Adult Pulmonary Infections

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Continuing Medical Education
Disclosure Statement

Dr. King has nothing to disclose.

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Learning Objectives

1. Discuss the diagnostic and risk factor approaches to common types of pneumonia.
2. Be able to describe empiric therapy of pneumonia for outpatients and inpatients.
3. Explain the use and ACIP recommendations for pneumonia and influenza vaccines.
4. Manage a patient with positive test for TB.
Community Acquired Pneumonia (CAP)

- 8th leading cause of death in the United States (along with influenza), 6th leading cause in those > 65 yrs of age
- Over 55,000 deaths annually
- 1st globally in children
- 1.25 million cases of hospitalization for pneumonia
- 67% of those > 65 received pneumonia vaccine
Community Acquired Pneumonia (CAP)

- 5.6 million cases occur annually
  - 18-20% require hospitalization
    - 60% of these are > 65 yrs old
    - Many now classified as having HCAP due to NH or frequent contacts with health care environments (dialysis, home infusions, repeated hospitalizations)
- Mortality rate is 1-5% for those treated as outpatients
  - Up to 12-25% for those requiring hospitalization
  - Up to 30-50% when ICU is needed
Pneumonia

• Identification of specific pathogen is difficult
  – None is identified in one third to one half of patients, even with the most rigorous work-ups
• Initial treatment is usually empiric
• Up to 50% may be viral
Pneumonia Guidelines

• Implementation of CAP guidelines have shown several outcome improvements
  – Reduced costs
  – Reduced length of stay
  – Reduced in-hospital mortality
  – Reduced number of days on mechanical ventilation
Pneumonia Studies

• Study by McCabe et al (> 54,000 pts from 113 community-based hospitals and tertiary centers)

• 65% received initial guideline-concordant Rx; associated with decreased
  – In-hosp mortality (OR 0.7)
  – Sepsis (OR 0.83)
  – Renal failure (OR 0.79)
  – Length of stay & parenteral Rx by 0.6 days (p < 0.001 for both)

• These findings were linked to Rx with a fluoroquinolone or a macrolide
Pneumonia Guidelines

• First in 1993 by the ATS and Canada
• Most recently in 2007 by the ATS/IDSA
  – Currently being updated in 2014
• Medicare has developed performance measures for CAP that all hospitals must follow and that are publically reported
Hospital Admission Decision

Tools for identifying patients with CAP who may be candidates for hospitalization

• Severity-of-illness score: CURB-65
  – Confusion
  – Urea (BUN > 20)
  – RR > 30 b/min
  – BP sys < 90 mm Hg
  – Age > 65

• 1 point each, 2 points or more is risky
# CURB-65
## Severity Scores for CAP

<table>
<thead>
<tr>
<th>Clinical Factors</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confusion</td>
<td>1</td>
</tr>
<tr>
<td>Blood urea nitrogen (BUN) &gt; 19 mg/dL</td>
<td>1</td>
</tr>
<tr>
<td>Respiratory rate ≥ 30 breaths/min</td>
<td>1</td>
</tr>
<tr>
<td>SBP &lt; 90 mm Hg</td>
<td>1</td>
</tr>
<tr>
<td>DBP ≤ 60 mg Hg</td>
<td>1</td>
</tr>
<tr>
<td>Age &gt; 65</td>
<td>1</td>
</tr>
</tbody>
</table>

**Total Points?**

*If BUN is reported in mmol/L then the cut off is > 7 mmol/L*
<table>
<thead>
<tr>
<th>CURB-65 Score</th>
<th>Death %</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.6</td>
<td>Low risk; consider home treatment</td>
</tr>
<tr>
<td>1</td>
<td>2.7</td>
<td>Short inpatient hosp or closely supervised outpatient treatment</td>
</tr>
<tr>
<td>2</td>
<td>6.8</td>
<td>Short inpatient hosp or closely supervised outpatient treatment</td>
</tr>
<tr>
<td>3</td>
<td>14</td>
<td>Severe pneumonia; hospitalize, consider ICU</td>
</tr>
<tr>
<td>4 or 5</td>
<td>27.8</td>
<td></td>
</tr>
</tbody>
</table>
1. A 68-year-old woman presents to your office with cough, fever (T=102), and rales in the left base. Her BUN is 22, her BP is 130/96, RR=28, and her mentation is clear. Her CURB-65 score is?

A. 1
B. 2
C. 3
D. 4
E. 5
1. A 68-year-old woman presents to your office with cough, fever (T=102), and rales in the left base. Her BUN is 22, her BP is 130/96, RR=28, and her mentation is clear.
Her CURB-65 score is?

