

# *Malassezia pachydermatis*

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*Malassezia pachydermatis* infection is frequently undiagnosed, as making a diagnosis is often difficult when clinical signs overlap a number of other clinical conditions (eg, atopic dermatitis, seborrhea). In addition, there are no consistently effective quantitative cytology techniques.

Response-to-treatment trials are an important component in diagnosing *Malassezia* spp dermatitis.<sup>1,2</sup> Treatment should be considered when yeast has been identified on cytology in a patient showing clinical signs compatible with *Malassezia* spp dermatitis. Recurrent *M pachydermatis* overgrowth is common and often secondary to underlying conditions (eg, allergies, seborrhea, endocrinopathies, skinfolds).

In addition to acute management of infection, treatment success relies on appropriate diagnosis and management of predisposing conditions.

## SYSTEMIC THERAPY

### Ketoconazole

**Dogs:** 5-10 mg/kg PO once a day for 2-4 weeks<sup>1-3</sup>

**Cats:** Not recommended because of high incidence of side effects<sup>1,2</sup>

Ketoconazole, an imidazole antifungal, impairs ergosterol synthesis in fungal cell walls by inhibiting cytochrome P450 14  $\alpha$ -demethylase (CYP51). Ketoconazole has efficacy against a wide range of fungal organisms and has been shown to have anti-inflammatory effects.<sup>4</sup>

▶ Most commonly used systemic treatment for dermatitis caused by *M pachydermatis* in dogs<sup>4</sup>

### Itraconazole

**Dogs:** Daily treatment, 5-10 mg/kg PO once a day for 2-4 weeks<sup>1-3</sup>; pulse treatment, 5-10 mg/kg PO for the first 2 days of each week<sup>2,5</sup>

**Cats:** 5-10 mg/kg PO once a day for 2-4 weeks<sup>1,2</sup>

Itraconazole, a triazole antifungal, inhibits CYP51, resulting in impaired ergosterol synthesis in fungal cell walls.<sup>1,2,5</sup> Itraconazole is lipophilic and highly protein-bound, and therapeutic levels persist in the skin days to weeks after treatment is stopped.<sup>1,2,5</sup> This principle likely explains why pulse treatment appears to be effective.<sup>5</sup>

### Fluconazole

**Dogs:** 5-10 mg/kg PO once a day for 2-4 weeks<sup>1,2,6,7</sup>

## Although many topical products are available for treating *Malassezia* spp dermatitis, only a few controlled studies have documented efficacy.<sup>3,11</sup>

**Cats:** Fluconazole treatment of *M pachydermatis* infections in cats has not been studied.

Like itraconazole, fluconazole is a triazole antifungal that impairs ergosterol synthesis in fungal cell walls via inhibition of CYP51.<sup>1,2,6,7</sup> Fluconazole is comparable in efficacy to ketoconazole in treating *Malassezia* spp dermatitis in dogs.<sup>6</sup>

### Terbinafine

**Dogs:** 30 mg/kg PO once a day<sup>8,9</sup> or 30 mg/kg PO for 2 consecutive days each week for 3-4 weeks<sup>10</sup>

**Cats:** Terbinafine treatment of *M pachydermatis* infections in cats has not been studied.

Terbinafine, an allylamine antifungal drug, inhibits ergosterol synthesis and squalene epoxidase, resulting in ergosterol deficiency and squalene accumulation in fungal cell walls. It does not inhibit cytochrome P450 enzymes. Although terbinafine has been shown to reduce *M pachydermatis* populations and dermatitis in dogs treated for 3 weeks, longer durations of therapy or adjunctive use of topical agents may be necessary to achieve resolution.<sup>8,9,10</sup>

### Griseofulvin

**Dogs, cats:** Not recommended for use in dogs or cats<sup>1,2</sup>

Griseofulvin inhibits cell mitosis and nucleic acid synthesis in fungal organisms by interfering with spindle microtubules. However, this agent is not effective in treating *Malassezia* spp dermatitis in dogs or cats.

