma decreased with HAART

### Care of the HIV-Positive Patient in the Emergency Department in the Era of Highly Active Antiretroviral Therapy

- GI/hepatobiliary complications
  - Decreased candida and CMV esophagitis
  - Diarrhea still common
  - Coinfection with hepatitis B and C is serious
    - Hepatitis C is associated with decreased response to HAART

### Care of the HIV-Positive Patient in the Emergency Department in the Era of Highly Active Antiretroviral Therapy

- GI/hepatobiliary complications
  - Atazanavir and indinavir are associated with a benign Gilbert's disease-like increase in unconjugated (indirect) bilirubin
  - Didanosine, stavudine and tenofovir are associated with pancreatitis

### Care of the HIV-Positive Patient in the Emergency Department in the Era of Highly Active Antiretroviral Therapy

- Hematologic/oncologic complications
  - Anemia may be caused by HAART
    - Usually macrocytic
    - HIV associated anemia usually normocytic
  - HAART has no influence on HIV associated TTP
  - Decreased incidence of Kaposi's sarcoma with HAART

### Care of the HIV-Positive Patient in the Emergency Department in the Era of Highly Active Antiretroviral Therapy

- Endocrine complications
  - Patients with Graves disease may have worsening symptoms with immune reconstitution syndrome
  - Increased risk of insulin resistance with HAART
    - Rarely develop frank diabetes

### Care of the HIV-Positive Patient in the Emergency Department in the Era of Highly Active Antiretroviral Therapy

- Musculoskeletal complications
  - Didanosine and stavudine can cause lactic acidosis
    - Patients present with severe muscle aches

### Hydrocortisone Therapy for Patients with Septic Shock

- Study looked at efficacy of low dose hydrocortisone in septic shock
  - Focused on patients with no response to corticotropin
  - Patients who had received etomidate were placed in a separate subset
    - Etomidate causes a decrease in steroid metabolism

### Hydrocortisone Therapy for Patients with Septic Shock

- Found no difference in mortality between patients who received steroid and those who did not
- Rate of reversal of shock was similar in the 2 groups
  - Time to reversal was shorter in the steroid group

### Hydrocortisone Therapy for Patients with Septic Shock

- Increased incidence of suprainfections was seen in the steroid group
- Study concludes no significant advantage to using steroids in septic shock
  - In fact, may be detrimental

### Transient Ischemic Attack: Risk Stratification and Treatment

- TIA is an episode of focal cerebral ischemia with symptom resolution within 24 hours
- There are several risk scores that can be used to predict short term risk of stroke
  - Do not identify patients requiring urgent intervention

### Transient Ischemic Attack: Risk Stratification and Treatment

- Testing
  - Lesions on diffusion weighted MRI predict high risk for subsequent stroke
  - Identification of large vessel disease has shown increased risk of stroke
    - Particularly if in extracranial internal carotid artery

## Transient Ischemic Attack: Risk Stratification and Treatment

- Hospitalization
  - Expedites work-up
  - Costly
    - Not all patients with TIA will experience a stroke

## Transient Ischemic Attack: Risk Stratification and Treatment

- Hospitalization
  - Consider for
    - First TIA
    - Crescendo TIA symptoms
    - Duration of symptoms > 1 hour
    - Carotid stenosis > 50%
    - Known cardiac source of embolus
    - Known hypercoagulable state

## Transient Ischemic Attack: Risk Stratification and Treatment

- Treatment
  - Start with basic supportive care
    - Position head of bed flat
    - Permissive hypertension
    - IVF
  - Once imaging has excluded possibility of hemorrhage, antithrombotic therapy should be started

## Transient Ischemic Attack: Risk Stratification and Treatment

- Treatment
  - Antiplatelet therapy
    - Aspirin treatment showed benefit for 9 out of every 1000 patients
    - One study showed clopidogrel may be slightly more effective than aspirin
  - Carotid endarterectomy for patients with carotid stenosis

## Transient Ischemic Attack: Risk Stratification and Treatment

- Treatment
  - Warfarin more effective than aspirin in preventing recurrent stroke in patients with atrial fibrillation

## Acetylcysteine for Acetaminophen Poisoning

- Acetaminophen poisoning categorized in 4 stages
  - Preclinical toxic effects (normal ALT)
  - Hepatic injury (elevated ALT)
  - Hepatic failure (hepatic injury with encephalopathy)
  - Recovery

## Acetylcysteine for Acetaminophen Poisoning

- Acetylcysteine prevents hepatic injury primarily by restoring hepatic glutathione
  - Prevents build up of toxic metabolites

## Acetylcysteine for Acetaminophen Poisoning

- Rumack-Mathew nomogram
  - Used to predict risk of toxic ingestion
  - Effective for serum levels between 4-24 hours of ingestion
  - Not useful if time of ingestion is unknown
    - Most experts recommend starting acetylcysteine in these cases

## Acetylcysteine for Acetaminophen Poisoning

- Rumack-Mathew nomogram
  - Not useful in chronic ingestions
    - Start acetylcysteine for
      - Serum level > 20 mcg/mL
      - Elevation in ALT
      - History of ingesting > 4 gm per day

