

## VETERINARY VACCINE- GLOBAL HEALTHCARE RESEARCH AND SURVEY WITH KEY PARTICIPANTS

The global Veterinary Vaccine market is expected to exhibit more vigorous growth and become one of the most remunerative industries by 2024. Factors such as rapidly growing Veterinary Vaccine demand, product awareness, contemporary market trends, changing consumption tendencies, raw material affluence, and rising disposable incomes are boosting global Veterinary Vaccine market growth.



## ELI GLOBAL ACQUIRES VETERINARY DERM COMPANY STRATFORD PHARMACEUTICALS

August 28, 2018

Stratford, which currently provides a wide arrangement of dermatology products will continue to operate independently from its Oldsmar, Fla., corporate headquarters. Greg Lindberg is chairman and CEO of Eli. "Partnering with Eli Global was a natural fit as it allows Stratford to keep our corporate identity while continuing to provide excellent products and services to our large base of veterinary hospitals in the U.S. and abroad," said Nugent.

## ORANGE, CALIF., RANKED TOP HEARTWORM CITY FOR SEPTEMBER

September 13, 2019

Orange, Calif., is the number one city for heartworms in September, the Companion Animal Parasite Council (CAPC) reports. It takes just one heartworm-infected dog in an area to become a reservoir of infection, increasing the number of infected mosquitoes and ultimately spreading the heartworm parasite to unprotected dogs and cats. This is why CAPC recommends monthly heartworm protection and annual testing for both heartworm antigens and microfilariae — regardless of where pets live or travel.

## CANINE PARVOVIRUS TREATMENT MAY BE IN THE WORKS

August 19, 2019

Veterinarians may soon have access to an antibody effective in the treatment of canine parvovirus (CPV). KindredBio has released positive results from a pilot efficacy study of KIND-030, a chimeric, high-affinity monoclonal antibody targeting the virus. The study looked at 12 dogs, of which four were treated prophylactically and two were treated after establishment of the infection. Treated dogs in both settings survived, compared to none in the applicable placebo group. "This is a unique antibody program, which targets a significant unmet medical need that results in very high mortality," says KindredBio CEO Richard Chin.



# CANINE OTITIS: TREATMENT ADVICE FROM THE EAR TIP TO THE TYMPANIC MEMBRANE

## HOW TO ACHIEVE AN OPTIMAL OUTCOME IN VETERINARY PATIENTS WITH EAR INFECTIONS OR ALLERGIC CONDITIONS.

Sep 28, 2015 (By Craig E. Griffin, DVM, DACVD VETERINARY MEDICINE)

### TRY COMBINATION THERAPY FOR RESISTANT INFECTIONS

Combinations of medications may be helpful in eliminating resistant bacteria.

#### Three different topical agents

##### Antiseptics

##### Synergistic Agents

##### Topical Antibiotics

may be used to kill the resistant bacteria.

The ear can be cleaned with an antiseptic, and then the topical treatment may contain both a synergist (such as Tris-EDTA or miconazole) along with an antibiotic.

**Significance:** Methods employed for preventing and eliminating biofilms are limited in their efficacy on mature biofilms. Despite this, a number of antibiofilm formulations and technologies incorporating ethylenediaminetetraacetic acid (EDTA) have demonstrated efficacy on in vitro biofilms. The aim of this article is to critically review EDTA, in particular tetrasodium EDTA (tEDTA), as a potential antimicrobial and antibiofilm agent, in its own right, for use in skin and wound care. EDTA's synergism with other antimicrobials and surfactants will also be discussed.

**Recent Advances:** The use of EDTA as a potentiating and sensitizing agent is not a new concept. However, currently the application of EDTA, specifically tEDTA as a stand-alone antimicrobial and antibiofilm agent, and its synergistic combination with other antimicrobials to make a "multi-

pronged" approach to biofilm control is being explored.

