Objectives

- What are the barriers to appropriate antibiotic usage?
- What are the concerns surrounding antibiotic usage?
- What are the guidelines for common outpatient diagnoses requiring antibiotics?

Barriers to Appropriate Therapy

- Patient Expectation
  - Dissatisfaction if no antibiotic prescribed
  - Internet

- Cost
  - What can the patient afford vs. what does the patient need

Concerns

- Cost
  - Patient paying for unnecessary therapy

- Adverse Outcomes
  - C. difficile
  - Resistance
    - Per the Infectious Disease Society of America
      "Antimicrobial resistance is recognized as one of the greatest threats to human health worldwide."
      "Antibiotics are becoming less and less effective, in part due to over-prescription and inappropriate use."
      "New antibiotic development has slowed to a standstill due to market failure and regulatory disincentives."

Guidelines for Therapy

- Bacterial Rhinosinusitis
- Streptococcal Pharyngitis
- Community Acquired Pneumonia
- Acute Uncomplicated Cystitis & Asymptomatic Bacteruria in Adults
- Skin & Soft Tissue Infection with MRSA

Acute Bacterial Rhinosinusitis

- Management Issues
  - Difficulty distinguishing between bacterial and viral rhinosinusitis
  - Gaps in knowledge and quality evidence for empiric therapy
  - Changing susceptibility profiles
  - Emergence of non-vaccine serotypes
### Acute Bacterial Rhinosinusitis

#### Recommendations
- Bacterial vs. viral (any of 3)
  - Persistent symptoms or signs compatible with acute rhinosinusitis lasting ≥ 10 days without any evidence of clinical improvement
  - Onset with severe symptoms or signs of high fever (≥ 102) and purulent nasal discharge or facial pain lasting at least 3-4 consecutive days at beginning of illness
  - Onset with worsening symptoms or signs characterized by the new onset of fever, headache, or increase in nasal discharge following a typical viral URI that lasted 5-6 days and were initially improving

#### Antibiotic of Choice
- **Amoxicillin-clavulanate**
  - **Empiric Therapy**
    - Adults and children
      - Adults—500mg po q8hrs or 875mg po q12hrs
      - Children—45mg/kg/day (<16yoa)

#### Antibiotic of Choice—2nd line therapy adults
- **Doxycycline**
  - alternative in adults
    - 200mg/day in 1-2 divided doses
- **Levofloxacin**
  - Alternative in adults if PCN allergic and cannot take doxy
    - 750mg po q24hrs

#### Antibiotic of Choice—2nd line therapy children
- **3rd generation CPH (cefixime/cefpodoxime) + clindamycin**
  - Cefixime 8mg/kg/day divided every 12hrs(max 400mg/day) + clinda 30-40mg/kg/day every 8hrs
  - Cefpodoxime 10mg/kg/day divided every 12hrs (max200mg/dose) + clinda 30-40mg/kg/day every 8hrs
- **Levofloxacin**
  - If Type 1 hypersensitivity rxn to PCN
    - 10-20 mg/kg/day divided every 12-24hrs

#### Length of Therapy
- **Adults**
  - 5-7 days
- **Children**
  - 10-14 days
Acute Bacterial Rhinosinusitis

- Adjunctive therapy
  - Saline irrigation
    - adults
  - Intranasal CCS
    - Patients with history of allergic rhinitis
  - Topical/oral decongestants
    - Not recommended
- Non-responsive patient
  - Consider alternative if symptoms worsen after 48-72hrs of initial antimicrobial therapy or fail to improve after 3-5 days
  - Evaluate for resistance, non-infectious etiology, structural abnormality
  - Obtain cultures by direct sinus aspiration

Streptococcal Pharyngitis

- Diagnosis
  - Low incidence of GAS pharyngitis in adults
    - 5-15%
  - Anti-streptococcal antibody titers are not recommended in routine diagnosis
    - Throat swab
  - Rapid Antigen Detection Test (RADT) and/or culture
    - In children—negative RADT should be followed by a culture

- When Not to Test
  - Not if strong clinical features of viral etiology
    - Cough, rhinorrhea, hoarseness, oral ulcers
  - Not if <3yoa
    - Acute rheumatic fever is rare in children<3 and classic presentation of streptococcal pharyngitis are uncommon
  - Considered if older sibling with GAS infection
  - Not for follow-up
  - Not for asymptomatic household contacts

Streptococcal Pharyngitis

- CENTOR criteria
  - Widely used and accepted decision making tool
  1. Tonsillar exudates
  2. Tender anterior cervical adenopathy
  3. Fever by history
  4. Absence of cough
    - (0 to 2)—unlikely, do not need abx/diagnostic test
    - (3 to 3)—treat empirically, but don’t test

Streptococcal Pharyngitis

- Treatment
  - 10 days of therapy
  - Penicillin VK
    - Adults—500mg po bid
    - Children—250mg po 2-3x/day (< /= 27kg)
  - Amoxicillin
    - Adults—1000mg po qday
    - Children—50mg/kg/day

- Treatment
  - 10 days of therapy
    - PCN-allergic
      - Cefuroxime 250 po bid (ADULTS) or 125 mg po bid (CHILDREN)
      - Clindamycin or clarithromycin x 10 days
      - Azithromycin x 5 days
      - Aspirin should be avoided in children
      - APAP/NSAIDs for moderate to severe symptoms or to control high fevers
    - CCS not recommended
Community Acquired Pneumonia

- Update in Progress
- Diagnosis
  - Hospital?
    - CURB-65 criteria (confusion, uremia, respiratory rate, low blood pressure, age 65 years or older)
  - Pneumonia Severity Index (PSI)
- Testing
  - Optional for outpatients

