

Eliminating Otitis in 4 Steps with 6 Products

Four Steps

Find the underlying disease.

Most chronic cases of otitis are caused by the changes in the micro environment that normally protects the ear canal from opportunistic yeast and bacterial overgrowth. When the tissue becomes inflamed as with allergy or the glands and normal defense mechanisms are altered as with endocrine diseases, the bacteria and yeast rapidly populate the canal leading to secondary infections. Foreign bodies, neoplasia, and polyps can act as a nidus for recurrent infections.

Conformational changes are often blamed for causing the recurrent otitis. In actuality, abnormal ear conformation is rare and typically not the cause of secondary infections.

Use High concentration Topical products

Systemic antimicrobials do not achieve high enough concentrations in the ear tissue to kill pseudomonas. Yeast and bacteria (with lower MICs) may be effectively treated with systemic treatments but topicals usually work fine.

Use High volumes and Frequent Applications of therapeutics

One of the most common causes of treatment failures is the use of too small volumes of cleaners or treatment solutions. Enough topical solution must be used to coat the entire ear canal thus saturating the organisms with the antimicrobial.

Dropper bottles provide an easy method that allows the owner to treat the ear more quickly yet ensuring adequate volume has been used. Many products are dispensed in bottles that conceal the applicator making it impossible to visualize the solution during the treatment procedure. This results in too little medicine being instilled and thus treatment failures.

Treating the active otitis requires instilling enough of the therapeutic every 12 hours until the infection resolves.

Don't Just Stop but Taper Frequency

One of the most common problems is stopping the medications all at once when the infection has resolved. Because otitis is caused by underlying/primary diseases (allergies, endocrinopathies, etc.) continuing ear treatments to prevent infection recurrence is crucial. Often the frequency of otic cleaning and/or treatment can be reduced to every 2-7 days (after weekly bath works well). When the underlying disease has been corrected, the ear maintenance treatments can be reduced even further.

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6 Products (Hnilica's list)

1. Alcohol based ear cleaner (Vet Solutions Ear Cleaner)

Cases selection:	normal ears of swimming dogs
Benefits:	Clean, dry, and disinfect the ear canal (like swimmer's ear therapies)
Adverse effects:	Pain if broken skin, ototoxic if ruptured ear drum

In dogs that swim often, an alcohol based ear cleaner is useful to clean, disinfect, and dry the ear after swimming. Alcohol ear cleaners are usually inexpensive.

Alcohol will cause PAIN if used in ears that have lesions or active inflammation. Additionally, if the tympanic membrane is ruptured, alcohol ear cleaners should not be used.

2. Epiotic (Virbac)

Case selection:	Any dirty ear
Benefits:	One of the best yet mild ear cleaners for wax or pus
Adverse effects:	none

Any dirty ear that needs cleaning should be flushed by filling the entire ear canal; massaging the canal and letting the patient shake. No swabs should be used as these are like "Brilo pads on a stick" and irritate the canal. Ear cleaning solutions can be irritating if used more often than every other day. Epiotic has mild antibacterial and anti yeast effects.

3. Otomax[®] (Schering)

Case selection:	98% of infectious otitis cases can be successfully treated with Otomax [®] bid
Benefits:	Thin ointment that helps dissolve wax with a moderately potent steroid, new generation antifungal, and gentamycin.
Adverse effects:	Few: ototoxic in less than 1% of cases.

Otomax[®] is thin enough to penetrate the deep ear canal in most otitis cases. It has multivalent antimicrobial effect (yeast and bacteria) with a moderately potent steroid to help normalize the inflammation in the ear canal. Most otitis cases will respond to Otomax[®] therapy with in 10-14 days. Otomax[®] can also be used for chronic/recurrent cases to prevent the infections from returning (instilled every 2-7 days as needed to prevent infection and control inflammation). Stopping otic

therapy completely is a common mistake in dogs with recurrent otitis associated with an underlying/primary disease.