**Critical Issues:** As pathogenic biofilms in the wound increase infection risk, tEDTA could be considered as a potential "stand-alone" antimicrobial/antibiofilm agent or in combination with other antimicrobials, for use in both the prevention and treatment of biofilms found within abiotic (the wound dressing) and biotic (wound bed) environments. The ability of EDTA to chelate and potentiate the cell walls of bacteria and destabilize biofilms by sequestering calcium, magnesium, zinc, and iron makes it a suitable agent for use in the management of biofilms.

**Future Direction:** tEDTA's excellent inherent antimicrobial and antibiofilm activity and proven synergistic and permeating ability results in a very beneficial agent, which could be used for the development of future antibiofilm technologies.

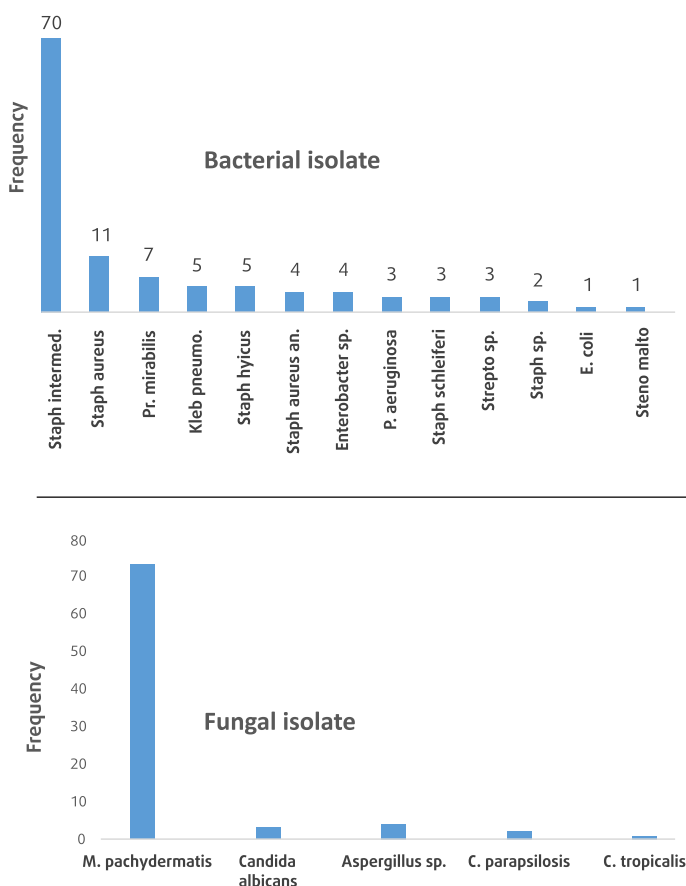


## IN BILATERAL CANINE OTITIS EXTERNA, EACH EAR SHOULD BE CULTURED SEPARATELY AND CONSIDERED AS SEPARATE UNITS

(Ref: CVJ / VOL 49 / AUGUST 2008)

Otitis externa (OE) is the most common disease of the ear canal in dogs and it has a multifactorial etiology. Microorganisms most frequently isolated from canine OE are *Staphylococcus intermedius* and *Malassezia pachydermatis* (1), although many other agents have been described. Despite advances in therapeutic approaches, canine OE remains, in many cases, refractory to treatment because of the complexity of the etiological agents and the emergence of resistance to antibiotics among the microorganisms involved.

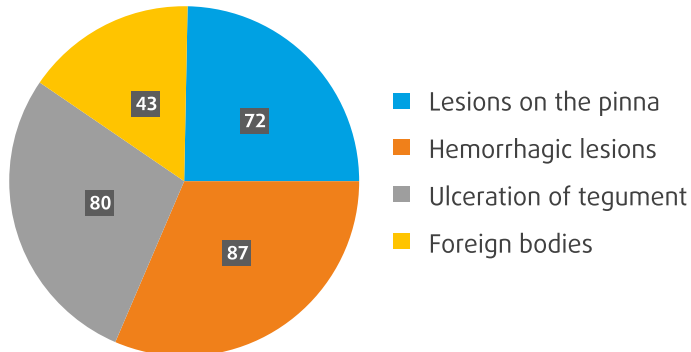
In this study, frequency with which agents were isolated in bilateral canine otitis externa were studied (Fig1, Fig 2)