A. 1 
B. 2 
C. 3 
D. 4 
E. 5

59%
PSI

- PSI (pneumonia severity index)—risk calculator online, more complex

ICU Admission Decision

• Patients with either of 1 of the major criteria or 3 of the minor criteria
  – Major criteria
    • Need for mechanical ventilation
    • Septic shock
  – Minor criteria
    • PaO2/FiO2 ratio < 250
    • RR > 30/min
    • Confusion
    • Multilobar infiltrates
    • SBP < 90 mm Hg despite fluid resuscitation
    • BUN > 20 mg/dL
    • Leukopenia (< 4000 cells/mm3)
    • Thrombocytopenia (< 100,000 cells/mm3)
    • Hypothermia (< 36 degrees Celsius)
    • Hyponatremia (< 130 mEq/L)
    • Arterial pH < 7.3
2. A 18 yo WM presents to the ED with a fever of 101.5 F, productive cough for the past 3 days. His parents smoke in the home and car.

What is the most likely pathogen causing his illness?

A. Staphylococcus aureus
B. Mycoplasma pneumoniae
C. Streptococcus pneumoniae
D. Chlamydia pneumoniae
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Empiric Approach to Treatment

• Empiric approach is used, treating for the epidemiologically most common organisms
• Rapid tests are not yet comprehensive enough and reliable enough to direct therapy to specific pathogens

Thorax, van der Eerden
Community Acquired Pneumonia (CAP)

Most common pathogens

- *Streptococcus pneumoniae* 20-60%
- *Mycoplasma pneumoniae* 1-40%
- *Chlamydia pneumoniae* 4-10%
- *Legionella* 2-10%
- *Haemophilus influenzae* 3-10%
- *Moraxella catarrhalis* 1-5 %
- Virus & anaerobes 2-15%
Community Acquired Pneumonia (CAP)

Less common pathogens

- Staphylococcus
- Gram negative bacilli (3-10%)
- Pneumocystis
- *Mycobacterium tuberculosis*

Other causes

- Aspiration (6-10%)
Modifying Factors

Pediatric patients

- Age 4 mo to 4 yrs
  - Most common pathogen
    - RSV
  - Peak incidence
    - 2-7 mo of age

- Age 5-15 yrs
  - Most common pathogen
    - *Mycoplasma pneumoniae*
  - Treat with a macrolide
Modifying Factors

Increased risk for drug-resistant streptococcus pneumoniae (DRSP)

- Age > 65 (OR = 3.8)
- Beta-lactam Tx in last 3 mo (OR = 2.8)
- ETOH abuse (OR = 5.2)
- Immunosuppressive illness
- Multiple medical comorbidities
  - Chronic heart, lung, liver, or renal dz, DM, malignancies, asplenia, immunosuppressed conditions
- Exposure to children in a day care center
Treatment Guidelines (2007 ATS)

- **Outpatient—if healthy**, newer macrolide or doxycycline (no QT prolongation)
- **Outpatient with co-morbidities**—respiratory quinolone, or a beta-lactam (amox, or with clavulanate) PLUS a newer macrolide
Treatment Guidelines (2007 ATS)

- **Inpatient**—non-ICU, respiratory quinolone, OR a beta-lactam (ceftriaxone, amp-sulbactam, ertapenem) PLUS a newer macrolide
- **ICU**—Resp quinolone, plus anti-pneumo-beta-lactam or aztreonam
- Or use anti-pseudomonal (pip-tazo or meropenem) plus quinolone plus vanc
DRSP

• In the US, most penicillin resistance is intermediate and not highly resistant

• Definitions
  – Sensitive = MIC ≤ 2 mg/L
  – Intermediate = MIC of 4 mg/L
  – Resistance = MIC ≥ 8 mg/L
• Macrolide resistance is increasing in frequency
  – Upward of 40%
  – Due to an efflux mechanism that may not be significant clinically because local concentrations at respiratory sites of infection may be adequate for effective therapy
  – In Europe it is due to inability to bind at the ribosomal site of action, thus clinically significant
• Quinolone resistance is uncommon
• Repeated doses of a given agent in the same patient increases risk for all classes of agents
  – Therefore pts should not receive the same agent if given in the past 3 months
CAP Diagnosis/Work-up

• Thorough history and physical
  – Constellation of suggestive clinical features
    • Cough 90%
    • Sputum production 66%
    • Dyspnea 66%
    • Pleuritic chest pain 50%
    • Fever
    • Malaise
  – Smoking history

