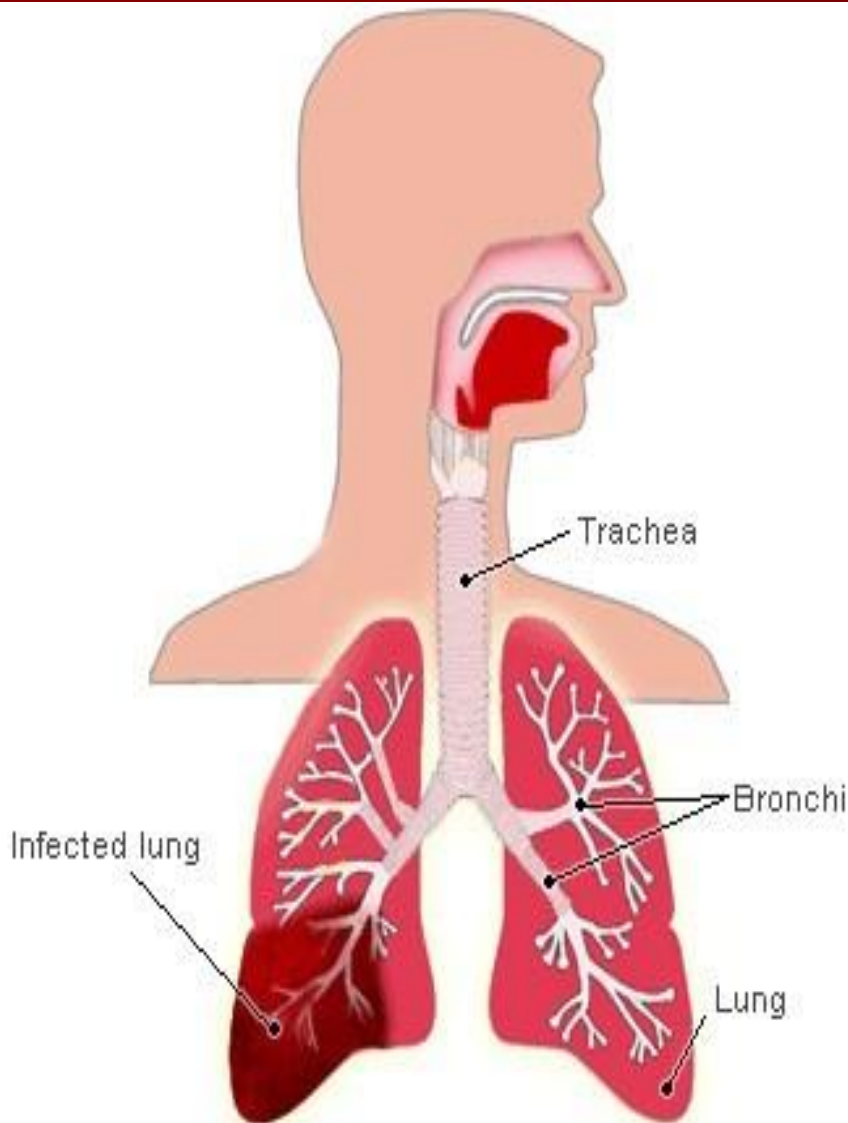


COMMUNITY ACQUIRED PNEUMONIA

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GROUP NO- LA2 173(2)

Pneumonia - Definition

- **Pneumonia** is an abnormal inflammatory condition of the lung. It is often characterized as including inflammation of the parenchyma of the lung (that is, the alveoli) *and* abnormal alveolar filling with fluid (consolidation and exudation)



Community Acquired Pneumonia

- **Definition:**

Acute infection of the pulmonary parenchyma that is associated with at least some symptoms of acute infection, accompanied by the presence of an acute infiltrate on a chest radiograph, or auscultatory findings consistent with pneumonia, in a patient not hospitalized or residing in a long term care facility for ≥ 14 days before onset of symptoms.

Community-Acquired Pneumonia (CAP)

- Community-acquired pneumonia refers to pneumonia acquired outside of hospitals or extended-care facilities.
- Community-acquired pneumonia (CAP) is one of the most common infectious diseases diagnosed by clinicians.



Why Community Acquired Pneumonia is a Important disease

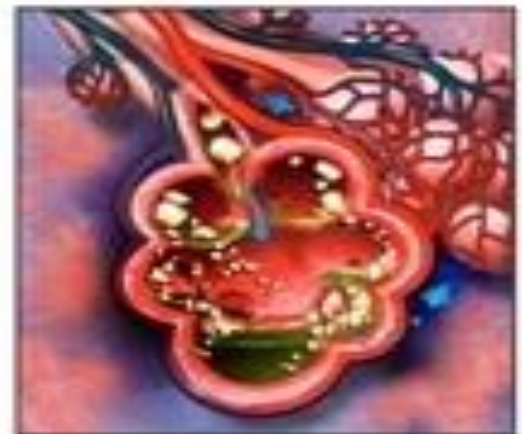
Community-Acquired Pneumonia (CAP)

Epidemiology



- Sixth leading cause of death
- Leading cause of death due to infectious disease
- More than 3 million cases of CAP per year
- 500,000 hospitalizations per year
- 45,000 deaths per year
- Cost: \$21 billion

CAP causes major changes in the Functional physiology of the Respiratory tract



Who Develops Community Acquired Pneumonia

- Community-acquired pneumonia develops in people with limited or no contact with medical institutions or settings.
- CAP occurs throughout the world and is a leading cause of illness and death



Community Acquired Pneumonia

- **Risk Factors for pneumonia**
 - age
 - alcoholism
 - smoking
 - asthma
 - Immuno suppression
 - institutionalization
 - COPD
 - dementia