## Most Frequent Clinical Signs

Sign	Occurrence
Lesions on the pinna	72
Hemorrhagic lesions	87
Ulceration of tegument	80
Foreign bodies	43

## Most Frequent Clinical Signs



The agents most frequently isolated were *S. intermedius* and *M. pachydermatis*. Although, most frequently, the same species of microorganisms were isolated from both ears, some differences were observed in the association pattern between the right and left ears in 34 of the 50 animals (68%).

These results are very important in selecting the therapeutic approach and suggest that, in bilateral canine OE, each ear should be cultured separately and considered as a unit. This procedure should help to resolve the refractory cases of chronic canine OE.

There has been increasing interest in *S. intermedius* in dogs. It has been demonstrated at both the molecular and immunological levels that virulent strains of *S. intermedius* possess a substantial enterotoxigenic potential and produce toxins with super antigenic properties. These findings become important when considering the evident zoonotic potential of this species. *Malassezia pachydermatis* is a common component of the microbiota of the domestic carnivore's skin.

During the past decade, *Malassezia* species have also emerged as increasingly important pathogens in neonates in human intensive care nurseries.

Antimicrobial resistance of *Staph. intermedius* (n = 70) isolated in bilateral canine otitis externa

Antimicrobial agent	Resistant (%)
Penicillin G	34.3
Tetracycline	28.6
Ampicillin	28.6
Erythromycin	27.1
Clindamycin	15.7
Trimethoprim/sulfamethoxazol	5.71
Cloramphenicol	4.29

This study emphasizes the need for bacterial culture, species identification, and susceptibility testing in order to choose appropriate antimicrobial agents and to improve the clinical therapeutic approach for canine OE.

## OTITIS EXTERNA – A MULTIFACTORIAL PROBLEM

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Otitis externa is a very common problem seen by primary care clinicians on a daily basis. It is defined as an inflammatory process of the external auditory canal that can be triggered by many causes or factors. It is important for clinicians to identify all of the factors contributing to the ear disease in order to successfully manage otitis externa.

### A recently adapted classification scheme divides the causes as:

- Predisposing
- Primary
- Perpetuating

### Predisposing causes include:

#### • Conformation of the ear canal:

- Breeds with pendulous ears (Cocker, Springer spaniels) and erect ears (German shepherds) have more ceruminous glands than breeds less prone to otitis.
- Stenotic ear canals: Shar Pei, Chow Chow and English bulldog.
- Hair in the external ear canal

#### • Maceration of the ear canal from excessive moisture:

- Swimmer's ear from bathing or swimming
- High humidity climate

#### • Iatrogenic irritation:

- Topical medications and ear cleaners can result in chemical irritation. Excessive cleaning can cause ear canal maceration.
- Trauma or irritation from inappropriate use of cotton swabs or cotton tips

### Primary causes: Can produce otitis externa alone without predisposing or perpetuating factors.

#### • Parasites:

- *Otodectes cynotis*, *Demodex* sp. and ticks

#### • Foreign bodies:

Usually unilateral. Often the inciting foreign body is never identified as it becomes coated in cerumen

#### • Failure of epithelial migration:

- A defect in epithelial migration may be responsible for the accumulation of wax and keratin in the ear canal leading to formation of soft wax plugs or hard concretions known as ceruminoliths
- Ceruminoliths can cause discomfort leading to head shaking and rubbing, hearing deficits and secondary yeast and bacterial ear infections
- Ceruminoliths attached to tympanum may be released into the middle ear leading to otitis media

#### • Hypersensitivities:

- Atopic dermatitis:
  - Otitis externa is seen in 50-80% of atopic dogs
  - Atopy is the most common cause of persistent or recurrent otitis externa in dogs
- Food allergies
  - Otitis externa is seen in up to 88% of food allergic dogs

