

# PNEUMONIA

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# Pneumonia

- Main Cause of 90% of Deaths From Respiratory Infection
- Worst M&M in Infants and Older People
- Predominantly Viral Etiology
- Highest Mortality by Bacterial Pathogens

## Global Mortality from Selected Infectious and Parasitic Diseases and Syndromes

<u>Disease</u>	<u># of Deaths</u>	<u>% of all Deaths</u>
Acute lower respiratory infection	3,745,000	7.2
Tuberculosis	2,910,000	5.6
Diarrheal disease	2,455,000	4.7
HIV/AIDS	2,300,000	4.4
Malaria	1,500,000	2.9
Measles	960,000	1.8
Hep B	605,000	1.2
Pertussis	410,000	0.8
Neonatal tetanus	275,000	0.5
Dengue fever	140,000	0.3

*Based on 52.2 million estimated deaths, 1997 estimate*

*From World Health Organization, World Health Report, 1998. Geneva.*

# Port of Entry to Lungs

- ✓ Upper Airway Pathogens
- ✓ Aspiration
- ✓ Inhalation of Infected Aerosolized Materials
- ✓ Seeding From Infected Blood

# Pneumonia

- ✓ Normally, Lungs Are Well Protected
- ✓ Infection Due To:
  - Failure or Defect in *Host Defenses*
  - Exposure to Very *Virulent* Pathogens
  - Exposure to an *Overwhelming Load* of Pathogens

# *Host Defenses*

- ✓ Natural Barriers of the Body
- ✓ Antibodies or Immunoglobulins Production
- ✓ Cellular Immunity by Phagocytosis
- ✓ Soluble Factors

# Failure of Host Defenses

- Absence of Cough or Epiglottic (Gag) reflex
- Dysfunctional Muco-ciliary blanket
- Local production of secretory IgA is reduced

# Failure of Host Defenses

- ✓ Immune Response Stunted:
  - Defective Neutrophil Function
  - Decreased Immunoglobulin Production
- ✓ Prior Viral Infection (Common Cold) Compromises Overall Immunity
- ✓ Systemic Sepsis Weakens Immune Response



# Failure of Host Defenses

- ❖ Immunosuppressive Drugs Decrease Host Response
- ❖ Cigarette/Second-hand Exposure, or Other Toxic Fume Also Weaken Lung System
- ❖ Change in Mental Status (Coma, Seizure, Drug Intoxication)
- ❖

# Clinical Presentation

## Common Signs & Symptoms:

- Cough
- Fever
- Sputum Production
- Shortness of Breath
- Tachypnea/Tachycardia
- Apnea (Common in Newborns)
- Retraction/Flaring/Grunting

# Clinical Presentation

## Common Non-respiratory S&S

- Fever
- Sweating
- Headache
- Nausea/Vomiting (common in young children)
- Irritability
- Anorexia

# Clinical Presentation

## *Uncommon Signs & Symptoms*

- Wheezing
- Decreased Aeration
- Hyper-resonance (Air Trapping)

# Etiologic Pathogens

- Less Than Half of All Cases With Identified Pathogens
- Streptococcus pneumoniae
  - Most common cause of uncomplicated pneumonia in *all* age groups (except Newborns)
- Atypical Bacteria
  - Mycoplasma
  - Chlamydia

## Etiologic Agents of Acute Uncomplicated Pneumonia in Children

<u>Age Group</u>	<u>Etiologic Agents</u>
<b>&lt; 1 month</b>	Group B Strep, <i>E. coli</i> , <i>L. monocytogenes</i> , <i>S. pneumoniae</i> , other gram-negative bacilli
<b>1-3 months</b>	Respiratory viruses, <i>S. pneumoniae</i> , cytomegalovirus, <i>C. trachomatis</i> , <i>U. urealyticum</i>
<b>3 months – 5 years</b>	Respiratory viruses, <i>S. pneumoniae</i> , <i>M. pneumoniae</i> , <i>S. aureus</i>
<b>&gt; 5 years</b>	Respiratory viruses, <i>M. pneumoniae</i> , <i>C. pneumoniae</i> , <i>S. pneumoniae</i>

*M. Tuberculosis should be considered in all children where it is endemic or there is contact with others who are infected*

# Diagnosis

- ✓ Clinical History & Exam
- ✓ Chest X-ray
- ✓ Sputum Analysis
- ✓ Visual Bronchoscopy
- ✓ Bronchial Lavage

# Treatment

- ✓ Appropriate Antibiotics
- ✓ Oxygen Support
- ✓ Bronchodilator
- ✓ Humidity With Mist Tent
- ✓ Percussion & Postural Drainage
- ✓ Hydration/Fever Control/Nutritional Support



## Guide to Empiric Antibiotic Therapy for Acute Uncomplicated Pneumonia

<u>Patient Age / Circumstance</u>	<u>Anti-infective Agent</u>	<u>Duration</u>
Neonate	Ampicillin + aminoglycoside Consider adding Methicillin <sup>a</sup>	10-14 days
1-3 months	Ampicillin Consider adding Nafcillin or using <sup>a</sup> Cefuroxime alone Consider adding Erythromycin <sup>b</sup>	10-14 days
3 months – 5 years	Ampicillin Consider adding Nafcillin or using Cefuroxime alone <sup>a</sup> Consider adding Erythromycin <sup>c</sup>	7-10 days
> 5 years	Erythromycin Consider adding Ampicillin or Cefuroxime <sup>d</sup>	7 days
Aspiration pneumonia Community acquired Hospital acquired	Ampicillin or Penicillin Ampicillin or Penicillin	7-10 days 10-14 days

# Key To Chart

- a = if clinical setting suggests possible staphylococcal infection
- b = if clinical setting suggests possible *C. trachomatis* infection
- c = if clinical setting suggests *M. pneumoniae* or *C. pneumoniae* infection
- d = for ill inpatient with bacterial pneumoia likely



***THANK YOU!***