CYP51 = cytochrome P450 14  $\alpha$ -demethylase

## TOPICAL THERAPY

### Antifungal Shampoos

**Dogs, cats:** Some topical products supported by clinical evidence<sup>3,11</sup>

- ▶ Strong evidence supports twice-weekly use of 2% miconazole + 2% chlorhexidine shampoo.<sup>3</sup>
  - For both dogs and cats, including puppies and kittens
- ▶ Once- or twice-daily application of 0.3% chlorhexidine + 0.5% climbazole and Tris-EDTA wipe has been shown to reduce *M pachydermatis* populations in naturally infected dogs.<sup>11</sup>
  - For dogs only
  - May also be effective in dogs with localized overgrowth of *M pachydermatis*

Antifungal shampoos can be an important component in treating *Malassezia* spp dermatitis. For mild-to-moderate or localized infections, they may be the sole therapy. For generalized or severe infections, topical therapy should be combined with systemic therapy.

- ▶ Although many topical products are available for treating *Malassezia* spp dermatitis, only a few controlled studies have documented efficacy.<sup>3,11</sup>
- ▶ Further studies are needed to evaluate other topical products. ■

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# Meloxidyl® (meloxicam)

ANADA 200-550, approved by FDA.  
\*Please read entire package insert before use.  
**Meloxidyl®**  
(meloxicam) 1.5 mg/mL Oral Suspension

Non-steroidal anti-inflammatory drug for oral use in dogs only

**Caution:** Federal law restricts this drug to use by or on the order of a licensed veterinarian.

**Indications:** Meloxidyl Oral Suspension is indicated for the control of pain and inflammation associated with osteoarthritis in dogs.

**Contraindications:** Dogs with known hypersensitivity to meloxicam should not receive Meloxidyl Oral Suspension. **Do not use Meloxidyl Oral Suspension in cats. Acute renal failure and death have been associated with the use of meloxicam in cats.**

**Warning:** Repeated use of meloxicam in cats has been associated with acute renal failure and death. Do not administer additional injectable or oral meloxicam to cats. See Contraindications, Warnings, and Precautions for detailed information.

**Warnings:** Not for use in humans. Keep this and all medications out of reach of children. Consult a physician in case of accidental ingestion by humans. **For oral use in dogs only.**

As with any NSAID, all dogs should undergo a thorough history and physical examination before the initiation of NSAID therapy. Appropriate laboratory testing to establish hematological and serum biochemical baseline data is recommended prior to and periodically during administration. Owner should be advised to observe their dog for signs of potential drug toxicity and be given a client information sheet about Meloxidyl Oral Suspension.

**Precautions:** The safe use of Meloxidyl Oral Suspension in dogs younger than 6 months of age, dogs used for breeding, or in pregnant or lactating dogs has not been evaluated. Meloxicam Oral Suspension is not recommended for use in dogs with bleeding disorders, as safety has not been established in dogs with these disorders. As a class, cyclo-oxygenase inhibitory NSAIDs may be associated with gastrointestinal, renal and hepatic toxicity. Sensitivity to drug-associated adverse events varies with the individual patient. Dogs that have experienced adverse reactions from one NSAID may experience adverse reactions from another NSAID. Patients at greatest risk for renal toxicity are those that are dehydrated, on concomitant diuretic therapy, or those with existing renal, cardiovascular, and/or hepatic dysfunction. Concurrent administration of potentially nephrotoxic drugs should be carefully approached. NSAIDs may inhibit the prostaglandins that maintain normal homeostatic function. Such antiprostaglandin effects may result in clinically significant disease in patients with underlying or pre-existing disease that has not been previously diagnosed. Since NSAIDs possess the potential to induce gastrointestinal ulcerations and/or perforations, concomitant use with other anti-inflammatory drugs, such as NSAIDs or corticosteroids, should be avoided. If additional pain medication is needed after administration of the total daily dose of Meloxidyl Oral Suspension, a non-NSAID or non-corticosteroid class of analgesia should be considered. The use of another NSAID is not recommended. Consider appropriate washout times when switching from corticosteroid use or from one NSAID to another in dogs. The use of concomitantly protein-bound drugs with Meloxidyl Oral Suspension has not been studied in dogs. Commonly used protein-bound drugs include cardiac, anticonvulsant and behavioral medications. The influence of concomitant drugs that may inhibit metabolism of Meloxidyl Oral Suspension has not been evaluated. Drug compatibility should be monitored in patients requiring adjunctive therapy.