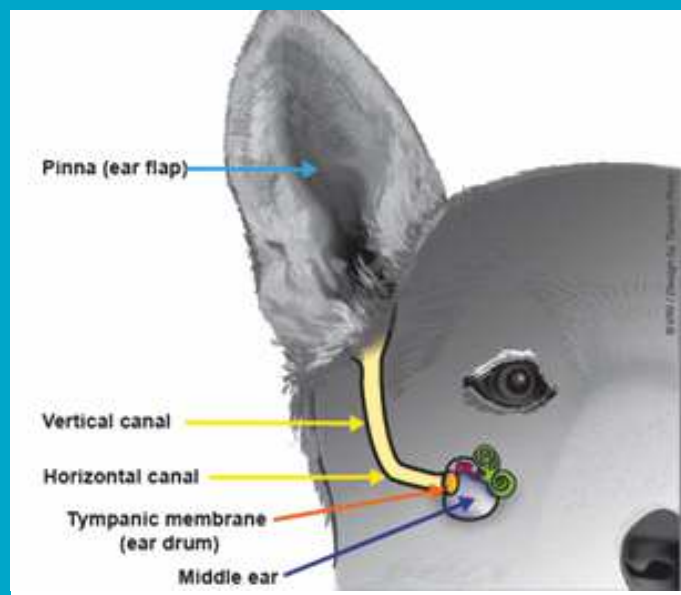


## EAR INFECTIONS (OTITIS) IN DOGS

Wendy Brooks, DVM, DABVP

Date Published: 01/01/2001

Date Reviewed/Revised: 08/01/2018



Dogs seem to get ear infections with a surprising frequency and some dogs have to deal with ear infections nearly constantly. As compared to human beings, their best friends need to face ear infections frequently because:

### 1. The shape of the ear canal

### 2. The common frequency of conditions leading to excess ear wax

If ear wax cannot get out, it accumulates. Accumulation of ear wax, skin oil, and other debris feed the bacteria and fungi in the normal ear canal leading them to proliferate and sets the stage for ear infection. The narrowed ear opening further hampers ear drainage, irritation from water in the ear canal after a bath, or actual disease causing over-production of ear wax.

The moisture of the wax promotes bacterial growth, yeast proliferation, and perhaps even pus development.



- Contact hypersensitivity (examples neomycin or propylene glycol)
- Whenever otitis externa fails to respond or worsens after treatment has been initiated, consider the possibility of a contact allergic or irritant dermatitis

### • Keratinization disorders and Endocrine diseases:

- Breeds like cocker spaniels are prone to idiopathic seborrhea
- Endocrinopathies such as hypothyroidism, male-feminizing syndrome, sertoli cell tumor and some ovarian imbalances can result in chronic ceruminous otitis externa
- Sebaceous adenitis (e.g. Samoyeds and standard poodles) - scaly ears is common with this disease

### • Immune mediated diseases:

- Pemphigus foliaceus, pemphigus erythematous, discoid lupus erythematosus, idiopathic vasculitis (dogs), erythema multiform, toxic epidermal necrolysis
- These diseases typically affect the pinnae but may extent to the ear canals

### • Juvenile cellulitis:

- Age of onset is 3 weeks to 4 months. Animals present with fever, depression, lymphadenopathy and typically lesions on the muzzle, chin and pinnae. Lesion on pinnae often extent to the ear canals

### • Inflammatory polyps in cats:

- It can originate from the lining of the tympanic cavity, auditory canal or nasopharynx
- Polyps originating from the tympanic cavity often extent to the external ear canal and cause otitis externa

