

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>
< 1 month	Group B Strep, <i>E. coli</i> , <i>L. monocytogenes</i> , <i>S. pneumoniae</i> , other gram-negative bacilli
1-3 months	Respiratory viruses, <i>S. pneumoniae</i> , cytomegalovirus, <i>C. trachomatis</i> , <i>U. urealyticum</i>
3 months – 5 years	Respiratory viruses, <i>S. pneumoniae</i> , <i>M. pneumoniae</i> , <i>S. aureus</i>
> 5 years	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 ^a	10-14 days
1-3 months	Ampicillin Consider adding Nafcillin or using ^a Cefuroxime alone Consider adding Erythromycin ^b	10-14 days
3 months – 5 years	Ampicillin Consider adding Nafcillin or using Cefuroxime alone ^a Consider adding Erythromycin ^c	7-10 days
> 5 years	Erythromycin Consider adding Ampicillin or Cefuroxime ^d	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!