– H/o comorbidities
  • Chronic heart, lung, liver, or renal disease
  • DM
  • Alcoholism
  • Malignancies
  • Asplenia
  • Immunosuppression
  • Previous antibiotics within 3 mo
CAP Diagnosis/Work-up

• CXR
  – Demonstrable infiltrate
  – False negative (repeat in 24-48 hrs if suspect clinically)
    • Dehydration
    • Elderly patients

• CBC
CAP Diagnosis/Work-up

• Sputum for gram stain and culture (SOR B)
  – Done prior to Rx only if good quality and rapidly processed in a microbiology lab
  – Not sensitive but fairly specific
  – May be useful to exclude *Staph. aureus* or gram negative rods

• Blood cultures (x 2) (SOR A)
  – Most helpful in those with severe CAP
    • Collected prior to antibiotic Rx
  – Positive in 5-14% of cases
  – *S. pneumoniae* accounts for 2/3 of positive cultures
CAP Diagnosis/Work-up

• Those with severe illness and who have failed outpatient Rx
  – Legionella, TB tests, and pneumococcal urinary antigen testing (UAT) should be done

• If intubated
  – Endotracheal aspirate should be sent for culture
CAP Diagnosis/Work-up

• Vital signs and mental status
  – Screening with pulse oximetry
• Physical findings
  – Examination of lungs
    • Rales
    • Bronchial breath sounds
• Consider NP swab for influenza A & B (when in proper season)
  – Rapid testing is indicated if the Dx is uncertain
3. 55-yr-old WM with a 4-day history of productive cough, fever up to 102.3 F and a CXR showing a RLL infiltrate. PMH: smoker x 20 yrs, received a Z-pak 4 months ago for sinusitis. The appropriate choice for outpatient treatment is?

A. Macrolide plus a beta-lactam
B. Macrolide
C. 3rd generation cephalosporin
D. Beta-lactam if post influenza
3. 55-yr-old WM with a 4-day history of productive cough, fever up to 102.3 F and a CXR showing a RLL infiltrate. PMH: smoker x 20 yrs, received a Z-pak 4 months ago for sinusitis.

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B. Macrolide  
C. 3rd generation cephalosporin  
D. Beta-lactam if post influenza

70% ✔  
12%  
14%  
4%
4. 81-yr-old woman presents from the NH with a 2 day h/o increased confusion and poor po intake. She has had a productive cough for about 6 days and had been started on amoxicillin/clavulanate 3 days ago without improvement.

VS: BP 85/50, RR 30, T 100.8, HR 120 and a

CXR: bilateral LL infiltrates.

True statements include all of the following except?

A. The patient should be hospitalized for IV antibiotics
B. She is at lower risk for drug resistant pneumonia
C. She may have resistant organisms, so coverage could include pap-tazo plus cipro
D. A combination of antibiotics is generally indicated
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Principles to Guide Therapy

- Give 1\textsuperscript{st} dose rapidly and before leaving ED
- All pts should be treated for atypical pathogens and pneumococccus
  - Plus other pathogens based on risk factors
- Monotherapy with macrolides should be limited to pt with no cardiopulmonary disease or recent antibiotics
- Anti-pseudomonal Rx should be used for pts with pseudomonal risk factors
- MRSA Rx should be used if increased risk
- No ICU admit should receive monotherapy
Treatment

- Outpatient initial empiric therapy
- Previously healthy
- No risk for DRSP infection
  - Macrolides (SOR A)
    - Azithromycin
    - Clarithromycin
    - Erythromycin or
  - Doxycycline (SOR B)
Treatment

• Outpatient initial empiric therapy
• Comorbidities present
  – Respiratory fluoroquinolone (SOR A)
    • Moxifloxacin, gemifloxacin, or levofloxacin
  – Beta-lactam plus a macrolide (SOR A)
    • High-dose amoxicillin (1gm tid) or Amox/clavulanate (2g bid) (preferred)
    • Alternatives include ceftriaxone, cefpodoxime, cefuroxime (500 mg bid)
    • Doxycycline can be an alternative to the macrolide
Treatment

• Inpatient (Non-ICU)
  – Respiratory fluoroquinolone (IV or PO) (SOR A)
  Or
  – Beta-lactam (IV or IM)
    • Cefotaxime, ceftriaxone, and ampicillin/sulbactam
    • Ertapenem for selected pts
  Plus
  – Macrolide (IV or PO) (erythro, clarithro, azithro)
    • Doxycycline maybe substituted (SOR C)
Treatment