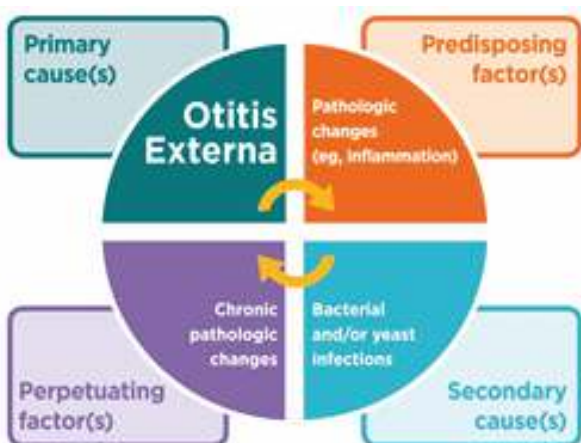
### • Neoplasia:

- Dogs - Ceruminous gland adenomas and adenocarcinomas, papilloma, basal cell carcinoma, squamous cell carcinoma
- Cats - Ceruminous gland adenomas and adenocarcinomas, papilloma, basal cell carcinoma, squamous cell carcinoma and sebaceous gland adenomas

### Perpetuating factors:

### • These factors are capable of perpetuating otitis even if the primary factor has been removed

- Bacteria and yeast (*Malassezia* spp)
  - More often complicating factors of allergic otitis. Rarely the primary cause
- Treatment errors
  - Overtreatment or undertreatment
  - Inappropriate treatment
  - The wrong medication is used and /or the duration of treatment is inadequate leading to persistent infection or overgrowth with normal microflora
- Chronic pathologic changes
  - Hyperplasia or calcification of ear canal



## Complications Of Ear Infection

### Aural Hematoma:

When a dog with uncomfortable ears shakes and scratches vigorously, a blood vessel in the earflap may rupture leading to bleeding into the tissues of the pinna (ear flap).

### Proliferative Ear Canal Change and Middle Ear Infection:

A routine ear infection is uncomfortable enough but if the infection persists, it can become an even bigger problem. The infection can lead to proliferation and scarring in the canal which makes the infection especially difficult to clear up. The ear canal may mineralize and the middle ear may come to be involved, leading to nerve damage.

Affected animals may have

Head tilt

Lack of balance

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.

Severe cases may require surgical intervention to remove the vertical portion of the ear canal (lateral ear resection) or even remove and seal the ear canal (ear canal ablation). It is important to control ear infections before they reach this stage if at all possible.

## Treatment

### Level One: The Simple Ear Infections

Most ear infections are cleared up simply with professional cleaning followed by medication at home. If only mild debris is present 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 sedation 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 so as 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.

### Level Two: On-Going Ear Infections

Some dogs have chronic ear problems, 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.

### Level Three: The End-Stage Ear Infections

Some ear infections simply cannot be controlled with the above steps. These cases have gone beyond medical management and must proceed to surgical management. What this entails will depend on the state of the ear canal. Chronic inflammation has led to proliferation of ear tissue.

Ear infections are common and can be challenging. Fortunately, most cases are simple and easily cleared up. Be sure to recheck the ears as your veterinarian recommends as premature discontinuance of treatment can lead to a continuing infection.

## Otitis Externa

Otitis externa is in the top 10 diagnoses for cats and dogs, according to the 2016 State of Pet Health Report. In 2015, 13 percent of dogs and 7 percent of cats were diagnosed with the condition.

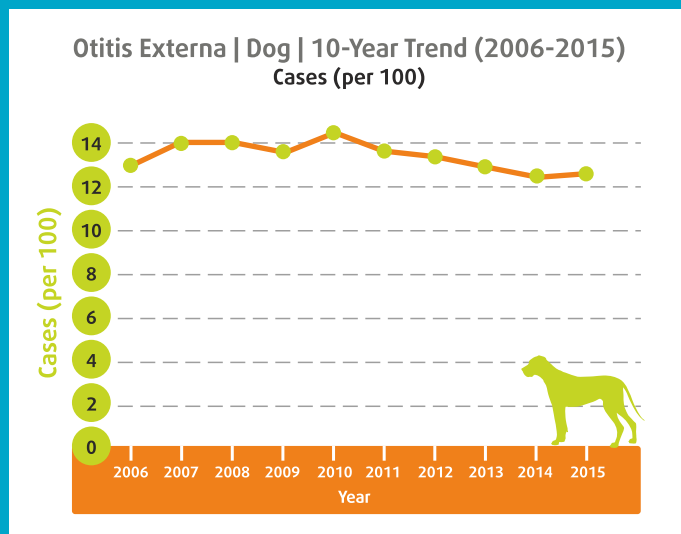


Chart courtesy of the Banfield Pet Hospital 2016 State of Pet Health report

The prevalence of otitis externa in dogs peaked in 2010 at 14 percent. Since then the prevalence has decreased to 13 percent.

