

## EAR INFECTIONS

(Adapted from Veterinary Information Network [www.vin.com](http://www.vin.com))



As demonstrated by the above illustration, the dog's ear canal has a vertical and a horizontal component. This structure predisposes dogs to ear infections as debris must work its way upward rather than straight out.

Ear disease usually stems from over-production of wax, which occurs in response to irritation. Allergic skin disease affecting the ears is one possible cause, especially in recurring cases; other causes of ear infections include ear mites; foreign

bodies such as grass awns or foxtails; or hair growth deep in the canal, which is especially common in poodles and schnauzers. The moisture of the wax promotes bacterial growth and infection. Soon wax in the ears is joined by pus.

It isn't long before the pet is seen scratching at his ears, shaking his head or holding one ear slightly dropped. Discharge and odor may be noticeable to people.

### Complications of Ear Infection

If the infection reaches the middle ear, affected animals may have a head tilt, a lack of balance, and unusual back-and-forth eye movements called nystagmus. These symptoms are called vestibular signs and represent a complication of middle ear infection. Middle ear infections can also cause paralysis of the facial nerve, leading to a slack-jawed appearance on that side of the face.

### Aural Hematoma

When a dog with uncomfortable ears shakes and scratches vigorously, a blood vessel in the earflap may rupture. This leads to bleeding into the tissues of the pinna (see above illustration). The usual recommendation is to have the blood clots removed and to bandage and clean the ear under anesthesia. If the hematoma is not so big as to obstruct the ear canal (thus preventing medication from getting where it is supposed to go), you can forego surgery, but without surgery the ear may scar down into an abnormal appearance.

### Treating Ear Infections

#### Step One

Most ear infections are cleared up simply with professional cleaning followed by medication at home. If there is only mild debris in the ear canals, simple disinfection and washing of the ear is adequate; however, in many cases, a full ear flush is needed to even examine the eardrum. For patient comfort, we recommend a general anaesthetic for this procedure as the ears are sore and the instruments can be damaging if the pet jumps at the wrong time. A sample of ear discharge is commonly examined under the microscope to assist in selecting medications for home use. After a couple of weeks of home treatment, the ear canals are rechecked to be sure the infection is gone. In most cases this completes treatment but for stubborn cases, we must proceed to the next step.

#### Step Two

Some dogs have chronic ear problems in which the infection is not controlled by general medication or returns when general medication is discontinued. In these cases, the ear discharge should be cultured so that the precise organism can be pinpointed and treated specifically. Regular treatment at home with disinfecting ear washes should become part of the pet's grooming routine.

Further testing may be in order to determine why the infection continues to recur. Allergy is the most common reason for recurrent ear problems but hormone imbalances can also be underlying causes.

#### Step Three

Some ear infections simply cannot be controlled with the above steps. These cases have transcended medical management and must proceed to surgical management.

Depending on the severity of the problem, the vertical canal may need to be opened surgically. This enables debris to be removed more effectively. This is done to prevent severe scarring after prolonged specific medical therapy has been ineffective.

If the canal becomes so scarred that it is practically closed, ablation may be the final option. In this surgical procedure, the entire ear canal is removed and healthy tissue is allowed to grow in. These procedures are last resorts after severe infection has made effective medical treatment impossible. A specialist is called in for these cases, and although surgery is expensive, dogs with chronic severe otitis usually require no further ear treatment for the rest of their lives.

### Some information on Pseudomonas infection

Gram negative rods stain pink with Gram staining. Gram negative rods in general tend to be more resistant to antibiotics than Gram positive (blue-staining) bacteria. *Pseudomonas* is particularly resistant and able to become still more resistant if treatment is not decisively effective from the beginning. Gram negative ear infections are best cultured promptly so as to identify *Pseudomonas* and take appropriate steps as soon as possible.

*Pseudomonas aeruginosa* is a specific species of bacteria that is resistant to almost every possible antibiotic. It is common for ear infections to recur and over time, many antibiotics are used. The unfortunate tendency is for most bacteria to be killed off, leaving infection with the very resistant and practically immortal - not to mention especially smelly and pus-causing - *Pseudomonas*.

If one is lucky, a culture of the ear discharge will reveal that the *Pseudomonas* is still sensitive to oral quinolone antibiotics such as enrofloxacin or orbifloxacin. It should be noted that especially high doses of this type of antibiotic are needed to treat *Pseudomonas* in the ear and that inadequate dosing will just make *Pseudomonas* even more resistant. In other words, *Pseudomonas* must be treated definitively from the moment it is diagnosed; once it becomes resistant to oral therapy, treatment becomes vastly more difficult.

Oral therapy is generally combined with some kind of topical treatment. Fortunately there are several concoctions that should be useful though some your vet must mix personally:



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### Silvadene/silver sulfadiazine

This product is manufactured as a wound cream and is especially helpful in hastening the healing of damaged external tissues. It also has activity against several bacteria including *Pseudomonas*. The cream can be prepared in water for an easier ear administration. This is an especially helpful product if the *Pseudomonas* is resistant to topical antibiotics.

### Tris-EDTA

EDTA is a binder of metals that are important to the bacterial cell wall. Tris is used to buffer the EDTA to a pH that is not irritating to the ear and to maximize the anti-bacterial effect. Using Tris-EDTA gives extra power to the topical antibiotics used concurrently.

### Injectable Medications

It would be unusual for a *Pseudomonas* species to be resistant to absolutely everything. While there may not be an oral treatment available, sometimes an owner may be taught to give injectable treatments. These are often expensive, however. These same medications can also be mixed up for topical use; many are already available as commercially prepared solutions.

Chronic ear infections, as mentioned, typically have an underlying cause (usually allergy). It is important to address this problem in addition to the infection itself so as to minimize on-going ear inflammation.

Ear infections can be especially frustrating as they have the ability to draw out for months, even years, even with the best of treatment. It is important to have a logical approach, to know what sort of infection is in the ear, to do proper home care regularly, **and to have regular recheck appointments**. If a patient has a history of particularly stubborn ear infections or numerous recurrences, treatment focus shifts to prevention, such as weekly ear disinfection, once the acute infection is eliminated.