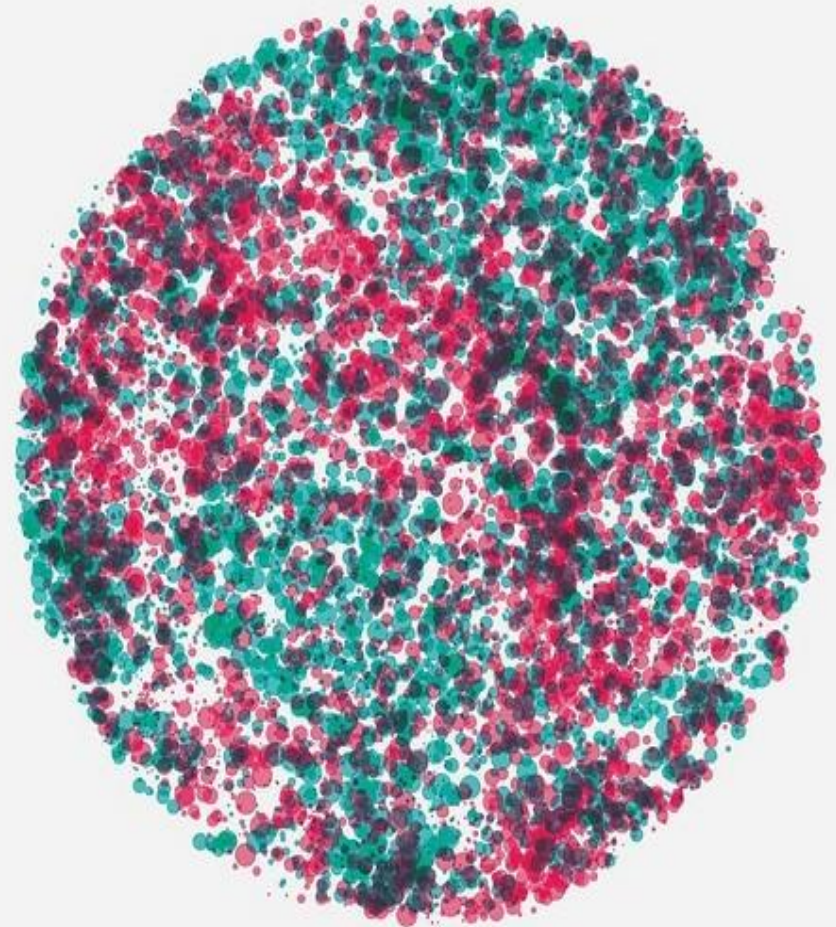
Community acquired pneumonia

Emerging Health Problem

- **Causes of CAP** - Bacteria, viruses, fungi, and parasites. CAP can be diagnosed by symptoms and physical examination alone, though x-rays, examination of the sputum, and other tests are often used. Individuals with CAP sometimes require hospitalization and treatment in a hospital.

Several Microbes can cause CAP

- The most commonly identified pathogens are **Streptococcus pneumoniae**, **Haemophilus influenzae**, and **atypical organisms (i.e., Chlamydia pneumoniae, Mycoplasma pneumoniae, Legionella sp.)**.