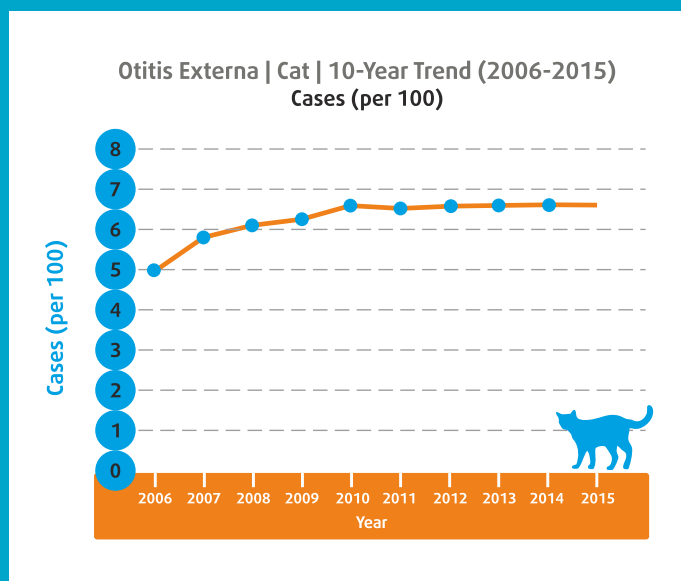


Chart courtesy of the Banfield Pet Hospital 2016 State of Pet Health report

Between 2006 and 2010, the number of diagnosed otitis externa cases in cats rose 30 percent, and that prevalence has remained steady since 2010.

# DIAGNOSTIC APPROACH TO OTITIS IN DOGS

(Today’s Veterinary Practice September/October 2011)

## Sample Collection & Examination: Pinna

Many primary triggers for otitis first present with signs on the pinna. A careful inspection can identify primary lesions and secondary lesions:

### Primary & Secondary Lesions of the Pinna

Primary Lesions	Secondary Lesions
Comedones Erythema Papules Pustules Ulcers	Crusts Excoriations Hyperpigmentation Lichenification Scales

Secondary lesions tend to be less useful diagnostically. A minimum data base for the pinna should include:

- Cytology (impression smears and tape preparations)
- Superficial and deep skin scrapings
- Trichograms
- Bacterial and fungal culture
- Fine-needle aspirates
- Biopsy.

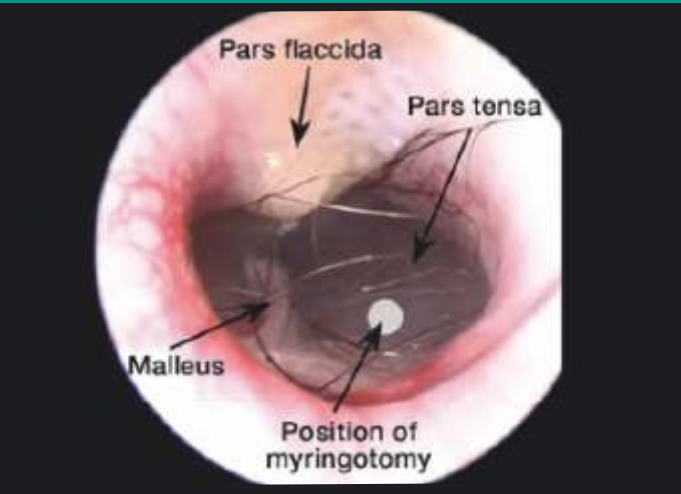
The type of lesion best suited to each of these diagnostic techniques is as per