• Inpatient (ICU)
  – Beta-lactam (IV)
    • Cefotaxime, ceftriaxone, and ampicillin/sulbactam
  Plus
  – Fluoroquinolone (SOR A)

If PCN allergic
  – Fluoroquinolone and aztreonam are recommended
Treatment

• Inpatient (ICU) (SOR C)
  **For Pseudomonas infections
  – Anti-pneumococcal/anti-pseudomonal beta-lactam (IV)
    • Piperacillin/tazobactam, cefepime, imipenem, or meropenem
  Plus either a
  – Fluoroquinolone (IV) (levofloxacin, ciprofloxacin)
    or
  – An aminoglycoside
    and
  – An antipneumococcal fluoroquinolone
If PCN allergic substitute aztreonam for the beta-lactam
Healthcare-Associated Pneumonia (HCAP)

- Defined as a patient with prior hospitalization, NH residents, or immunocompromised state
- Treat differently from CAP
- More common pathogens:
  - MRSA
  - *S. pneumoniae*
  - *P. aeruginosa*
  - MSSA (methicillin-sensitive *S. aureus*)
  - *H. influenzae*
- Hospital mortality is 12-23%
- **BIRP** criteria (pts at high risk for drug-resistant pneumonia)
  - **B**: broad spectrum antibiotics within past 3 mo
  - **I**: ICU admission
  - **R**: resident of a NH or poor functional status
  - **P**: prior hospitalization within past 3 mo
Healthcare-Associated Pneumonia (HCAP)

- Nursing-home resident
  - Antipseudomonal cephalosporin
    - Cefepime, ceftazidime Or
  - Antipseudomonal carbapenem
    - Imipenem, meropenem Or
  - Beta-lactam/Beta-lactamase inhibitor
    - Piperacillin/tazobactam Plus
  - Antipseudomonal fluoroquinolone
    - Levo, cipro Or
  - Aminoglycoside
    - Gentamicin, tobramycin and Consider
  - Anti-MRSA agents
    - Vancomycin, linezolid
Treatment

• Reduce time to first antibiotic dose (SOR B)
  – Admission through the ED
    • Given while in the ED
• Switching from IV to PO (SOR B)
  – Hemodynamically stable
  – Improving clinically
  – Able to take PO and normal functioning GI tract
Treatment

- Discharge (SOR B)
  - Clinically stable
  - No other active medical problems
  - Safe environment for continued care
  - Inpatient observation is not necessary while receiving PO Rx
When to Stop Treatment

• CAP pts should be treated
  – For a minimum of 5 days (SOR A)
  – Until afebrile for 48-72 hrs
  – Until no more than 1 CAP associated sign of clinical instability (SOR B)
    • Temp $\leq$ 37.8 C
    • HR $\leq$ 100 BPM
    • RR $\leq$ 24 BrPM
    • SBP $\geq$ 90 mm hg
    • O2 Sats $\geq$ 90% pO2 $\geq$ 60 mm Hg on Rm air
    • Ability to maintain oral intake
    • Normal mental status

(Halm and Fine, JAMA)
Tx for Drug-Resistant S. Pneumoniae (DRSP)

- Incidence of DRSP is stabilizing
  - Resistance to PCN and cephalosporins is decreasing
  - Resistance to macrolides is increasing
    - > 25% in some areas

- For CAP that is a MRSA infection
  Add
  - Vancomycin or linezolid (SOR C)
CAP That Is a MRSA Infection

- Severe CAP, particularly after an episode of influenza, may need coverage for *S. aureus* including MRSA
- Linezolid with rifampin
- Vancomycin alone may not be adequate
  - It is not active against the PVL toxin that accompanies CA MRSA
  - Add clindamycin to vancomycin or
  - Linezolid
5. Which of the following does not need the pneumococcal vaccine?

