

# Comparison of the Efficacy of Cefpodoxime Proxetil and Cephalexin in Treating Bacterial Pyoderma in Dogs

Judith A. Cherni, DVM  
Joseph F. Boucher, MS  
Terry L. Skogerboe, DVM, MBA  
Stephanie Tarnacki, BS  
Kimberly D. Gajewski, MS  
Cynthia J. Lindeman, BS

*Pfizer Animal Health  
Kalamazoo, Michigan*

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## ABSTRACT

One hundred fifty-seven dogs with bacterial pyoderma were allocated randomly to receive 5 mg/kg oral cefpodoxime proxetil once daily or 26.4 mg/kg oral cephalexin twice daily for 28 or 42 days. One hundred twenty-nine dogs (63 cefpodoxime proxetil, 66 cephalexin) were included in the efficacy evaluation. Bacterial folliculitis was the predominant diagnosis, with *Staphylococcus intermedius* cultured from 113 dogs before treatment. At the final clinical assessment, 96.8% of the cefpodoxime proxetil group and 93.9% of the cephalexin group were treatment successes, with a treatment difference of 2.9% (90% confidence interval, -4.7 to 10.5). Thus, cefpodoxime proxetil was non-inferior to cephalexin. Cefpodoxime proxetil administered once daily for 28 or 42 days was safe and effective against canine bacterial pyoderma.

## INTRODUCTION

Staphylococcal pyoderma is 1 of the most common skin diseases diagnosed in dogs,

and *Staphylococcus intermedius* is implicated in approximately 90% of cases.<sup>1</sup> Staphylococci belong to the resident flora of the dog's hair coat, skin, nasal and oral mucosa, respiratory tract, and anus. Disruptions in the skin surface microenvironment allow resident flora to become pathogenic. Underlying conditions, such as atopy, genodermatoses, parasitic infestations, or endocrinopathies, promote bacterial adherence and colonization.<sup>2</sup> In dogs with pyogenic infections, gram-negative bacteria, such as *Proteus* spp., *Pseudomonas* spp., and *Escherichia coli*, are frequently secondary invaders.

Staphylococcal pyoderma can be classified into 3 categories, depending on the depth of skin involvement. In surface pyoderma, over-colonization of the stratum corneum occurs, resulting in "hot spots," intertrigo, or mucocutaneous pyoderma. Invasion of the epithelium or hair follicle results in superficial bacterial pyoderma, such as impetigo or staphylococcal folliculitis. Common underlying conditions of superficial infection include allergic dermatoses, demodicosis, and endocrinopathies. Furunculosis or deep pyoderma develops

when the epidermis is breached, allowing infection of the underlying dermis. In rare cases, deep pyoderma progresses to cellulitis, which often indicates a more severe predisposing condition.

Cephalosporins are often used to treat canine skin infections because of their broad antimicrobial spectrum, established safety profile, and reasonable cost. Cephalosporins are active against gram-positive aerobes and anaerobes, penicillinase-producing staphylococci, and some gram-negative anaerobes. Cephalexin, cefadroxil, and cephalothin have all been recommended for use in treating canine pyoderma.<sup>3</sup> Generic cephalixin is a frequent choice due to its efficacy<sup>4</sup> and low cost, although the drug is not approved for use in veterinary medicine. Cephalexin must be administered orally 2 or 3 times daily,<sup>3,4</sup> requiring multiple capsules for each 20-30 mg/kg (9-15 mg/lb) dose in large dogs. Cefadroxil, administered orally twice daily, is approved for treating canine skin, urinary tract, and respiratory infections.<sup>5,6</sup>

Recently, cefpodoxime proxetil was approved for treating skin infections (wounds and abscesses) in dogs.<sup>7,8</sup> Once-daily administration sets it apart from other oral cephalosporins used in veterinary medicine in the United States. A single 100-mg or 200-mg tablet can be used to treat most dogs (5-10 mg/kg, 2.3-4.5 mg/lb). For the label indication (wounds and abscesses), treatment with cefpodoxime proxetil is recommended for 5 to 7 days, or for 2 to 3 days beyond the cessation of clinical signs, up to a maximum of 28 days. In the treatment of canine bacterial pyoderma, it is often recommended to continue treatment with antimicrobials for 7 to 21 days (depending on the severity of the infection) after surface healing has occurred.<sup>9</sup> Although cefpodoxime proxetil is not labeled for use in canine bacterial pyoderma, its pharmacokinetic properties and safety profile suggest it might be an ideal alternative to currently used antimicrobials for treatment of superficial and deep pyoderma.