Primary Lesion	Diagnostic Tests	Most Common Results
Comedone	Biopsy Deep skin scrapes Fungal culture Trichogram	<i>Demodex canis</i> <i>Dermatophytosis</i> Hyperadrenocorticism Hypothyroidism
Crust & Scale	Cytology Deep skin scrapes Fungal culture	<i>Demodex cornei</i> <i>Dermatophytosis</i> <i>Malassezia pachydermatis</i> <i>Sarcoptes scabiei</i>
Nodules or Plaque	Biopsy Fine-needle aspirate Tissue culture	Hyperplastic disease Infectious nodular disease Neoplasia
Plapule	Bacterial culture Cytology Deep skin scrapes	Cheyletiella species Ectoparasites (ie, <i>Sarcoptes scabiei</i> ) <i>Notoedres cati</i> <i>Otodectes cynotis</i>
Pustule	Bacterial culture Biopsy Cytology	Infection (ie, <i>Staphylococcus pseudointermedius</i> ) Sterile pustular disease (ie, pemphigus foliaceus)
Ulcer	Biopsy Impression smear	Contact allergy/irritant Immune-mediated disease (ie, vasculitis)

**Sample Collection & Examination: Wall Of The Canal:**  
When lesions are present on the ear canal wall, samples should be taken directly from those lesions. Impression smears, fine-needle aspirates, and biopsies can be taken from this site.

- Impression smears can be taken from ulcerative channel of a video otoscope (needles are supplied by the video otoscope manufacturer) or using a long spinal needle inserted alongside a video or handheld otoscope.
- Biopsies can be accomplished by using a laser or may be removed by traction from the canal wall using a pair of long crocodile forceps.

## Sample Collection & Examination: Middle Ear Tympanic Membrane:



Normal tympanic membrane and canal



A bulging tympanic membrane in a case of secretory otitis media

The normal tympanic membrane should be thin, pale grey and translucent. Abnormalities are associated with bulging due to presence of fluid in the middle ear.

**Myringotomy:**  
When the tympanic membrane is abnormal but intact, a myringotomy under general anesthesia should be performed. This useful technique should only be performed by an experienced clinician and is difficult to accomplish safely without the use of a video otoscope.

### Guarded Swab:

If the tympanic membrane is ruptured, a guarded swab can be used to collect samples for cytology and culture



Otic Technique to take guarded swab

### Examination :

A catheter can be introduced into the middle ear through a ruptured tympanic membrane or via myringotomy and used to palpate the wall of the middle ear. The catheter can be bounced off the walls of the tympanic bulla to assess whether the bulla is air filled (if the catheter bounces off solid bone) or contains soft springy granulation tissue.

### Sample Collection & Evaluation: Discharge

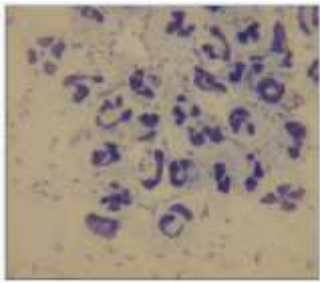
**Cytology:** Cytologic examination of discharge from ears should be a routine part of every ear examination. Both ears should be sampled even if only 1 ear is affected in order to identify any initial asymptomatic ear infection.

### Sample Collection & Evaluation: Discharge

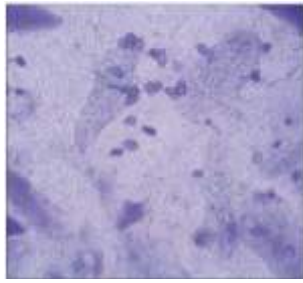
**CYTOLOGY:** Cytologic examination of discharge from ears should be a routine part of every ear examination. Both ears should be sampled even if only 1 ear is affected in order to identify any initial asymptomatic ear infection.