A. A healthy 2-month-old infant
B. A 70-year-old woman who had pneumococcal vaccine 5 years ago
C. A 45-year-old female who smokes cigarettes and has not previously received the pneumococcal vaccine
D. A 56-year-old male with chronic renal failure who received the pneumococcal vaccine at age 50
E. A 65-year-old male who is uncertain of his immunization status
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E. A 65-year-old male who is uncertain of his immunization status
Pneumococcal Vaccine

• *S. pneumoniae* causes:
  – 19,000 preventable deaths per year (pneumonia, bacteremia, meningitis)
  – 7 million cases of otitis media per year

• Polyvalent vaccine
  – 23 serotypes that cause 80% of invasive pneumococcal disease in US
  – B-cell response
  – 96% drop in pneumonia caused by susceptible strains

• PCV-13 (replaces PCV-7)
  – T-cell response
Pneumococcal Vaccine

Prevnar 13 (SOR A)

• Decreases hospitalizations, costs, and invasive disease
• Primary series 2, 4, 6 months, booster 12-15 months
• Catch up: first dose at
  – 7-11 months: give 2 doses and booster 8 wks later
  – 12-23 months: 2 doses 8 wks apart
  – 2-5 years: one dose for healthy, unvaccinated children
  – 2-5 years: two doses 8 wks apart for at-risk children
• If rec’d PCV-7 series, in children 14-59 months give one supplemental dose of PCV-13
Invasive Pneumococcal Disease (IPD)

- Children < 5 y continue to develop IPD
- Because patients who have received only the PCV 7 vaccine remain at risk for IPD caused by serotypes unique to PCV 13, CDC is urging health care professionals to
  - Review patients’ immunization records
  - Provide patients ages 14-59 months who have completed the full PCV 7 series a supplemental dose of PCV 13
  - Use PCV 13 rather than PCV 7, even if office supplies of PCV 7 are not exhausted.
Polyvalent Vaccine (PPSV) 23

- Single dose at age ≥ 65 years
- Children at risk ≥ 2 yrs give at least 8 wks after last PCV 13
- Indications for single dose for those 2-64 years of age:
  - Chronic cardiac disease (especially cyanotic congenital and failure)
  - Cirrhosis, chronic liver disease, alcoholism
  - Cochlear implants, cerebrospinal fluid leak
  - Diabetes
  - Chronic lung disease, asthma, smoker
  - Residents of chronic care institutions
- Indications for 2 doses 3-5 years apart ages 2-64:
  - Chronic renal disease (renal failure and nephrotic syndrome)
  - Asplenia, sickle cell*
  - Immunocompromised (HIV, congenital, leukemia/lymphoma, multiple myeloma, drugs or radiation, organ transplant)
- 2nd dose = more local site reactions
Pneumococcal Vaccine

• If ≥ age 19 with
  – Immunocompromised patient
  – Functional or anatomic asplenia
  – CSF leaks
  – Cochlear implants

• Give PCV 13 one or more years after the last PPSV 23, OR

• If PCV 13- and PPSV 23-naïve, receive single dose of PCV 13 followed by a dose of PPSV 23 at least 8 weeks later

6. A 49-yo African American female with diabetes who is scheduled to start working in the ICU had a PPD placed 48 hours ago. She has never been tested previously, but her mother moved in with her a year ago and had a sister who died of TB as a child. What is considered a positive test in this patient?

A. Redness > 10 mm in diameter
B. Induration and redness > 5 mm in diameter
C. Induration > 10 mm in diameter
D. Induration > 10 mm and redness > 15 mm
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Testing for *M. Tuberculosis* Infection

- Mantoux tuberculin skin test (TST)
  - Skin test that produces delayed-type hypersensitivity reaction in persons with *M. tuberculosis* infection

- Interferon-Gamma Release Assays (IGRAs)
  - QuantiFERON® Gold (QFT-G), T-SPOT, QFT-GIT (Gold In-Tube), TB Quant
  - Blood test that measures and compares amount of interferon-gamma (IFN-γ) released by blood cells in response to antigens
IGRAs

• CDC recommends that IGRAs can be used in all circumstances in which the TST is currently used, including contact investigations
• Can be used in place of the TST
• A positive test should prompt the same evaluation and management as a positive TST
• NO reason to follow a (+) IGRA with a TST
• Limitations
  – Must be processed within 8-16 hours
  – Limited data on
    • Children < 5 yrs of age
    • Recent exposed to TB
    • Immunocompromised persons
    • Those who will be tested repeatedly (serial testing)
Selecting a Test

• IGRAs
  – Require a single visit
  – Don’t cause booster phenomenon
  – Less subject to reader bias
  – Unaffected by BCG and most environmental mycobacteria
  – Preferred method for
    • Groups of people who have poor rates of returning to have a TST read
    • Persons who have received BCG vaccine

• TST
  – Preferred method for
    • Children < 5 yrs of age

• Either may be used without preference for other groups that are tested for LTB
Reading a TST