Cefpodoxime proxetil is a prodrug that is de-esterified *in vivo* to release the active moiety, cefpodoxime free acid. Cefpodoxime exerts its inhibitory effect by interfering with cell wall synthesis. Cefpodoxime is bactericidal and resistant to hydrolysis by a wide variety of penicillinases and cephalosporinases,<sup>10</sup> with a stability profile typical of oxime-type cephalosporins. It is extensively distributed in human body fluids and tissues after oral administration, with virtually 100% penetration of inflammatory fluid.<sup>11</sup> Cefpodoxime has a broad spectrum of antibacterial activity against clinically relevant veterinary pathogens, including gram-positive (*Staphylococcus* spp., *Streptococcus* spp.) and gram-negative bacteria (*Escherichia* spp., *Proteus* spp.) known to cause both acute and chronic skin infections.<sup>7</sup>

The pharmacokinetic properties of cefpodoxime proxetil provide a strong rationale for once-daily dosing in the treatment of canine superficial pyoderma, in particular *S intermedius*-associated pyoderma. After a single 100-mg tablet (approximately 10 mg/kg) of cefpodoxime proxetil was administered to 12 dogs, the peak plasma concentration ( $C_{max}$ ) was 17.8 (+ 0.402)  $\mu\text{g/mL}$ .<sup>12</sup> The plasma concentration 24 hours later was 0.893 (+ 0.402)  $\mu\text{g/mL}$ . After oral administration, the apparent elimination half-life of cefpodoxime is approximately 5.5 to 6 hours. A study in which interstitial tissue fluid samples collected from dogs were analyzed using a microdialysis technique demonstrated that cefpodoxime proxetil administered as a single oral dose of 5 mg/kg achieved interstitial fluid levels above 1  $\mu\text{g/mL}$  around 3 hours after dosing and fell below 1  $\mu\text{g/mL}$  approximately 7 hours after dosing.<sup>8</sup> Interstitial fluid concentrations fell below 0.5  $\mu\text{g/mL}$  at approximately 9 hours after dosing. These interstitial fluid concentrations of cefpodoxime suggest that it would be effective for the treatment of *S intermedius* superficial pyoderma, as the minimal inhibitory concentration ( $\text{MIC}_{90}$ ) value of *S inter-*

*medius* isolates from a 2002 field efficacy study was 0.5 µg/mL.

This study was designed to compare the clinical efficacy of cefpodoxime proxetil with cephalexin in treating canine pyoderma under field conditions.

## MATERIALS AND METHODS

### Animals

Privately owned dogs of either sex (whether intact, spayed, or neutered), any age (including puppies and adolescents), or any breed (or mixture of breeds) were considered for enrollment at 13 veterinary hospitals in the United States. Inclusion criteria included the presence of significant bacterial pyoderma characterized by 1 or more of the following clinical signs: papules, pustules, nodules, furuncles, erosion/ulceration, purulent discharge, erythema, swelling, or epidermal collarettes. At least 1 of the observed signs had to be moderate or severe. In addition, the presence of pathogenic bacteria was confirmed by microbiological culture of a sample collected from the site of infection prior to treatment. The determination of efficacy of the treatment was based on monitoring of changes in these clinical signs during the course of the study. Dog owners gave written consent for treatment and were responsible for normal husbandry and drug administration.