**Adverse Reactions:** Field safety was evaluated in 306 dogs. Based on the results of two studies, GI abnormalities (vomiting, soft stools, diarrhea, and inappetence) were the most common adverse reactions associated with the administration of meloxicam. The following table lists adverse reactions and the numbers of dogs that experienced them during the studies. Dogs may have experienced more than one episode of the adverse reaction during the study.

In foreign suspected adverse drug reaction (SADR) reporting over a 9 year period, incidences of adverse reactions related to meloxicam administration included: auto-immune hemolytic anemia (1 dog), thrombocytopenia (1 dog), polyarthritis (1 dog), nursing puppy lethargy (1 dog), and pyoderma (1 dog).

| Adverse Reactions Observed During Two Field Studies |                   |                 |
|---|-------------------|-----------------|
| Clinical Observation                                | Meloxicam (n=157) | Placebo (n=149) |
| Vomiting  | 45                | 23              |
| Diarrhea/Soft Stool                                 | 19                | 11              |
| Bloody Stool  | 1                 | 0               |
| Inappetence   | 5                 | 1               |
| Bleeding Gums After Dental Procedure                | 1                 | 0               |
| Lethargy/Sedated Cat                                | 1                 | 0               |
| Erythema  | 1                 | 0               |

#### Post-Approval Experience: (Rev 2010)

The following adverse events are based on post-approval adverse drug experience reporting. Not all adverse reactions are reported to FDA/CVM. It is not always possible to reliably estimate the adverse event frequency or establish a causal relationship to product exposure using these data. The following adverse events are listed in decreasing order of frequency by body system.

**Gastrointestinal:** vomiting, anorexia, diarrhea, melena, gastrointestinal ulceration

**Urinary:** azotemia, elevated creatinine, renal failure

**Neurological/Behavioral:** lethargy, depression

**Hepatic:** elevated liver enzymes

**Dermatologic:** pruritus

Death has been reported as an outcome of the adverse events listed above. **Acute renal failure and death have been associated with use of meloxicam in cats.**

**Effectiveness:** The effectiveness of meloxicam was demonstrated in two field studies involving a total of 277 dogs representing various breeds, between six months and sixteen years of age, all diagnosed with osteoarthritis. Both of the placebo-controlled, masked studies were conducted for 14 days. All dogs received 0.2 mg/kg on day 1. All dogs were maintained on 0.1 mg/kg oral meloxicam from days 2 through 14 of both studies. Parameters evaluated by veterinarians included lameness, weight-bearing, pain on palpation, and overall improvement. Parameters assessed by owners included mobility, ability to rise, limping, and overall improvement. In the first field study (n=109), dogs showed clinical improvement with statistical significance after 14 days of meloxicam treatment for all parameters. In the second field study (n=48), dogs receiving meloxicam showed a clinical improvement after 14 days of therapy for all parameters; however, statistical significance was demonstrated only for the overall investigator evaluation on day 7, and for the owner evaluation on day 14.

**How Supplied:** Meloxidyl® 1.5 mg/mL Oral Suspension: 10, 32, 100 and 200 mL bottles with small and large dosing syringes.

**Storage:** Store at controlled room temperature 68-77° F (20-25° C).

**Manufactured for:** Ceva Santé Animale, S.A.

**Marketed by:** Ceva Animal Health, LLC, Lenexa, KS 66215

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## ASK THE EXPERTS ▶ OPHTHALMOLOGY ▶ CONTINUED FROM PAGE 86

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### Suggested Reading

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