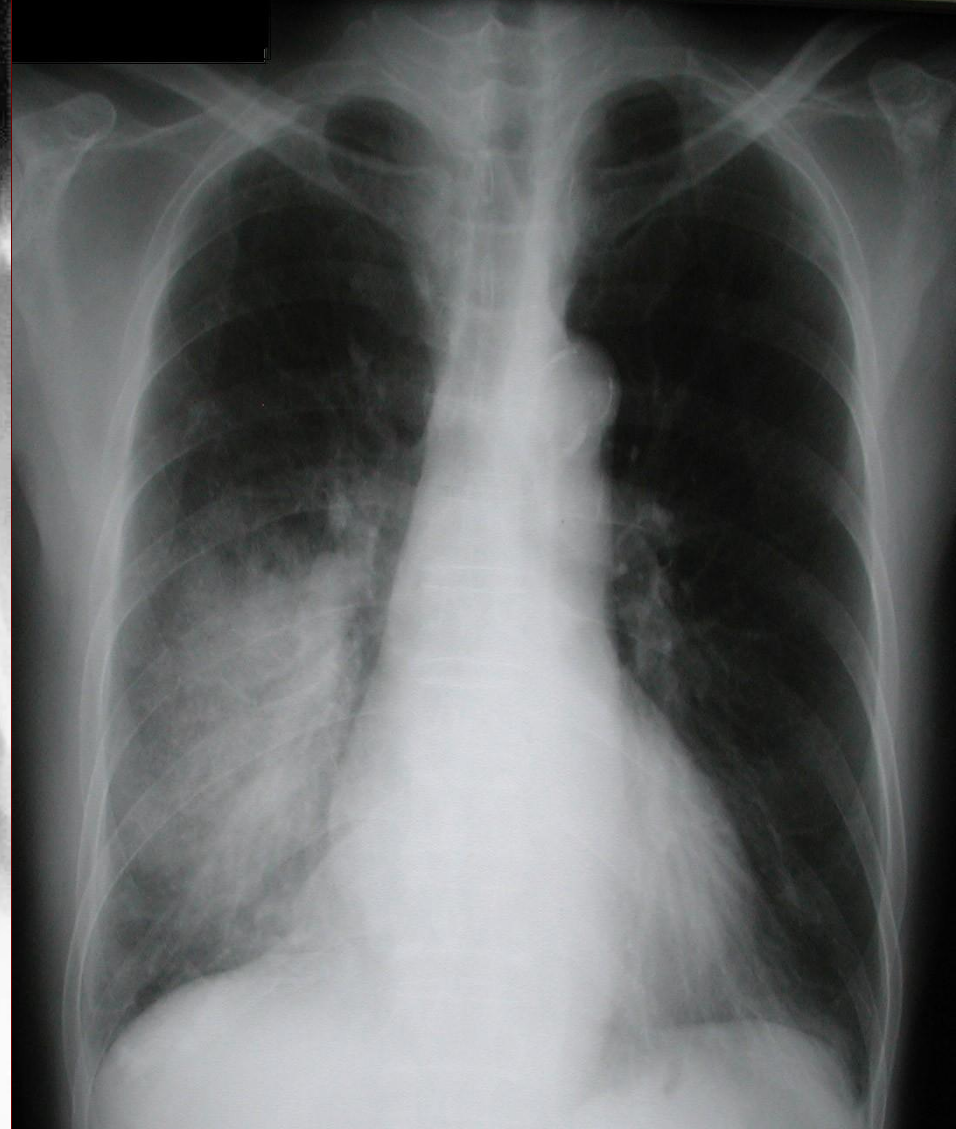
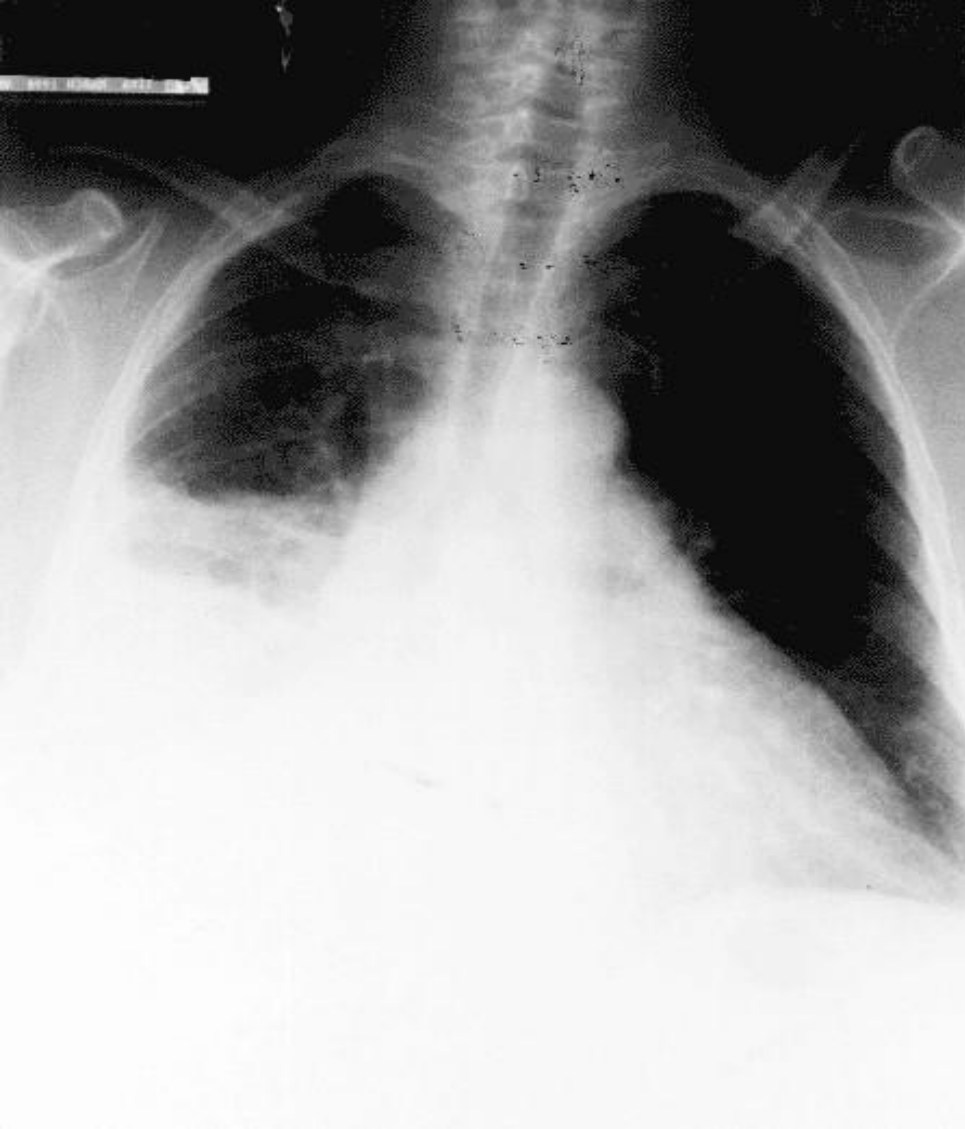
Typical x Atypical etiological agents

- *Typical pneumonia usually is caused by bacteria such as Streptococcus pneumoniae.*

Atypical pneumonia usually is caused by the influenza virus, mycoplasma, Chlamydia, Legionella, adenovirus, or other unidentified microorganism.

The patient's age is the main differentiating factor between typical and atypical pneumonia; young adults are more prone to atypical causes, and very young and older persons are more predisposed to typical causes.

X ray chest gives the leading clues in Diagnosis



Pathophysiology

- CAP is usually acquired via inhalation or aspiration of pulmonary pathogenic organisms into a lung segment or lobe. Less commonly, CAP results from secondary bacteraemia from a distant source, such as *Escherichia coli* urinary tract infection and/or bacteraemia. CAP due to aspiration of Oropharyngeal contents is the only form of CAP involving multiple pathogens.

Etiological agents in Community-acquired in Children

From Birth to 3 weeks

- Group B streptococci,
Listeria
Monocytogenes,
gram-negative bacilli,
cytomegalovirus



From 3 weeks to 3 months



- Streptococcus pneumoniae, viruses (RSV, Parainfluenza viruses, metapneumovirus), Bordetella pertussis, Staphylococcus aureus, Chlamydia trachomatis (trans natal exposure)

From 4 months to 4 years

- *S. pneumoniae*,
viruses
(RSV, Parainfluenza viruses, influenza viruses, adenovirus, rhinovirus, metapneumovirus),
- *Mycoplasma pneumoniae* (in older children), group A streptococci



