Mycoplasma
Legionella

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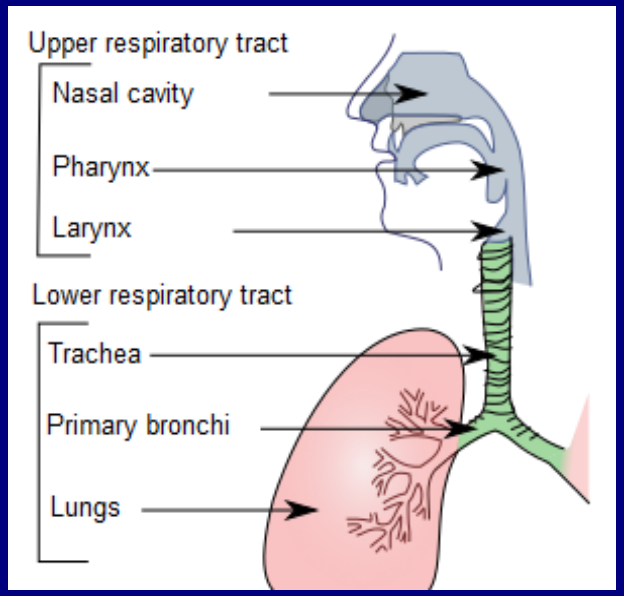
- Upper respiratory tract (URT)
  - Sinuses
  - Middle ear
  - Naso/Oropharynx
- Lower respiratory tract (LRT)
  - Trachea
  - Bronchi
  - Bronchioles
  - Alveoli/alveolar macrophages and lung tissue



Classification of rspiratory tract infections

- Upper *vs.* lower resp. tract infection

- Community acquired pneumoniae (CAP), H (Hospital) AP (gram negative and resistant organisms), Aspiration (anaerobics).
- Typical (strep. pneumonia) vs. atypical (legionella, mycoplasma)

- Causative infectious organism:

- ✓ Viral
- ✓ Bacterial: typical and atypical
- ✓ Fungal…

- Legionella

Medium

The Mysterious Outbreak That Changed The CDC Forever.

Related images

See more

- *Legionella*

- Legionella was responsible for respiratory disease (pneumonia) in persons attending an American legion convention in Philadelphia.

- It caused legionnaire's disease which is a severe respiratory illness first recognized in 1976.

- Weak gram negative bacilli
- LPS, penicillinase, protease, cytotoxins and hemolysins
- Catalase +,oxidase +

- *L. pneumophila*

- There are several species of Legionella:
  -Legionella pneumophila: the most important, cause Legionnaire's disease & pontiac fever.
- Incubation: 2-10 days
- Transmitted by inhalation of Water droplets from Air conditions, towers, stagnant water, resp. physiotherapy units
- No person to person spread
- Lives in temperature 20-55C

SHOWERS

Poor hygiene

Infrequently used

Create aerosol

Nemco
UTILITIES

DEAD LEGS

Stagnant water

Nemco UTILITIES

STORAGE TANKS

- Stagnation
- Out of sight
- Poor flow
- Ambient temps

Nemco UTILITIES

Nemco
UTILITIES

Nemco
UTILITIES

- *L. pneumophila*

➢ 1-Pneumonia known as legionnaires' disease with hyponatremia and confusion commonly associated

- Common in smokers & immunocompromised
- Mortality rate > 10% in healthy people

➢ 2-Less serious influenza-like illness called Pontiac fever

Diagnosis

- Specimens : the organisms can be recovered bronchial washing, pleural fluid, lung biopsy or blood (From sputum the isolation is more difficult).

- Buffered charcoal yeast extract agar (BCYE), which contains iron plus cysteine as an essential growth factor (colonies have cut glass appearance under micropscope) – positive growth after 5 days

- Antigen detection in urine

Legionellae on BCYE medium

Treatment:

Macrolides is the first line (azithromycin, erythromycin..)

Control:

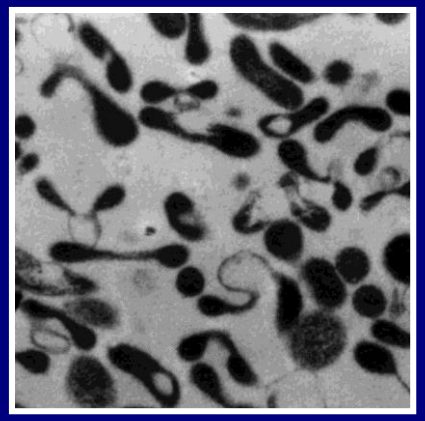
No vaccine but chlorinating and heating water

