

A scanning electron micrograph (SEM) showing a dense population of rod-shaped bacteria, characteristic of Pasteurella multocida, the causative agent of fowl cholera. The bacteria are arranged in various patterns, including chains and clusters, and are surrounded by a network of fine, fibrous structures. The overall appearance is highly detailed and textured.

**Fowl cholera**

# Plan of Talk

- **Introduction**
- Predisposing factors
- Incidence and distribution
- Etiology
- Transmission
- Clinical signs
- Post mortem lesions
- Diagnosis
- Treatment
- Prevention

# Synonyms

Avian Cholera

Avian Pasteurellosis

Avian Hemorrhagic septicemia

Kolera Unggas (INA)

# Cont. ...

- Fowl cholera is a contagious, bacterial disease that affects domestic and wild birds worldwide, caused by **Pasteurella multocida type A**.
- It usually occurs as a **septicemia** of sudden onset with **high morbidity and mortality**, but chronic and asymptomatic infections also occur.

# Cont. ...

- **Turkeys** and waterfowl are **more susceptible** than **chickens**.
- **Older chickens** are more susceptible than **young ones**.

# Cont. ...

## Pathogenic Pasteurella species are:

1. **Pasteurella multocida type A**
  - Fowl Cholera in chicken.
2. Pasteurella multocida type B
  - Septicemia epizootica or Hemorrhagic septicemia in ruminant.
3. Pasteurella haemolytica
  - Pneumonia Pasteurellosis in Cattle.

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# Predisposing Factors

**Fowl Cholera is closely related to some stress factor;**

1. Change of weather, fluctuation of temp, humidity....ect.
2. Move to new cage.
3. Debeaking.
4. Alteration of food suddenly.
5. Exhaustion.
6. Over crowding.
7. Transport in long time with lack of drink.

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# Incidence & Distribution



- Fowl cholera occurs **sporadically** or **enzootically** in most countries.
- It sometimes causes high mortality; at other times, losses are nominal.

# Cont. ...

- Fowl cholera is more prevalent in **late summer, fall, and winter**.
- Chickens become more susceptible as they reach **maturity**.

# Cont. ...

## Acute from;

- Alberts and Graham reported a loss of **68%** within **6 days** in a flock of **52 month old turkeys**.
- Vaught et al. reported that more than **1,000 wild geese died of FC in one night**.

## Chronic from;

- In studying the **chronic respiratory form** in chickens, Hall et al. observed that mortality was **low**, but infection persisted for at **least 4 years**.

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# Etiology

- The genus *Pasteurella sensu stricto* includes at least 11 species.
- Only 7 species have been associated with avian hosts.
- Among these 7 species, *P. multocida* is considered the causative agent of fowl cholera.

# Cont. ...

## *Pasteurella multocida*

- Small, gram-negative.
- Non-motile rod with a capsule that may exhibit pleomorphism (the ability of some bacteria to alter their shape or size in response to environmental conditions) after repeated subculture.
- The organism is susceptible to ordinary disinfectants, sunlight, drying, and heat.

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# Transmission

**Transmission occur through:**

1. Oral
2. Inhalation

# Cont. ...

## **Indirect contact:**

Through food/drink, tools/materials which were contaminated by the agents, animals transmitted and wind.

## **Direct Contact:**

Through discharges and feces.

# Cont. ...

- Chronically infected birds and asymptomatic carriers are considered to be major sources of infection.
- Wild birds may introduce the organism into a poultry flock, but mammals (including rodents, pigs, dogs, and cats) may also carry the infection.

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# Clinical Signs

Clinical findings vary greatly depending on the course of disease:

1. Acute
2. Chronic

# Cont. ...

## In acute fowl cholera,

1. Sudden surges in mortality, **without previous signs.**
2. Fever.
3. Loss of appetite.
4. Ruffled feathers.
5. Mucous discharge from the mouth.
6. Green watery diarrhea.
7. Respiratory difficulty.
8. Blue or purple coloration of skin and swelling of comb and wattles.
9. Pneumonia is particularly common in turkeys.



Mucoïd discharge

1



Swollen wattles  
Blue/ purple coloration



Swollen wattles

Cornell University



Swollen wattles

Dr. Jaime Ruiz



**Swollen wattles**

**Dr. Jaime Ruiz**



Swollen face

Swelling  
(infraorbital sinuses)



Cornell University

**Swelling (ear)**



**Dr. Jaime Ruiz**

# Clinical Signs

## Chronic fowl cholera,

1. Signs and lesions are generally related to localized infections of wattles, joints, tendon sheaths, and footpads, which often are swollen because of accumulated fibrinosuppurative exudate.
2. There may be exudative conjunctivitis and pharyngitis.
3. Torticollis (abnormal, asymmetrical head or neck position) may result when the meninges, middle ear, or cranial bones are infected.