5 years to 15 years



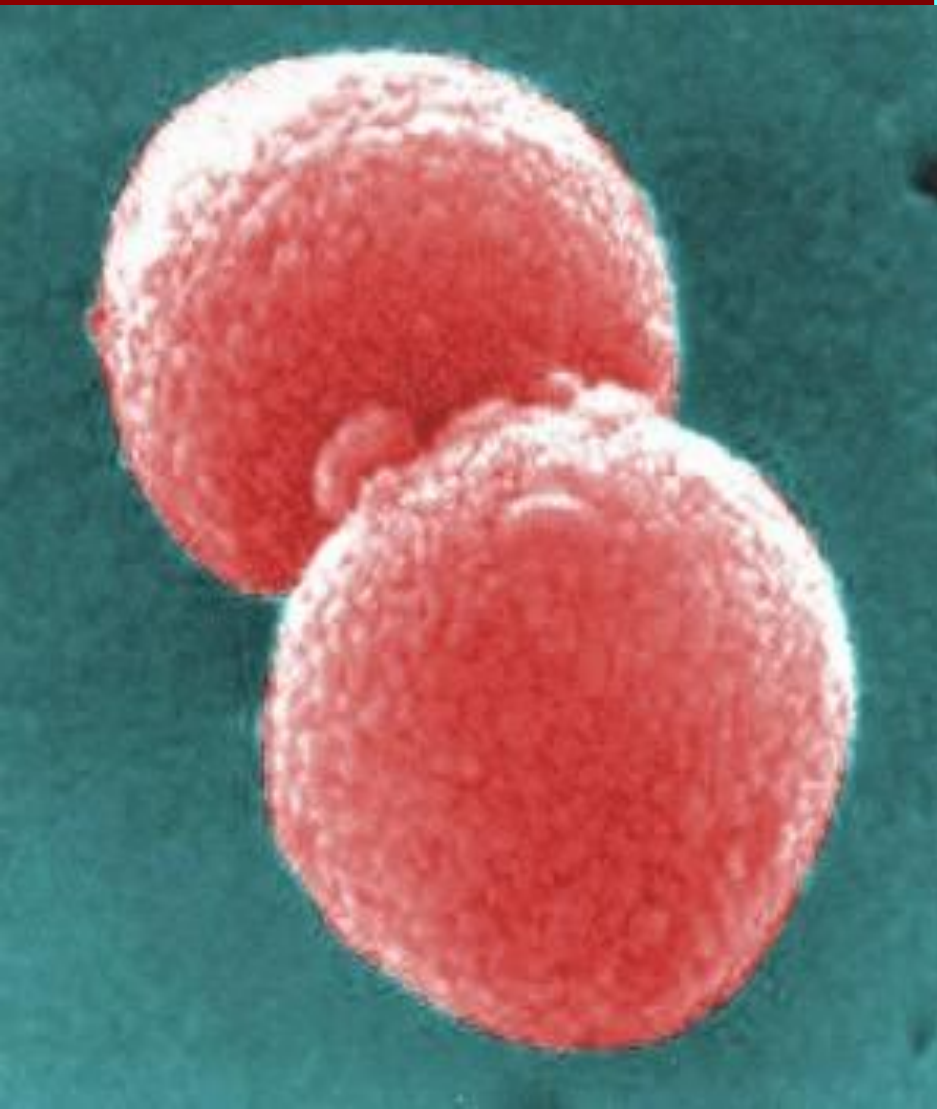
- **S. pneumoniae,**
- **M. pneumoniae,**
and
Chlamydia
pneumoniae

COMMUNITY-ACQUIRED PNEUMONIA IN ADULTS

Outpatients—with no modifying factors present

- *Streptococcus pneumoniae*,
- *Mycoplasma pneumoniae*, *Chlamydia pneumoniae*,
- *Haemophilus influenzae*, respiratory viruses,
- miscellaneous
(*Legionella* sp, *Mycobacterium tuberculosis*, endemic fungi)

Outpatients—modifying factors



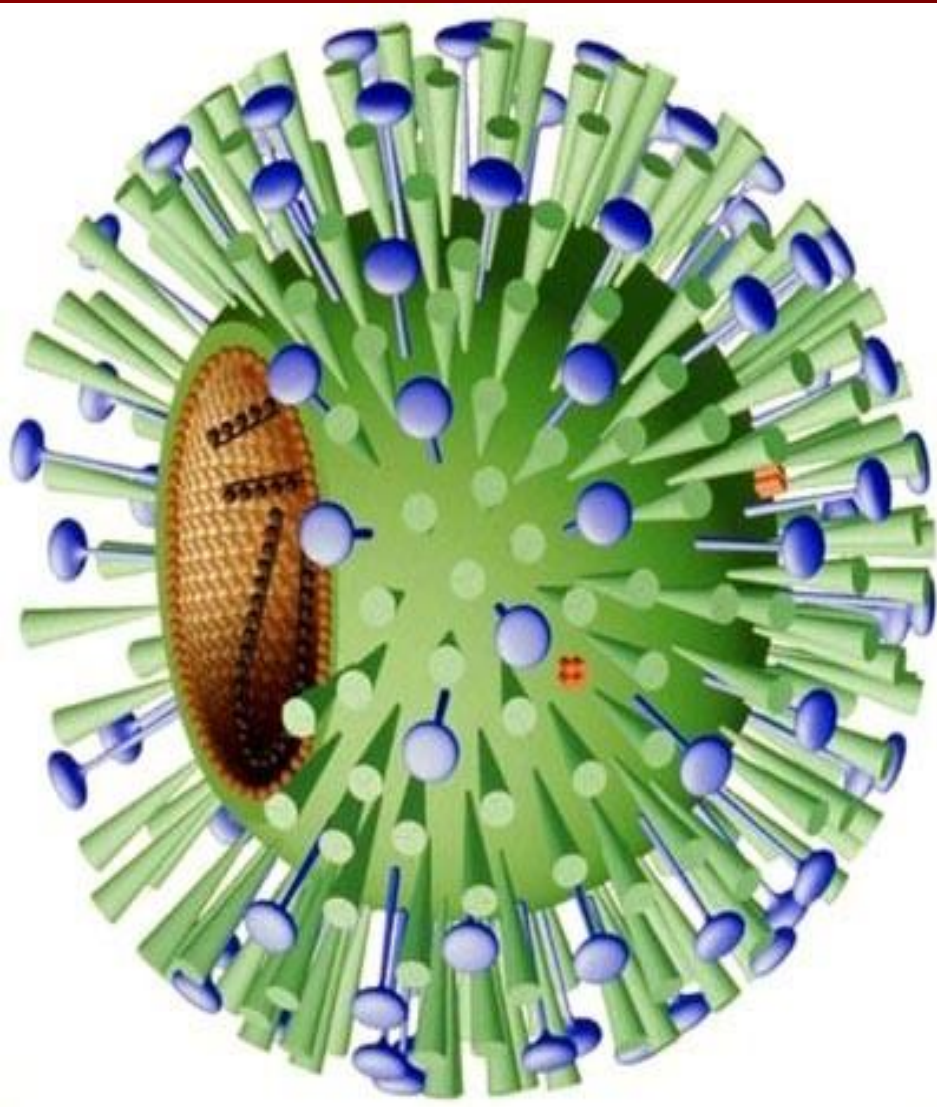
- *S. pneumoniae*, including drug resistant forms; *M. pneumoniae*;
- *C. pneumoniae*; mixed infection (bacteria + atypical pathogen or virus); *H. influenzae*; enteric gram-negative organisms; respiratory viruses; miscellaneous (*Moraxella catarrhalis*, *Legionella* sp, anaerobes [aspiration], *M. tuberculosis*, endemic fungi)

