Project: Ghana Emergency Medicine Collaborative

Document Title: Pneumonia in the ED

Author(s): Phil Bossart (University of Utah), MD 2012

License: Unless otherwise noted, this material is made available under the terms of the Creative Commons Attribution Share Alike-3.0 License: http://creativecommons.org/licenses/by-sa/3.0/

We have reviewed this material in accordance with U.S. Copyright Law and have tried to maximize your ability to use, share, and adapt it. These lectures have been modified in the process of making a publicly shareable version. The citation key on the following slide provides information about how you may share and adapt this material.

Copyright holders of content included in this material should contact open.michigan@umich.edu with any questions, corrections, or clarification regarding the use of content.

For more information about how to cite these materials visit http://open.umich.edu/privacy-and-terms-use.

Any medical information in this material is intended to inform and educate and is not a tool for self-diagnosis or a replacement for medical evaluation, advice, diagnosis or treatment by a healthcare professional. Please speak to your physician if you have questions about your medical condition.

Viewer discretion is advised: Some medical content is graphic and may not be suitable for all viewers.


**Attribution Key**

for more information see: http://open.umich.edu/wiki/AttributionPolicy

### Use + Share + Adapt

{ Content the copyright holder, author, or law permits you to use, share and adapt. }

- **Public Domain – Government**: Works that are produced by the U.S. Government. (17 USC § 105)
- **Public Domain – Expired**: Works that are no longer protected due to an expired copyright term.
- **Public Domain – Self Dedicated**: Works that a copyright holder has dedicated to the public domain.
- **Creative Commons – Zero Waiver**
- **Creative Commons – Attribution License**
- **Creative Commons – Attribution Share Alike License**
- **Creative Commons – Attribution Noncommercial License**
- **Creative Commons – Attribution Noncommercial Share Alike License**
- **GNU – Free Documentation License**

### Make Your Own Assessment

{ Content Open.Michigan believes can be used, shared, and adapted because it is ineligible for copyright. }

- **Public Domain – Ineligible**: Works that are ineligible for copyright protection in the U.S. (17 USC § 102(b)) *laws in your jurisdiction may differ

{ Content Open.Michigan has used under a Fair Use determination. }

- **Fair Use**: Use of works that is determined to be Fair consistent with the U.S. Copyright Act. (17 USC § 107) *laws in your jurisdiction may differ

Our determination **DOES NOT** mean that all uses of this 3rd-party content are Fair Uses and we **DO NOT** guarantee that your use of the content is Fair.

To use this content you should **do your own independent analysis** to determine whether or not your use will be Fair.
Pneumonia in the ED

Phil Bossart MD
University of Utah
Salt Lake City
Types of Pneumonia

- CAP  community acquired pneumonia
- HAP  hospital acquired pneumonia
- HCAP health care associated pneumonia
Community Acquired Pneumonia

- Indications for Admission to hospital

- PSI  Pneumonia Severity Index

- CURB 65  Confusion, Uremia (BUN > 20mg/dl or 7 mmol/L, RR >30, BP sys <90 or diastolic < 60, Age >65.)
CURB 65

Some use CRB 65
0 – 1 home treatment
1 Admit to hospital
≥ 3 Admit to ICU

Prediction rules are **aids only**
Many other issues (co-morbidities, social factors)
Causes of pneumonia

- Pneumococcus
- Haemophilus influenzae
- Atypical Bacteria (mycoplasma, chlamydia, legionella)
- Oropharyngeal aerobes and anaerobes (asp)
- Resp Viruses
- Staph
- Gram neg bacteria
- TB
Diagnosis of Pneumonia

- Clinical cough, fever, chest pain
- Rales, hypoxia
- Radiologic findings – chest x-ray is not 100% sensitive

- Clinical diagnosis – no single tests gives definitive answer.
These are PA and lateral films of RML pneumonia (arrows). Note the indistinct borders, air bronchograms, and silhouetting of the right heart border. Pneumococcal pneumonia
- Aspiration, no matter what the type, usually occurs in the gravity dependent portions of the lung

**Lower lobes**, especially right-sided, including and especially the superior segments of the lower lobes

- Because of the larger caliber and straighter course of the right main bronchus

**Posterior segments of the upper lobes**

**Aspiration which occurs while the person is prone may be seen in the right upper lobe and middle lobe or the lingula**
Pneumocystis jiroveci (formerly carinii) pneumonia: chest X ray with bilateral, diffuse granular opacities
Mycoplasma pneumonia
Emperic Treatment

- IDSA infectious disease society of america
- ATS american thoracic society
- BTS british thoracic society

- IDSA/ATS: in patient treatment: anti-pneumococcal fluoroquinolone (levofloxicin) or (betalactam plus macrolide)
IDSA/ATS guidelines

If suspect pseudomonas: add piperacillin-tazobactam or imipenem

If suspect MRSA: add vanc or linezolid
British Thoracic Society

- Amoxicillin 500 tid or Doxycycline 200mg load then 100mg q day.

