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# Pasteurellosis: Infectious Diseases Caused by *Pasteurella multocida* in Rabbits

## Basics

### OVERVIEW

- Pasteurellosis is a bacterial disease that can be a cause of nasal or sinus infections, ear or eye infections, pneumonia, or abscesses in bone, joints, or internal organs in rabbits.
- Often, pasteurella occurs with other bacteria, simultaneously causing infection.
- Transmission of *Pasteurella multocida* may be by direct contact, through the air or contaminated cages, litter, food bowls, etc. Most rabbits are infected at birth from mother rabbits.
- Pasteurella colonizes the nasal cavity and upper respiratory tract, but many rabbits do not show symptoms as long as the immune system is functioning normally.
- Most infections begin in the nose. Infection may then spread into the sinuses and bones of the face and/or spread via the eustachian tubes to the ears, via the nasolacrimal duct to the eye, via the trachea to the lower respiratory tract, and via the blood stream to joints, bones, and other organ systems.
- Not all infected rabbits become ill. Outcome of infection depends on both the ability of the immune system to clear infection and how potent the bacteria strain is. More potent strains of bacteria produce toxins. These toxins can destroy bone and cartilage in the rabbit's nose or can cause fever and lethargy. Damage to the nasal cavity can be permanent, impairing local defense mechanisms and allowing reinfection with pasteurella or other bacteria. These rabbits are often the "chronic snufflers."
- Several outcomes of infection are possible, including (1) elimination of infection, (2) chronic infection, where the bacteria live in the nasal cavity without causing symptoms, (3) development of symptoms that improve with antibiotic therapy and recur following discontinuation of therapy, or (4) long-standing, progressive disease.



## SIGNALMENT

No breed, age, or sex predilection

## SIGNS

- Usually begins with sneezing, discharge from the nose, staining of the front paws
- Discharge—often is clear initially, then becomes thick and white; it may be blood tinged or may contain blood
- Excessive tears or overflow of tears (known as epiphora), inflammation of the moist tissues of the eye (known as conjunctivitis)
- Head tilt or loss of balance may be seen with or following episodes of rhinitis/sinusitis due to extension of infection through the eustachian tube to the inner ear, where balance is controlled.
- Difficulty breathing with severe rhinitis (rabbits are obligate nasal breathers, meaning that they can only breathe through the nose, not the mouth), pneumonia, or large lung abscesses
- Lack of appetite, depression, pain from skeletal abscesses. This is often the only symptom in rabbits with lung or liver abscesses.
- Lameness, reluctance to move with foot or leg abscesses

## CAUSES

*Pasteurella multocida*

## RISK FACTORS

- Immunosuppression—Stress, concurrent disease, or taking oral steroid medications are the most important risk factors in developing bacterial rhinitis/sinusitis.
- Age—Young rabbits have an immature immune system.
- Poor husbandry—dirty, molding bedding; ammonia buildup from urine-soaked bedding, dusty hay or litter, cleaning agents

## TREATMENT

### APPROPRIATE HEALTH CARE

- Some rabbits may develop severe respiratory distress and require hospitalization with oxygen supplementation. Rabbits are obligate nasal breathers, meaning that they cannot breathe effectively through the mouth. If the nasal passages become blocked with mucus and pus, or become severely swollen, they cannot breathe. This can become life threatening.
- Keep nostrils clear of discharge.
- Humidification of environment often helps mobilize nasal discharge.
- Nebulization with normal saline may be useful to humidify airways; this is performed using a home nebulization unit or while in the hospital.
- Remove environmental allergens/irritants (dusty or moldy hay and litters; provide clean bedding and air space).

### ACTIVITY

No change unless in breathing distress

### DIET

Make certain that the rabbit continues to eat while being treated, to prevent potentially life-threatening gastrointestinal disease (GI stasis, bacterial overgrowth).

## MEDICATIONS

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered all-inclusive.

### Antibiotics

- Antibiotics are usually given for prolonged periods, from 2 to 6 weeks depending on the severity of infection. Relapse is common when treatment is stopped, especially if there has been permanent damage to the nasal passages. It is not unusual for some rabbits to require lifelong treatment, either continuously or off and on, as symptoms return.
- The number of antibiotics that are safe to use in rabbits is very limited as compared with those in pets such as dogs and cats. Oral administration of many antibiotics that would be effective against bacteria causing

respiratory infections will also kill bacteria that are necessary to keep the intestinal tract healthy and functioning. Examples of commonly used, safe, and effective oral antibiotics for pasteurilla include enrofloxacin, cirprofloxacin, marbofloxacin, trimethoprim-sulfa, chloramphenicol, and azithromycin. Penicillins can be given by injection only in severe or chronic cases.

### **Anti-Inflammatory Agents**

Nonsteroidal anti-inflammatory drugs (NSAIDs), such as meloxicam or carprofen, are sometimes used, especially in rabbits that are painful.

### **Antihistamines**

Efficacy is debated—hydroxyzine or diphenhydramine are occasionally used

## **FOLLOW-UP**

### **PATIENT MONITORING**

- Monitor for an increase in the severity of nasal discharge or difficulty breathing. Seek emergency veterinary attention if struggling to breathe. Keep the nostrils as clean as possible.
- Monitor for relapse when the course of treatment is finished.

### **PREVENTION/AVOIDANCE**

- Avoid stressful conditions, provide excellent diet and husbandry
- Avoid contact with infected rabbits

### **POSSIBLE COMPLICATIONS**

- Extension of infection into the brain, eyes, ears, or lungs
- Loss of appetite leading to intestinal tract disorders (GI stasis, bacterial overgrowth)
- Respiratory distress as a result of nasal obstruction

### **EXPECTED COURSE AND PROGNOSIS**

- Some rabbits will completely clear infections after a course of antibiotic therapy. Others may relapse as soon as antibiotics are discontinued, or may have off and on infections lifelong. Unfortunately, it cannot be predicted which course your rabbit will take when symptoms are seen.
- Long-term (chronic) infections are frustrating to both owners and veterinarians; lifelong therapy may be required. Some infections will become resistant to all antibiotics that are safe to use in rabbits and cannot be successfully treated.

## **KEY POINTS**

- Pasteurellosis can cause respiratory, joint, and organ-system infections, with a wide range of severity of disease. Some bacteria produce toxins that can cause permanent damage to the nasal cavity and sinuses, leading to recurring symptoms.
- There is no way to accurately predict if a rabbit will completely clear the infection with antibiotic treatment, or if the infection will return. Some rabbits require medications to treat infection lifelong.

# Notes

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