CAP in Inpatients not admitted in ICU

- *S. pneumoniae*, *H. influenzae*;
C. Pneumonia;
C. pneumoniae; mixed infection (bacteria + atypical pathogen or virus); respiratory viruses; *Legionella* sp, miscellaneous (*M. tuberculosis*.



Non-bacterial pathogens causing CAP



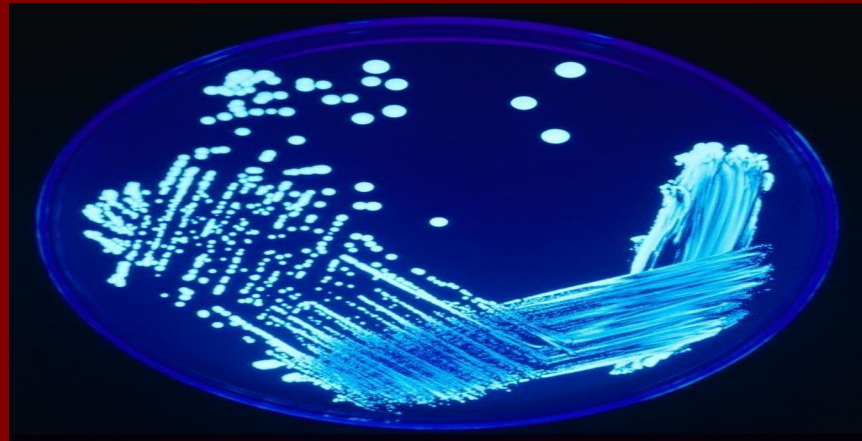
- *Non bacterial* pathogens in the differential include many viruses (influenza, adenovirus, rhinovirus, etc.) and fungi (*Aspergillus* spp., *Candida* spp., *Coccidioides immitis*, etc.)

Value of chest x-ray in Diagnosis of CAP



- A chest x-ray is recommended to make the diagnosis of pneumonia
An imperfect gold standard
- No studies specifically demonstrate improved patient outcomes through use of chest x-ray in adults

Microbiological Diagnosis



Common Laboratory Tests

- Common laboratory tests for pneumonia have included leukocyte count, sputum Gram stain, two sets of blood cultures, and urine antigens. However, the validity of these tests has recently been questioned after low positive culture rates were found (e.g., culture isolates of *S. pneumoniae* were present in only 40 to 50 percent of cases).



Microbiological diagnosis is confirmatory

- Is not possible to distinguish the causative organisms of pneumonia other than by microbiology as no pathogen leads to a clinical, laboratory or radiological pattern sufficiently characteristic to be the basis of a confident diagnosis, but clinical symptoms and epidemiological features may provide clues to the aetiology as some differences in presentation do occur.

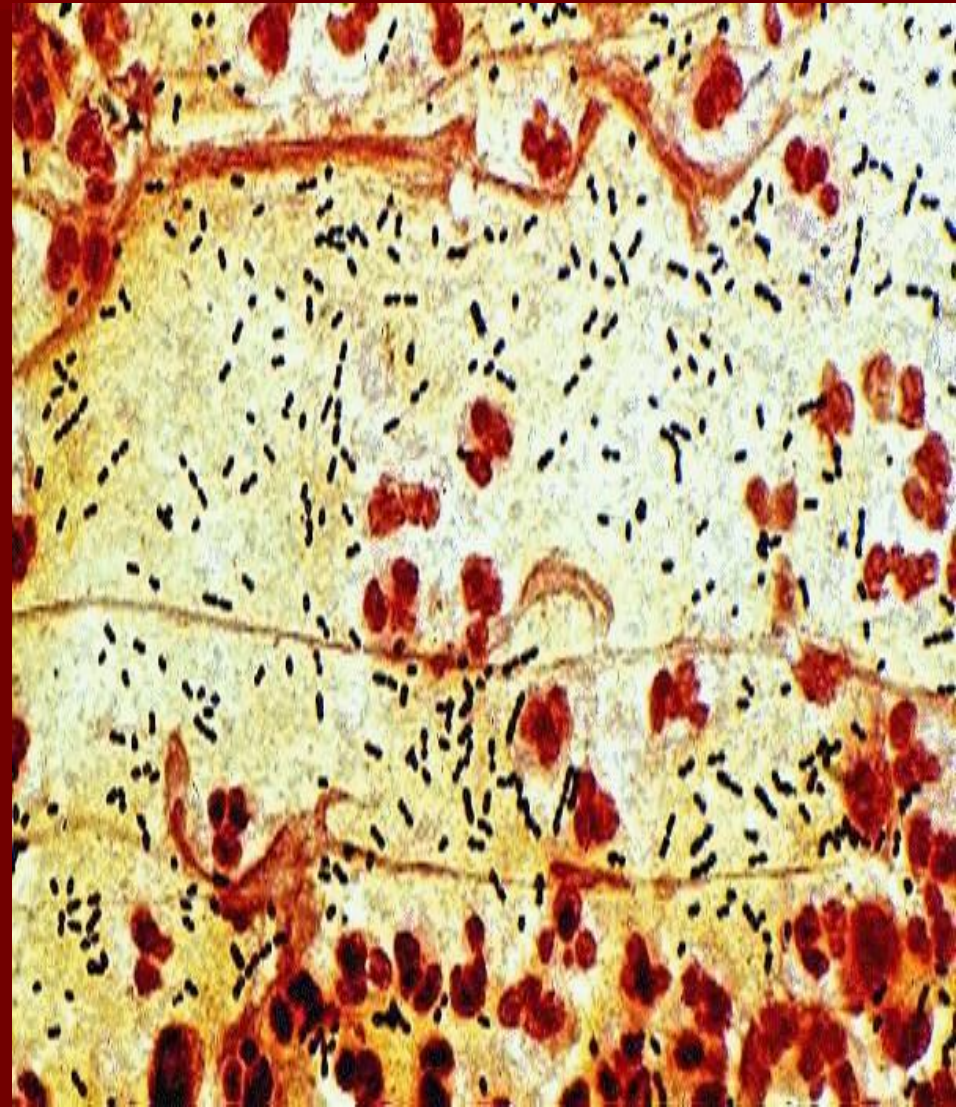
Bacteriological Investigations on sputum