### Initial Evaluation

Examining veterinarians at each hospital evaluated the dog's history, performed a physical examination, and weighed the animal. The diagnosis of bacterial pyoderma was based on this examination and the presence of the clinical signs listed previously, which were scored as absent, mild, moderate, or severe. Exclusion criteria included: dogs <8 weeks of age, weighing <20 lb, or intended for breeding; animals with chronic underlying disease, sarcoptic or demodectic mange, dermatophytosis or *Malassezia* dermatitis; systemic or topical antibiotics or corticosteroids administered within 1 week of enrollment; long-acting corticosteroids

administered within 30 days of enrollment; or known sensitivity to β-lactam drugs. No disinfectants, antiseptics, or antimicrobial drugs (other than cefpodoxime proxetil or cephalexin) could be administered during the study. Other concomitant treatments were allowed but shampooing was not.

At the time of enrollment, samples were taken for microbiologic culture and identification at a commercial laboratory (LabCorp, Burlington, NC). Identification of organisms was made to the species level, where possible, based on morphology, gram stain, growth characteristics, standard individual biochemical testing, or commercially available identification tests kits. Minimal inhibitory concentrations were determined for cefpodoxime and 7 comparators against all pathogens isolated. All testing was conducted using a commercially available broth microdilution system (Sensititre Division, Trek Diagnostic Systems Inc., Cleveland, OH) that conforms to the standards of the Clinical and Laboratory Standards Institute (CLSI) broth microdilution method.<sup>13</sup> Cation-adjusted Mueller Hinton broth (CAMHB) supplemented with lysed horse blood was used as growth medium for all streptococci isolates. All remaining strains were tested using CAMHB with no supplementation. The following CLSI-recommended quality control strains were tested: *Escherichia coli* ATCC 25922, *Pseudomonas aeruginosa* ATCC 27853, *Enterococcus faecalis* ATCC 29212, and *Staphylococcus aureus* ATCC 29213. For a case to continue in the study, the diagnosis of bacterial pyoderma was confirmed by the presence of bacteria in the pretreatment culture. All lesions considered to be treatment failures at final evaluation were similarly cultured.

### Treatment Groups

Patients were assigned randomly to treatment groups according to a pre-assigned, site-specific, randomization schedule. A treatment administrator determined the dose based on the animal's body weight and a

dosing chart (Table 1), and dispensed medications to owners to ensure masking to treatment of the examining veterinarian.

Dogs received either: cefpodoxime proxetil (Simplicef® Tablets, Pfizer Inc., New York, NY) ~5 mg/kg body weight (~2.5 mg/lb) once daily for 28 days; or a positive control, cephalexin (Cephalexin Capsules, Teva Pharmaceuticals USA, Sellersville, PA) ~26 mg/kg body weight (~12 mg/lb) twice daily for 28 days. (Cefpodoxime proxetil dosages are expressed in terms of the active form of the drug, cefpodoxime.) An acceptable dosage range was included in the dosing chart because of tablet and capsule size restrictions. Cefpodoxime proxetil 100-mg tablets could be split in half with a pill cutter for dispensing purposes. After the initial 28-day treatment period, an additional 14-day course of treatment could be administered at the discretion of the examining veterinarian. Veterinarians could remove animals from the study or change therapy at any time during the study, if it was in the best interest of the patient to do so. All patients removed from the study due to lack of improvement were considered clinical treatment failures.

### Variables Measured

Clinical observations were made for each dog on Days 14, 21, and 28. Final evaluations occurred on Days 28 and 42, if needed. On Day 28 or 42, the veterinarian assessed the overall clinical outcome using the same clinical signs listed previously. Bacterial samples

were also collected from any animals withdrawn from the study for having an inadequate response to therapy.