## Acetylcysteine for Acetaminophen Poisoning

- Acetylcysteine may be given IV or po
  - All patients with liver failure should be given IV
  - Give IV if patient unable to take or keep down po

## Acetylcysteine for Acetaminophen Poisoning

- FDA recommended treatment
  - Oral
    - Loading dose of 140 mg/kg
    - Maintenance dose of 70 mg/kg every 4 hours for 17 doses

## Acetylcysteine for Acetaminophen Poisoning

- FDA recommended treatment
  - IV
    - Loading dose of 150 mg/kg over 15-60 minutes
    - Infusion of 12.5 mg/kg/hr for 4 hours
    - Then infusion of 6.25 mg/kg/hr for 16 hours

## Acetylcysteine for Acetaminophen Poisoning

- Adverse effects
  - Vomiting
    - Common with po
    - Give antiemetics and repeat dose in 1 hour

## Acetylcysteine for Acetaminophen Poisoning

- Adverse effects
  - Anaphylactoid reaction
    - More common with IV
    - Treat with diphenhydramine, steroids and bronchodilators, if needed
    - Restart acetylcysteine in 1 hour at a slower rate

## Concussion

- Immediate and transient loss of consciousness accompanied by brief period of amnesia after blow to head
  - Classic definition
- Momentary sensation of being dazed after head injury without loss of consciousness now considered mildest form of concussion

## Concussion

- Who needs head CT?
  - Several different rule sets
  - In general
    - Age under 16
    - Intoxicated
    - Those who cannot be observed
    - Those with bleeding tendencies or on anticoagulants

## Concussion

- Observation
  - Generally patients with normal neurologic exam can be observed for 2 hours and then discharged home
  - Give good instructions when to return

## Concussion

- Postconcussive syndrome
  - Symptoms
    - Headache
    - Dizziness
    - Nausea
    - Trouble concentrating
  - Symptoms may last from weeks to months

## Concussion

- Postconcussive syndrome
  - Need to educate and reassure patients
  - Antidepressants may be helpful in patients with protracted symptoms

## Current Management of Acute Cutaneous Wounds

- In general wound healing is accelerated by a moist environment
  - Topical antibiotics or occlusive dressing
  - Wet dressings that promote maceration should be avoided
- Abrasions
  - If particles not removed within 24 hours, may develop tattooing

## Current Management of Acute Cutaneous Wounds

- Lacerations
  - Skin tears treated within 8 hours can be treated with topical adhesive
  - Plantar puncture wounds
    - Prone to infection with staph or strep
    - If patient wearing tennis shoes, concern for pseudomonas osteomyelitis
    - Some studies have shown patients should receive prophylactic antibiotics

## Current Management of Acute Cutaneous Wounds

- Mammalian bites
  - Puncture wounds and scratches
    - Heal by secondary intention
  - Large bite wounds
    - High pressure irrigation followed by suturing
    - Consider delayed primary closure in 3-5 days if >12 hours old or highly contaminated

## Current Management of Acute Cutaneous Wounds

- Mammalian bites
  - Suspect human bites in wounds over metacarpophalangeal joints

## Current Management of Acute Cutaneous Wounds

- Subungual hematomas
  - Nail trephination with cautery recommended for most
  - Reserve nail removal for disruption of nail or surrounding nail folds

## Current Management of Acute Cutaneous Wounds

- Burns
  - Classification
    - First degree/superficial
    - Second degree
      - Partial thickness
      - Deep partial thickness
    - Third degree/full thickness

## Current Management of Acute Cutaneous Wounds

- Burns
  - Treatment
    - Cool burn with cold tap water within 30 minutes of injury
      - Has been shown to decrease pain and depth of burn
      - Avoid ice water which may increase tissue damage

## Current Management of Acute Cutaneous Wounds

- Burns
  - Treatment
    - Leave blisters intact
      - Intact blisters heal faster
    - May aspirate large blisters sterilely

## Current Management of Acute Cutaneous Wounds

- Burns
  - Treatment
    - If blisters ruptured
      - Wash with soap and water
      - Debride nonadherent necrotic epidermis
    - Use topical antimicrobial agent
      - Silver sulfadiazine may delay healing

## Current Management of Acute Cutaneous Wounds

- Chemical burns
  - Generally treat with copious water lavage
  - Important exception is injury with elemental metals
    - Lithium, sodium, magnesium, potassium
    - Water may cause spontaneous ignition

## Current Management of Acute Cutaneous Wounds

- Chemical burns
  - Hydrofluoric acid burns lead to intense pain and tissue damage
    - Used in etching and rust removal
    - Treat with copious irrigation followed by calcium gluconate gel or subcutaneous injection
    - Larger burns may require monitoring for hypocalcemia



## Current Management of Acute Cutaneous Wounds

- Frostbite
  - Treatment
    - Rapid rewarming in water of 40-42° C
    - Give opiates to control pain
    - Initial treatment is conservative
      - Takes weeks to see true extent of damage