“Management of Chronic Pseudomonas Ear Infections”

With Dr Peter Hill  
Specialist in Veterinary Dermatology

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Management of chronic Pseudomonas ear infections in dogs

Dr Peter Hill
BVSc PhD DVD DipACVD DipECVD MACVSc
School of Animal and Veterinary Sciences

Life Impact  The University of Adelaide
Development of ear infections

Infection with commensals

- Staph pseudintermedius
- Streptococcus canis
- Malassezia pachydermatis
Development of ear infections

Infection resolves

Neomycin ear drops
Development of ear infections

Mixed infection
Staph and E. Coli

Infection resolves
Development of ear infections

Mixed infection
Staph and Pseudomonas

Resistant to Neomycin

Neomycin ear drops
Development of ear infections

Pure infection
Neomycin resistant
Pseudomonas

Gentamycin ear drops

Resistant to gentamycin
Development of ear infections

Pure infection
Neomycin and Gentamycin resistant Pseudomonas

Fluoroquinolone ear drops

Resistant to fluoroquinolones
Development of ear infections

Pure infection
Neomycin, Gentamycin and Fluoroquinolone resistant Pseudomonas
Development of ear infections

Pure infection
Neomycin, Gentamycin and Fluoroquinolone resistant Pseudomonas
<table>
<thead>
<tr>
<th>Lab Report</th>
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<tbody>
<tr>
<td><em>Pseudomonas aeruginosa</em></td>
</tr>
<tr>
<td>Neomycin</td>
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<tr>
<td>Polymyxin B</td>
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<tr>
<td>Gentamycin</td>
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<tr>
<td>Enrofloxacin</td>
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<tr>
<td>Ticarcillin</td>
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<td>Cephalexin</td>
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<tr>
<td>TMS</td>
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<tr>
<td>Amoxy / clav</td>
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<td>Ampicilllin</td>
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</tbody>
</table>
Development of otitis media

- Semicircular canals
- Cochlea
- Ossicles
- Tympanic bulla
Development of otitis media

- Tympanic bulla
- Malleus
- Incus
- Stapes
- Oval window
- Round window

Proteases
Collagenases
Elastases
Lysozymes

Tympanic bulla
Diagnosis and Management

Step 1 - Cytology ± culture and sensitivity testing

Step 2 - Otoscopy and evaluation of the tympanic membrane

(Step 3 - Diagnostic imaging - Radiography/CT/MRI)

(Step 4 - Middle ear flushing)

Step 5 - Selecting appropriate systemic and topical antibiotics

Step 6 - Dealing with the underlying causes

Step 7 - Follow-up rechecks
Diagnosis and Management

- Cytology ± culture and sensitivity testing
- Evaluation of the tympanic membrane
- Selecting appropriate antibiotics/anti-fungals
- Identifying and treating the underlying cause

Otitis externa

Radiography/CT/MRI
Middle ear flushing

Otitis media
Diagnosis and Management

Step 1 - Cytology ± culture and sensitivity testing

Step 2 - Otoscopy and evaluation of the tympanic membrane
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(Step 4 - Middle ear flushing)

Step 5 - Selecting appropriate systemic and topical antibiotics

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Step 7 - Follow-up rechecks
Cytology
Cytology + culture and sensitivity testing
Diagnosis and Management

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Otoscopy and evaluation of the tympanic membrane
Otoscopy
Evaluation of the tympanic membrane
Evaluation of the tympanic membrane

Canine
Evaluation of the tympanic membrane

Feline
Evaluation of the tympanic membrane
Diagnosis and Management

Step 1 - Cytology ± culture and sensitivity testing

Step 2 - Otoscopy and evaluation of the tympanic membrane

(Step 3 - Diagnostic imaging - Radiography/CT/MRI)

(Step 4 - Middle ear flushing)

Step 5 - Selecting appropriate systemic and topical antibiotics

Step 6 - Dealing with the underlying causes

Step 7 - Follow-up rechecks
Radiography
Radiography

Rostro-caudal (open mouthed) view
Radiography
Radiography

Ventro-dorsal view
Radiography

Lateral view
Diagnosis and Management

Step 1 - Cytology ± culture and sensitivity testing

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(Step 4 - Middle ear flushing)

Step 5 - Selecting appropriate systemic and topical antibiotics

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Step 7 - Follow-up rechecks
Middle ear flushing
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Middle ear flushing
Diagnosis and Management

Step 1 - Cytology ± culture and sensitivity testing

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Step 7 - Follow-up rechecks
Selecting appropriate systemic and topical antibiotics
Selecting appropriate systemic and topical antibiotics

1. Gentamycin – Mometamax / Otomax
2. Polymyxin B – Surolan / Dermotic
3. Fluoroquinolones – Baytril injectable / otic
4. Ticarcillin/clavulanic acid – Timentin
5. Tris EDTA - Dermapet
6. Silver sulfadiazine cream
Selecting appropriate systemic and topical antibiotics
Selecting appropriate systemic and topical antibiotics
Selecting appropriate systemic and topical antibiotics
Diagnosis and Management

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Step 6 - Dealing with the underlying causes

Step 7 - Follow-up rechecks
Dealing with the underlying causes

The Three P’s

Predisposing factors

Primary causes

Ear infection

Perpetuating factors

Ear infection
Predisposing Factors

- Pendulous pinnae
- Hairy ear canals
- Narrow ear canals
- Excessive wax production
- Swimming
Predisposing factors
Primary Causes

- Foreign bodies (esp. grass seeds)
- *Otodectes cynotis* infestation
- Atopic dermatitis
- Food allergy
- Ear canal tumours
- Adverse reaction to ear medication
- Hormonal diseases
- Otic demodicosis
Primary causes
Perpetuating factors

- Bacterial resistance (esp. Pseudomonas, Proteus)
- Otitis media
- Progressive narrowing of the ear canals
- Ear canal fibrosis
- Ear canal calcification
- Bulla osteomyelitis
Ear canal narrowing
Dealing with the underlying causes