Dropper bottles should be used to ensure sufficient volume is used to coat the entire ear canal (1/3 dropper in small dogs and 1/2 dropper in big dogs). BID dosing is best.

4. LA Baytril 100 Injectable (Bayer)

Case selection: *Pseudomonas* Otitis

Benefits: High concentrations of enrofloxacin can be achieved with less volume

Adverse effects: contains benzyl and butyl alcohol

Use the injectable enrofloxacin to make 1% - 2% ear treatment solutions (10-20mg/ml final concentration)

5. T8 Solution (DVM Pharmaceuticals)

Case selection: *Pseudomonas* Otitis

Benefits: Contains surfactants to clean the ear and benzyl alcohol to help kill *pseudomonas*

Adverse effects: none documented even when used with ruptured ear drums

The emerging best in class therapy for chronic and recurrent otitis caused by secondary *Pseudomonas* infections relies on the use of tris-EDTA compounded treatments. Tris-EDTA alters the bacteria's normal defensive mechanisms and has a synergistic effect when used in combination with topical antibiotics. With the recent introduction of new otic preparations; the use of tris-EDTA has become more common. Anecdotal reports suggest good efficacy against *Pseudomonas* otitis when tris-EDTA is combined with high concentrations of enrofloxacin even when used without systemic antibiotics.

T8 Solution[®] contains surfactants (nonoxynol 12), tris-EDTA, benzyl alcohol and buffers to make a final solution with a pH of 8.5. The surfactant provides a mild cleaning action that helps remove the otic exudate without irritating the otic canal tissue. The tris-EDTA in a buffered solution makes it possible to compound enrofloxacin into the solution without the inactivation of the fluoroquinolone caused by the acidic pH in acid otic cleaners. Benzyl alcohol is an FDA approved aromatic alcohol. Studies evaluating the ototoxicity of benzyl alcohol are lacking; however, benzyl alcohol is a bacteriostatic preservative in many pharmaceuticals, ophthalmic and otic solutions (including Cipro HC Otic and Baytril Otic), cough syrup, bacteriostatic water for injection, and other intravenously medications. Additionally benzyl alcohol has been shown to be an effective topical local anesthetic. A recent study demonstrated that a tris EDTA solution containing benzyl alcohol significantly reduced the bacterial counts of *Staphylococcus intermedius* and *Pseudomonas aeruginosa* where as a tris EDTA solution without benzyl alcohol had no

effect on *Staphylococcus intermedius* and *Pseudomonas aeruginosa* counts. The authors concluded that the addition of benzyl alcohol was necessary to significantly reduced *Staphylococcus intermedius* and *Pseudomonas aeruginosa* counts.

6. Steroids (oral or Mometamax^R)

Case selection: Severely Swollen, stenotic, and painful ears

Benefits: Reduce the inflammation, pain, and swelling:

also allow the topical medications to penetrate the deep ear canal better

Adverse effects: Iatrogenic Cushing's disease

Potent steroid therapy greatly improves the clinical symptoms of severe otitis. The swelling and pain commonly seen can be greatly reduced with steroid therapy making it easier for the owner to medicate the ear canal. Additionally, the ear canals usually open significantly allowing the topical treatments to penetrate into the deep canal better.

Several treatment options are available.

Oral steroids provide an effective inside-out treatment without complicating the topical treatment protocols. High antiinflammatory doses should be used for 7-14 days.

Alternatively, potent topical steroids may be used (Synotic, Mometamax). These products contain extremely potent steroids that penetrate the ear tissue causing a local effect as well as deep tissue and systemic steroidal effects. These products should be used and assumed to be absorbed systemically. Therefore, short durations of bid dosing should be administered in severe otitis cases when the clinician would be willing to use systemic steroid therapy. Using topical steroids complicates the topical antimicrobial treatment. Compounding (mixing) too many ingredients in bottles or in the ear canal creates interactions that can decrease the efficacy of the treatments.