- Expecterated sputum collected (poorly collected) without proper instructions may not yield optimal results

Sputum gram staining and culture

- A good quality sputum sample with a predominant pus cells with proportionately less epithelial cells and bacterial pathogens can be observed in approximately 15% of the cases studied



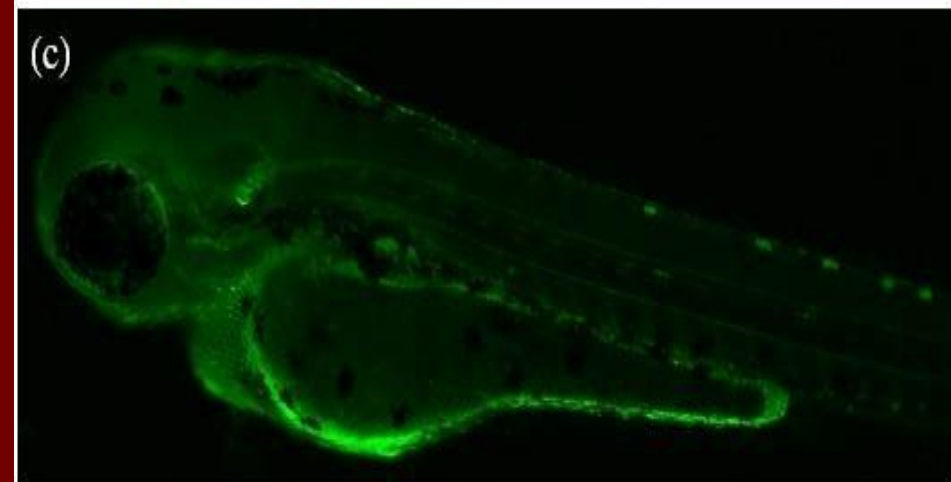
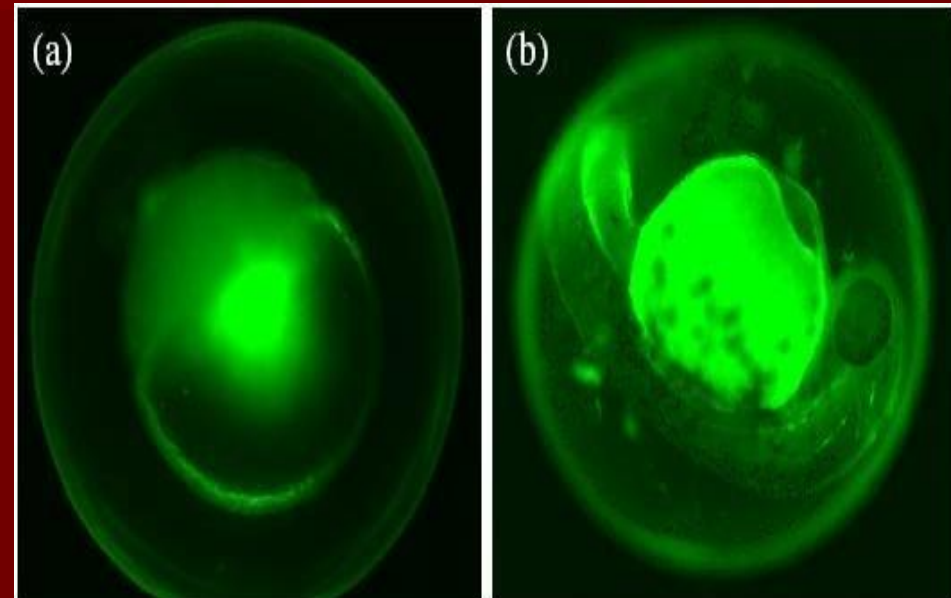
Newer methods – Diagnosis of Community associated Pneumonias