Asymptomatic Bacteriuria in Adults

- Diagnosis
- Microbiology
- Treatment/Duration

Asymptomatic Bacteriuria in Adults

- Diagnosis
  - based on results of culture of a urine specimen collected in a manner that minimizes contamination
    - Asymptomatic women
      - 2 consecutive voided urine specimens with isolation of the same bacterial strain in quantitative counts ≥ 10^5 cfu/mL
    - Men
      - Single, clean-catch urine specimen with 1 bacterial species in a quantitative count ≥ 10^5 cfu/mL
    - Both
      - Single catheterized urine specimen with 1 bacterial species in a quantitative count ≥ 10^5 cfu/mL
  
  **Note:** IDSA Guidelines for Asymptomatic Bacteriuria (CID 2005:40 (1 March); 643)

Community Acquired Pneumonia

- Outpatient Treatment
  - Empiric
    - Previously healthy & no use of antimicrobials within previous 3 months
      - Macrolide
    - Presence of comorbidities
      - Respiratory FQ
      - B-lactam + macrolide
    - Regions with a high rate (>25%) of infection with high-level (MIC≥16 mcg/mL), macrolide resistant Streptococcus pneumoniae without comorbidities
      - B-lactam + macrolide

Community Acquired Pneumonia

- Macrolides
  - Azithromycin 500mg po x1, then 250mg po qday for 4 days
  - Clarithromycin 250 po q12hrs x 7-14 days OR 1000mg (2 500mg ER tabs) po qday x 7 days
  - Respiratory FQ
    - Levofloxacin 750mg po qday x 5 days
    - Moxifloxacin 400mg po qday x 7-14 days
  - B-lactams
    - Augmentin 2g po bid x 7-10 days + macrolide
    - Cefpodoxime 200mg po bid x14 days + macrolide

Community Acquired Pneumonia

- Prevention
  - Flu vaccine
    - All persons >/= 50yoa , others at risk for influenza complications, household contacts of high-risk persons, and healthcare workers should receive inactivated influenza vaccine yearly
  - Intranasal live vaccine is alternative for persons 5-49yoa w/o chronic underlying diseases
  - Pneumonia Vaccine
    - Pneumococcal polysaccharide vaccine is recommended for persons >/= 65yoa and for those with selected high-risk concurrent diseases
Asymptomatic Bacteriuria in Adults

**Diagnosis**
- Pyuria accompanying asymptomatic bacteriuria is not an indication for treatment
- Pregnancy
  - Screen for bacteriuria by urine culture at least once in early pregnancy
  - Treat if results are positive
- Duration
  - 3-7 days
- Periodic screening for recurrent bacteriuria following therapy

**Microbiology**
- **Men**
  - CNS
  - Gram-negative bacilli
  - Enterococcus species
  - Proteus mirabilis
- **Women**
  - *Escherichia coli*
  - Less virulent strains when found in asymptomatic patients
  - *Klebsiella pneumonielactate*
  - CNS
  - Enterococcus species
  - Group B streptococci
  - *Gardnerella vaginalis*

**Treatment/Duration**
- Not empiric
- Target organism cultured after following diagnosis strategies if treatment is necessary

Acute Uncomplicated Cystitis and Pyelonephritis

**Acute Uncomplicated Cystitis**
- Nitrofurantoin
  - 100mg po bid x 5 days
- Trimethoprim-sulfamethoxazole
  - 1 DS tab po bid x 3 days
- Fluoroquinolones
  - ciprofloxacin/levofloxacin/ofloxacin
  - 3 day regimens
  - High propensity for collateral damage
- B-lactam agents
  - Ampicillin or amoxicillin should NOT be used empirically due to poor efficacy and high resistance

**Acute Pyelonephritis**
- 1st obtain urine culture and susceptibility
- Fluoroquinolones
- Patients not requiring hospitalization
- If prevalence of resistance is <10%
  - Ciprofloxacin
    - 500 po bid x 7 days
    - 1000mg ER po qday x 7 days
  - Levofloxacin
    - 750mg po qday x 5 days
Acute Uncomplicated Cystitis and Pyelonephritis

- Acute Pyelonephritis
  - Trimethoprim-sulfamethoxazole
    - 1 DS tab po bid x 14 days (if susceptibility unknown—recommended to give CTX 1g/dose IV)
  - B-lactams
    - Less effective, use CTX 1g x1dose IV
    - 10-14 days

Skin and Soft-Tissue Infection

- MRSA
  - Initial infection
  - Recurrent infection

Skin and Soft-Tissue Infection

- MRSA
  - Initial infection
    - Cutaneous abscesses
      - Incision and drainage
        - Sufficient for simple abscesses or boils
        - Antibiotic therapy
      - Abscesses associated with severe or extensive disease or rapid progression
    - Pusulent cellulitis
      - Empirical therapy pending culture results
      - Not recommended for B-hemolytic strep
      - 3-10 days but should be individualized
    - Nonpusulent cellulitis
      - Empirical therapy for CA-MRSA in patients who do not respond to B-lactam therapy
      - 5-10 days but should be individualized

Skin and Soft-Tissue Infection

- Recurrent
  - Educational message on personal hygiene and appropriate wound care
  - Education about environmental hygiene
  - Decolonization
    - If recurrent SSTI despite optimizing wound care and hygiene measures
    - Ongoing transmission among household contacts despite optimizing wound care
      - Mupirocin bid 5-10 days nasally with or w/o topical body decolonization with chlorhexidine for 5-14 days
    - Oral ABX for active infection only and not for decolonization

Questions???