Family: *Mycoplasmataceae*

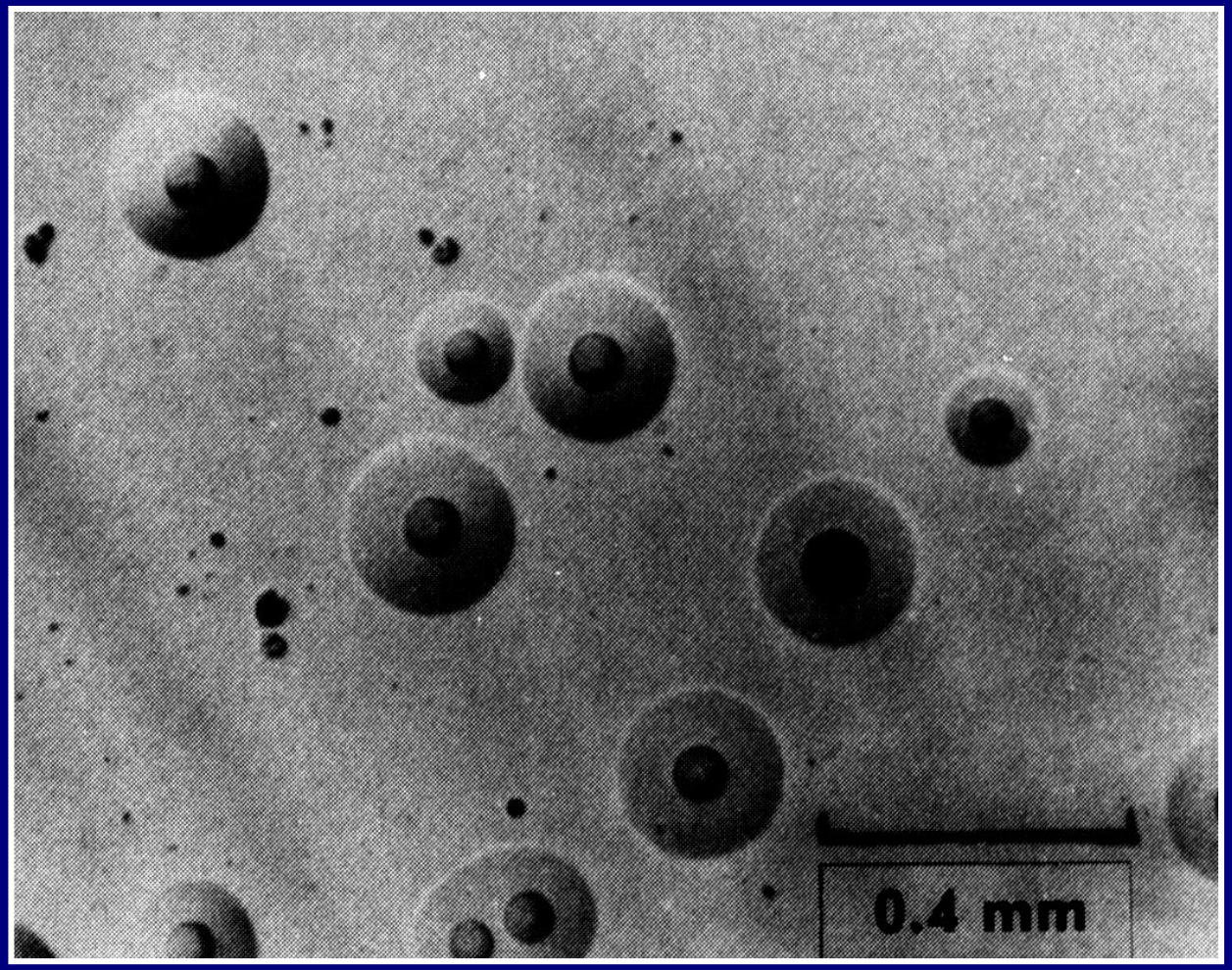
- Genus: *Mycoplasma*
  - Species: *M. pneumoniae*
  - Species: *M. hominis*
  - Species: *M. genitalium*
- Genus: *Ureaplasma*
  - Species: *U. urealyticum*

Morphology and Physiology

- Smallest free-living bacteria (0.2 - 0.8 µm)
  - Require complex media for growth, PPL4.
- Lack a cell wall?
- Part of Normal flora
- P1 antigen: antibodies Bind to RBCs I antigen?



“Fried Egg” Colonies of Mycoplasmas



Mycoplasma pneumoniae

- Tracheobronchitis
- Atypical pneumonia (walking pneumonia)
- Occurs worldwide
- Proportionally higher in fall and winter

Clinical Syndrome - *M. pneumoniae*

- Incubation - 2-3 weeks (respiratory transmission)
- Low grade Fever, headache and malaise
- Persistent non-productive cough, wheeze
- Slow resolution
- Rarely fatal

Laboratory Diagnosis - *M. pneumoniae*

- Microscopy
  - Difficult to stain
  - Can help eliminate other organisms
- Culture (definitive diagnosis)
  - ➢ May take 2-3 weeks
- Serology: ELISA to detect antibodies rise in 2 weeks
- PCR
- Others: History, Ex, CXR…

Treatment and Prevention *M. pneumoniae*

- Usually self limited in 3-10 days
- Treatment
  - Azithromycin,Erythromycin (macrolides) or
  - New fluoroquinolones
  - Can't use cell wall synthesis inhibitors
- Prevention: No vaccine, so….

The End