- Antigen detection in sputum urine by **Fluorescent methods**

Immunoelectrophoresis

Latex agglutination tests

ELISA



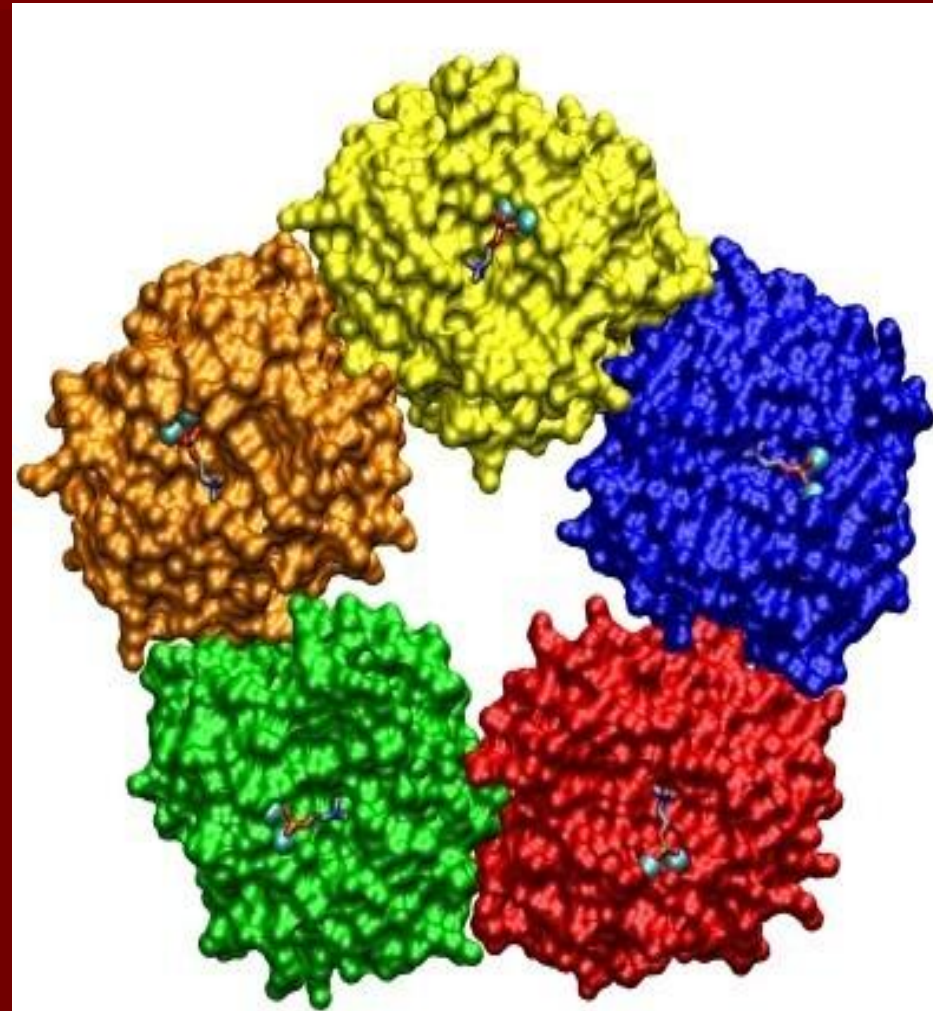
Diagnosis in cases of Atypical pneumonias



- By serological methods using acute and convalescent sera
- Raise of significant titer or rising titer of antibodies give clues to diagnosis.

Other markers suggestive of CAP

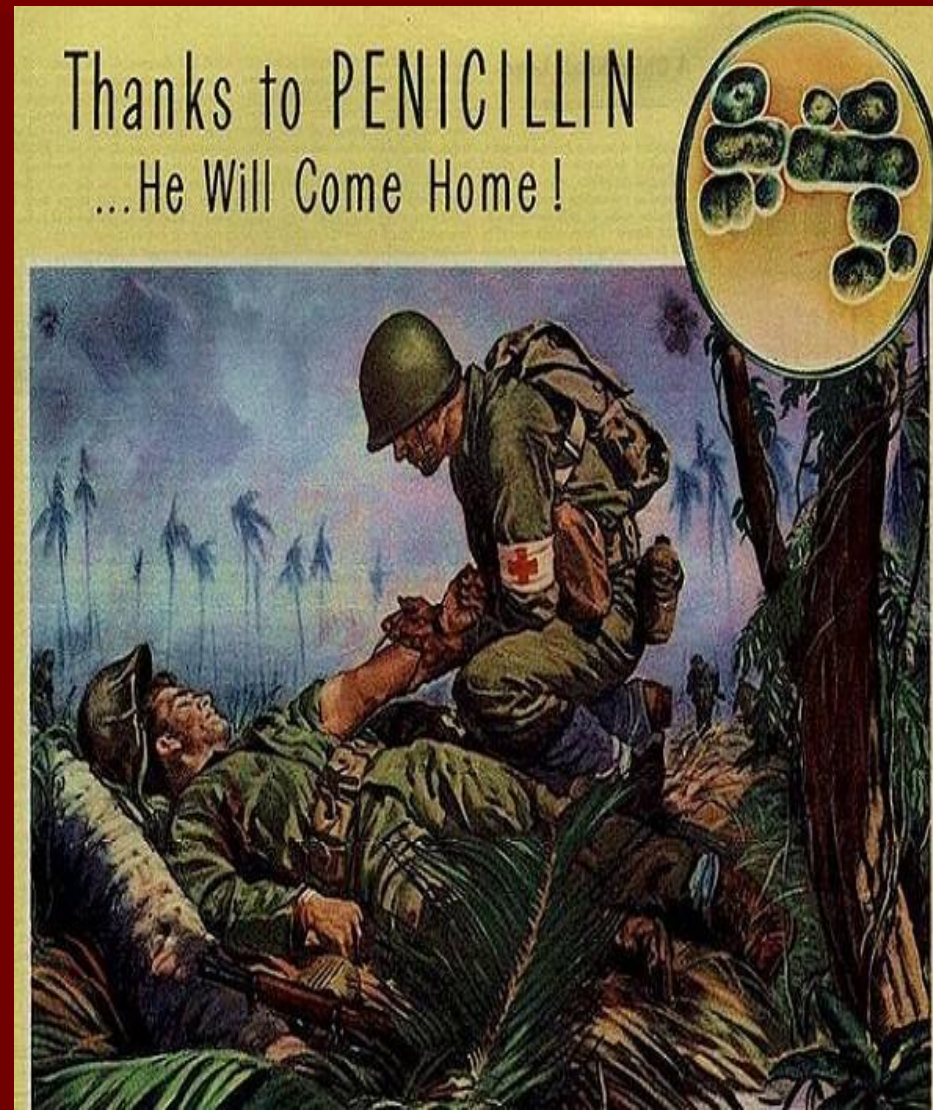
- **C - reactive protein** trends have been correlated to clinical progress in CAP, and administration of its activated form (**drotrecogin alpha**) appears to reduce mortality in severe sepsis.