Microscopic Finding	Description	Diagnostic Finding
CYTOLOGY		
Bacteria	Cocci	Enterococcus Staphylococcus Streptococcus
	Rods	Coliforms Proteus Pseudomonas
Inflammatory Cells	Degenerate neutrophils + proteinaceous debris	Acute disease (often accompanied by debris nucleated epithelial cells and bacteria)
	Degenerate neutrophils & macrophages + proteinaceous debris	Chronic disease (often accompanied by nucleated epithelial cells and bacteria)
Keratinocytes	Large anucleate epithelial cells (may be flat or rolled, with or without stain)	Normal finding May be found in acute disease
	Large anucleate or nucleated epithelial cells + debris	Nonspecific finding Often present in chronic disease, especially allergies
	Rounded nucleate cells with nondegenerate neutrophils	Autoimmune skin disease, especially pemphigus foliaceus
Yeast	Peanut shaped	<i>Malassezia pachydermatis</i>
ECTOPARASITES		
Mites	Long cigar-shaped mite; adult has 8 legs	<i>Demodex canis</i>
	Large oval-shaped mite; adult has 8 legs	<i>Otodectes cynotis</i>





Ear cytology from a case of *Pseudomonas* otitis showing neutrophilic infiltrate with rods



Ear cytology from an ear infected with *Malassezia* species

### Ectoparasites:

Collecting samples for ectoparasite identification, such as otodectes and demodex mites, can also be performed. Wax can be collected by wiping a cotton wool swab along the wall of the canal.

### Imaging:

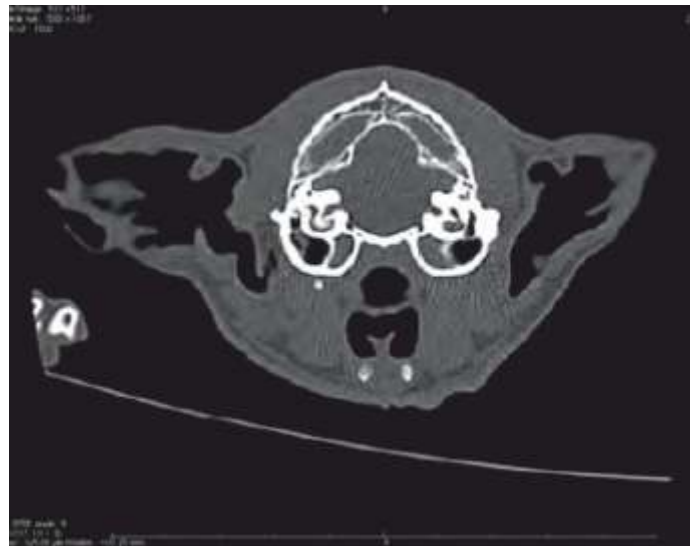
#### RADIOGRAPHY:

Radiography is performed using 3 most common views:

1. Dorsoventral
2. Rostrocaudal
3. Lateral oblique

But radiography is a comparatively insensitive technique.

Both CT & MRI give excellent visualisation of the middle ear and are highly preferable.



CT image of cat's ears. The normal appearance of the black air-filled tympanic bulla is partially lost due to the pale soft-tissue densities within the bulla. These changes are consistent with the presence of granulation tissue due to chronic otitis media

CT image of cat's ears. The normal appearance of the black air-filled tympanic bulla is partially lost due to the pale soft-tissue densities within the bulla. These changes are consistent with the presence of granulation tissue due to chronic otitis media.



**Presentation:**  
1x7 Tablets



**Presentation:**  
1x10 Tablets



**Presentation:** 15g

#### Indication:

Dermatophytosis in cats and dogs  
Malassezia Dermatitis in dogs  
In canine otitis externa

#### Dosage:

10-30 mg/kg BW  
For 10Kg dog- 1tablet  
For cats: 1/2 tablet



#### Indication:

Aqueous Ear Cleansing Solution  
To potentiate the effect of antibiotics  
(can be used before administration of Antibiotic ear drops)