Torticollis



Cornell University

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# Post Mortem Lesions

In **per acute** and **acute** forms;

1. The disease shows **primarily vascular disturbances.**
  1. General passive hyperemia and congestion throughout the carcass.
  2. Petechial and ecchymotic hemorrhages are common, particularly in subepicardial and subserosal locations.
2. Enlargement of the liver and spleen.
3. Increased amounts of peritoneal and pericardial fluids are frequently seen.

# Cont. ...

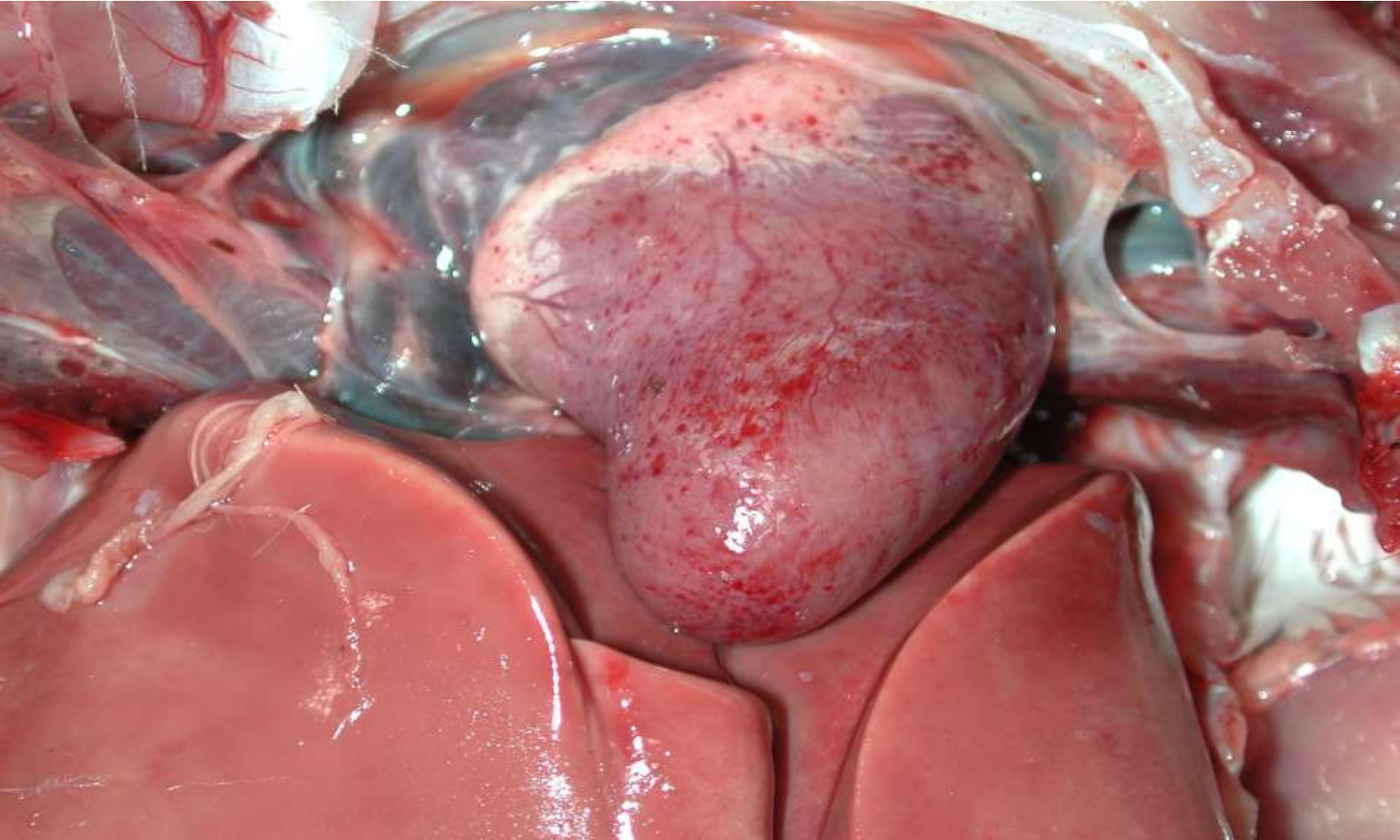
In **sub acute** forms;

1. Multiple, small, necrotic foci may be disseminated throughout the liver and spleen.

# Cont. ...

## In chronic forms of fowl cholera;

1. **Suppurative lesions** may be widely distributed, often involving the **respiratory** tract, the **conjunctiva**, and adjacent tissues of the head.
2. Caseous arthritis and productive inflammation of the peritoneal cavity and the oviduct.
3. Fibrinonecrotic dermatitis, includes caudal parts of the dorsum, abdomen, and breast and involves the cutis, subcutis, and underlying muscle has been observed in turkeys and broilers.
4. Sequestered necrotic lung lesions in poultry should always raise suspicion of cholera.