• Measure reaction in 48 to 72 hours
• Measure induration, not erythema
• Record reaction in millimeters, not “negative” or “positive”
• Ensure trained health care professional measures and interprets the TST
  – Positive TST reactions can be measured accurately for up to 7 days
  – Negative reactions can be read accurately for only 72 hours
TB Skin Testing

> 5 mm is considered positive if:

- HIV sero-positive
- Recent TB direct contact
- CXR shows prior inactive TB
- Immunosuppressed patients
  - Prednisone > 15 mg/day
  - Organ transplant recipients
TB Skin Testing

> 10 mm is considered positive if:

- Diabetic
- Renal failure
- Cancer
- Immigrant < 5 yrs
- High-prevalence area

- Long-term care facility
  - Resident or employee
- Inmate
- IV drug user
- Children < 4 yrs of age
- Mycobacteriology lab personnel
TB Skin Testing

> 15 mm is considered positive if:

- Any person with no known risk factors
  - Even if prior BCG vaccination
Booster Phenomenon

- Some people infected with *M. tuberculosis* may have a negative reaction to the TST if many years have passed since they became infected.
- They may have a (+) reaction to a subsequent TST because the initial test “stimulates” their ability to react to the test.
  - This may incorrectly be interpreted as a skin test conversion
- The two-step test is indicated
Two-Step Skin Testing

• Testing of persons who will periodically receive TSTs (eg, health-care workers or residents of long-term-care facilities) to reduce the likelihood of mistaking a boosted reaction for a new infection.
Two-Step Skin Testing

• If an initial TST result is classified as negative, a second test is repeated 1–3 weeks later. If the first test is positive, consider them infected.

• If the second TST is also negative, the person is classified as not being infected.

• If the reaction to the second TST is positive, it probably represents a boosted reaction, indicating that the infection was most likely in the past and not recent.
  – If they have never been treated in the past, this patient should be evaluated and treated accordingly
Positive—TST or QFT-G

- Check CXR for active disease
  - Negative
    - INH Rx for 6-9 months (9 mo is preferred)
      - Daily or intermittently (twice weekly)
      - Use directly observed therapy (DOT) for intermittent regimen
    - Rifampin Rx daily for 4 months
    - Consider adding Pyridoxine
    - Monthly exams for signs of hepatitis and medication adherence, check liver transaminases if indicated
Positive—TST or QFT-G

- Check CXR for active disease
  - Positive
    - 10 drugs are currently approved
    - First-line agents form the core of Rx:
      - Isoniazid (INH)
      - Rifampin (RIF)
      - Ethambutol (EMB)
      - Pyrazinamide (PZA)
    - Typically treated with several drugs for 6-12 months
Laboratory Testing

- Routine baseline transaminases are not necessary
- Recommended for pts with any of the following
  - Liver disorders
  - H/o liver disease (Hep B or C, alcohol hepatitis or cirrhosis)
  - Regular use of alcohol
  - Risks for chronic liver disease
  - HIV infection
  - Pregnancy or immediate postpartum period (3 months)
- Consider if on meds for chronic conditions
- Periodic retesting only for those with abnormal initial results or those at risk for hepatic disease, or anytime pts develop Sxs of hepatitis
Positive—TST or QFT-G

• Treatment continued:
  – Initial phase of 2 mo
  – Continuation phase of either 4 or 7 mo

• Treatment completion is determined by the number of doses ingested over a given period of time.
  – Basic TB regimens are broadly applicable; modifications should be made for:
    • HIV infection
    • Drug resistance
    • Pregnancy
    • Children
Active TB Preferred Rx Regimen

• Initial phase
  – INH, RIF, PZA, EMB x 8 wks (56 doses)
    • EMB can be discontinued if TB is susceptible to first-line drugs

• Continuation phase
  – INH and RIF for 16 wks (126 doses)
    Or
  – Twice wkly for 18 wks (36 doses)
Post-Treatment Follow-Up

- Patient should receive documentation of
  - TST or IGRA results
  - Radiograph results
  - Dosage and duration of medication
- Present this document any time future testing is required
- Re-educate pts about signs and Sxs of TB
- Regardless of whether Rx for LTBI was completed, serial or repeat CXRs are not indicated unless signs or Sxs of TB develop
Pneumonia Guidelines Refs

- Infectious Diseases Society of America/American Thoracic Society Consensus Guidelines on the Management of Community-Acquired Pneumonia in Adults

- Evidence-based guidelines
  - Graded scientific evidence
  - Strength of recommendations
Answers

1. B
2. B
3. A
4. B
5. B
6. C