Pencillin still continues to be preferred antibiotic

- With a bloodstream or lung infection, you can get a much higher concentration of antibiotic to the site of the infection. Because of that, you can use a standard agent, such as penicillin, even when there is some resistance,"

Dr. Whitney.



Antimicrobial therapy – Empirica approach

- Antimicrobial therapy is the mainstay of management for community-acquired pneumonia (CAP). Accordingly, the choices of treatment are influenced by the likely aetiologies, local resistance patterns of the pathogens, as well as patient factors. As the leading cause of acute CAP, the susceptibility patterns of *Streptococcus pneumoniae* have greatly influenced antimicrobial agents and dosage recommended for empirical treatment of this condition.

MRSA – a concern in treating Community acquired Pneumonias

- The worldwide emergence of community-acquired Methicillin-resistant *Staphylococcus aureus* has also led to discussion of this pathogen in recent revisions of the international CAP guidelines.



Vaccination in children

- Vaccination is important in both children and adults. Vaccinations against *Haemophilus influenzae* and *Streptococcus pneumoniae* in the first year of life have greatly reduced their role in CAP in children



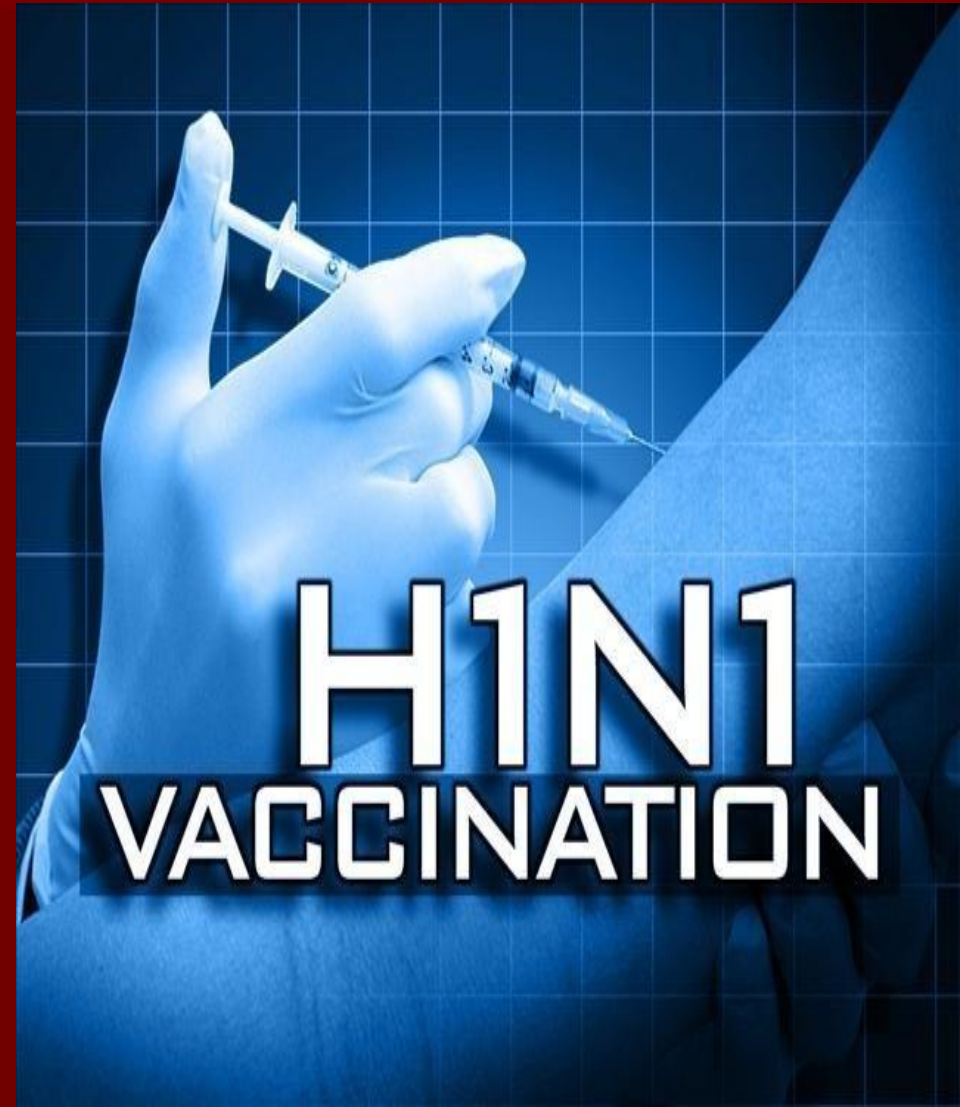
Community Acquired Pneumonia and Vaccination for Pneumococcal infection

- ✓ The pneumococcal vaccine (the 'pneumonia shot') protects against 23 types of pneumococcal bacteria.
- ✓ Research proves the vaccine is not 100% effective in preventing pneumonia, but found that if you are vaccinated you are less likely to die from pneumonia.



Preventing Influenzae

- According to the U.S. Centers for Disease Control and Prevention (CDC), anyone who wants to reduce their risk of getting the flu should have a flu vaccine.
- Older children and adults require only a single shot each year. However, children under age 9 may need two doses



General Health Measures



- Smoking cessation is important not only for treatment of any underlying lung disease, but also because cigarette smoke interferes with many of the body's natural defences against CAP.

Future goals on reducing child deaths – by Hand washing

- **Handwashing with soap** is among the most effective and inexpensive ways to prevent diarrheal diseases and **pneumonia**, which together are responsible for the majority of child deaths. a significant contribution to meeting the Millennium Development Goal of reducing deaths among children under the age of five by two-thirds.



THANK YOU