- Much cheaper
Timing of Antibiotics in ED

- Retrospective studies suggested decrease mortality if abx given within 4 hours

- Lead to “standard” in U.S.A. ERs

- Lead to overuse of abx

- Now rec 6 hours
Out patient treatment

- Zithro or doxycycline
- Levofloxacin if sicker patient or more complicated
Aspiration Pneumonia

- Most pneumonia is from “aspiration”

- Larger amount of aspiration causing “pneumonitis”

- Anaerobes are less virulent bacteria
Aspiration Pneumonia

- Reduced consciousness
- Dysphagia
- GERD
- NG feedings

Gastric acid suppression meds – assoc with increased risk of pneumonia
Chemical Pneumonitis

- Aspiration of substances toxic to lungs separate from bacterial infection
- Diagnosis is presumptive based on hx and chest Xray
- Supportive care
- Most do fine but risk of ARDS and pneumonia
Aspiration Pneumonia

- Anaerobic bacteria from gingiva
- More common with poor dentition
- Most commonly evolves slowly
- May present late with lung abscess, empyema, pulmonary necrosis
- Treatment: Clinda or Augmentin or PCN + Metro
Pulmonary TB

- Eighth leading cause of death
- Effective medical therapy for over 50 years yet: lack of access to dx and rx, coexistence with HIV, drug resistance.
- TBI: inhalation, asymptomatic, noninfectious, called latent TB. Will have pos PPD or TST.
Epidemiology

- About one third of population is infected
- About 1.3 million deaths in 2007
- Prevalence is decreasing but slowly
- MDR – TB: resistant to INH or RIF
- XDR – TB: resist to INH, RIF, Fluoroquinolones, and aminoglycosides or Capreomycin.
Primary Pulmonary Tuberculosis

- Symptoms occurring around time of inoculation.
- Generally mild and usually fever.
- Most people are asymptomatic.
- Hilar adenopathy or mid/lower lung infiltrates.
Reactive TB

- Chronic TB, post primary TB, recrudescent TB, endogenous TB

- In USA this is 90% of TB in non HIV patients

- Typically insidious: fever, cough, weight loss, fatigue, night sweats.
Reactive TB

- Chest X ray : apical infiltrates, may see cavities with air fluid levels.
- 5% may have normal Chest x-ray – esp HIV patients
- Endobronchial TB – may mimic asthma
25 year old Indian girl presented with cough and hemoptysis. CXR showed consolidation with cavitations in the right upper zone.
20 year-old female with history of chronic productive cough and weight loss. Pulmonary tuberculosis - Cavitary lesion
Pulmonary Tuberculosis
Ghon Complex
Sub pleural nodule with mediastinal adenopathy.
The Ghon complex is seen here at closer range. Primary tuberculosis is the pattern seen with initial infection with tuberculosis in children. Reactivation, or secondary tuberculosis, is more typically seen in adults.
Widespread hematogenous dissemination of *Mycobacterium Tuberculosis*

So named because the nodules are the size of **millet seeds** (1-5mm with a mean of 2 mm)

Miliary TB represents only 1-3% of all cases of TB
Extra-pulmonary TB

- Lymphadenitis: cervical, mediastinal, axillary nodes
- Pleural TB
- CNS TB
- Peritonitis
- Pericarditis
- Skeletal: Thoracolumbar spine (Potts disease)
- Miliary TB: hematogenous spread
TB Diagnosis

- TST, Mantoux test, PPD
- Diameter of induration at 48-72 hrs.
- Delayed type hypersensitivity
- Takes 2 – 12 weeks to turn positive
- False positives: BCG vaccine, other mycobacterium
- False negatives: anery, advanced age, immune suppression, etc.
TB Diagnosis

- About 10% of immunocompetent people with LTBI will develop TB in lifetime.
- Greatest risk (5%) in first 2 years.
- Serum IGRAs - Interferon gamma release assays – measures IFG release after exposure to M tuberculosis-specific antigens.
TB diagnosis

- Smear microscopy
  - Most rapid and least expensive
- AFB staining
- NNA nucleic acid amplification test
- Culture: liquid 1 – 3 weeks, solid up to 6 weeks
TB treatment

- Latent TB:  INH for 9 months
- Active TB: DOT (direct observation therapy)

  Initial phase of 4 drugs for 2 months followed by 4 – 7 months continuation phase

TB with HIV: Only a few differences.