**Petechiae in the heart of goose**  
(pasteurellosis, erysipelas, asphyxia)



**Necrotic foci in the liver - goose**  
(pasteurellosis, erysipelas)



Liver - Multiple, small,  
necrotic foci



**Green feces in Fowl Cholera, nonspecific sign.**

**Many disease in fowl reveal defecating with green feces**

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# Diagnosis

Although the history, signs, and lesions may aid diagnosis, *P. multocida* should be isolated, characterized, and identified for confirmation.

# Plan of Talk

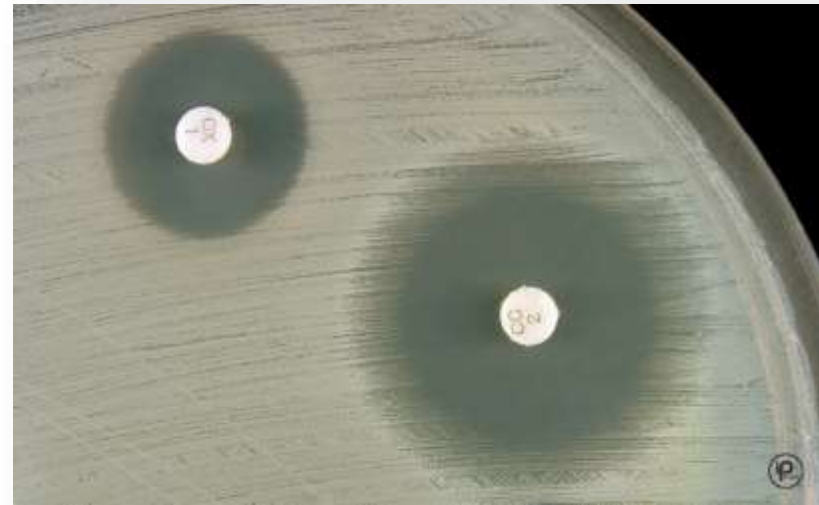
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# Treatment

A number of drugs will **lower mortality** from fowl cholera; however, **deaths may resume when treatment is discontinued**, showing that treatment does not eliminate *P. multocida* from a flock.

# Cont. ...

**Sensitivity testing** often aids in drug selection and is important because of the emergence of multi-resistant strains.



# Cont. ...

- **Sulfas** should be used with caution in breeders because of potential toxicity.
- **Penicillin** is often effective for **sulfa-resistant infections**.
- High levels of **tetracycline** antibiotics in the feed (0.04%), drinking water, or administered parenteral may be useful.
- **Norfloxacin** administered via drinking water is also effective against fowl cholera.
- In ducks, a combined injection of **streptomycin** and **dihydrostreptomycin** can be effective.

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# Prevention

## Eradication of infection requires:

1. Depopulation, cleaning and disinfection of buildings and equipment.
2. The premise should then be kept free of poultry for few weeks.
3. High level of biosecurity.
4. Rodents, wild birds, pets, and other animals that may be carriers of *P multocida* and must be excluded from poultry houses.

# Vaccination – Live Vaccines

- Attenuated live vaccines are available for administration:
  1. In drinking water to turkeys.
  2. By wing-web inoculation to chickens.
- Vaccination of chickens and turkeys with live *P. multocida* vaccines induces protection against **heterologous serotype challenge**.

# Cont. ...

**Three live vaccines available for use in the United States are:**

1. CU (Clemson University), a strain of low virulence
2. M-9, a mutant of CU with very low virulence
3. PM-1, a mutant of CU intermediate in virulence between CU and M-9.

# Cont. ...

- The use of live FC vaccines stimulates an effective immune response but has the disadvantage of **potentially resulting in mortality in the vaccinated birds.**
- If the mortality post vaccination becomes excessive, it can be reduced by the administration of an **antibiotic.**
  - This should be avoided, if possible, until at least **4 days post-vaccination** when there will be at least partial immunity induced by the vaccine.

# Vaccination – Killed Vaccines

- Commercially produced bacterins are available.
- Bacterins usually contain whole cells of serotypes 1, 3, and 4 emulsified in an oil adjuvant.