The primary determinant of efficacy was a binary response variable (success/failure) based on the change in clinical signs from baseline (Day 0, the day of initial treatment) to Day 28 or 42. Treatment was considered successful if all the clinical signs classified as moderate or severe on Day 0 were reduced to mild or absent at final evaluation on Day 28 or 42. In addition, veterinarians were asked to assess clinical outcome by classifying dogs as cured, improved, or

**Table 1.** Dosing Guidelines.\*

Cefpodoxime Proxetil			
Body Weight (lb)	Total Dose (mg)	Dosage Range (mg/lb)	Equivalent Tablet Potency (mg)
20.0 - 29.9	50	1.67 - 2.50	50
30.0 - 49.9	100	2.00 - 3.33	100
50.0 - 69.9	150	2.14 - 3.00	50 + 100
70.0 - 89.9	200	2.22 - 2.86	200
90.0 - 109.9	250	2.27 - 2.78	50 + 200
110.0 - 129.9	300	2.31 - 2.73	100 + 200
130.0 - 149.9	350	2.33 - 2.69	50 + 100 + 200
150.0 - 169.9	400	2.35 - 2.67	200 + 200
170.0 - 189.9	450	2.30 - 2.65	50 + 200 + 200
Cephalexin			
Body Weight (lb)	Total Dose (mg)	Dosage Range (mg/lb)	Equivalent Capsule Potency (mg)
20.0 - 31.2	250	8.02 - 12.5	250
31.3 - 52.0	500	9.62 - 15.99	500
52.1 - 72.8	750	10.30 - 14.40	250 + 500
72.09 - 93.7	1000	10.68 - 13.71	500 + 500
93.8 - 114.5	1250	10.92 - 13.33	250 + 500 + 500
114.6 - 135.3	1500	11.08 - 13.09	500 + 500 + 500
135.4 - 156.2	1750	11.21 - 12.92	250 + 500 + 500 + 500
156.3 - 177.0	2000	11.30 - 12.80	500 + 500 + 500 + 500
177.1 - 197.8	2250	11.37 - 12.70	250 + 500 + 500 + 500 + 500

\*Expressed in mg/lb to accommodate usual clinical practice.

failed at final evaluation. The veterinarian recorded abnormal health observations noted during scheduled visits and for any conditions reported by owners, whether or not the animal had been examined. All treatments administered to the animals during the study were recorded in the patient charts.

### Statistical Analysis

For efficacy analysis, a per protocol population was defined, consisting of animals randomized to treatment that met all of the inclusion criteria, none of the exclusion criteria, received at least 1 dose, and had sufficient observations for evaluation. A non-inferiority test (StatXact 5 Statistical Software for Exact Nonparametric Inference User Manual, Cambridge, MA: CYTEL Software Corp; 2001) was conducted on the per-protocol population for the primary efficacy variable calculated at Day 28 or 42 between the percent success of the 2 treatments. Non-inferiority was concluded if the 1-sided lower limit of the difference between percent success exceeded the non-inferiority margin. The confidence interval was determined using the normal approximation to the binomial with continuity correction. The confidence interval calculation did not make an adjustment for clinics, although the treatment by clinic interaction was investigated by graphical and statistical methods. A 2-sided 90% confidence interval was calculated (1-sided 95%) and a non-inferiority margin of 15 percentage points was used.

**Table 2.** Characteristics of Enrolled Animals, n (%).

	Cefpodoxime Proxetil	Cephalexin
Total enrolled	78	79
Number of purebred dogs	60 (38.2)	62 (39.5)
Number of mixed-breed dogs	18 (11.5)	17 (10.8)
Age range (years)	0.4-12	0.3-16
Male, intact	12	14
Male, neutered	35	29
Female, intact	2	6
Female, spayed	29	30
Weight range (lb)	20.2-148.0	22.2-137.8
No. of animals assessed for clinical success or failure	63	66

## RESULTS

A total of 157 dogs were enrolled in the study from March 8, 2004, to October 14, 2004 (Table 2). Sixty purebred and 18 mixed-breed dogs were in the cefpodoxime proxetil group, and 62 purebred and 17 mixed-breed dogs were in the cephalexin group. Of the 157 dogs that were enrolled in the study, 129 were included in the analysis of efficacy. Twenty eight dogs were not included in the analysis of efficacy: 12 were excluded for deviations from the protocol and 16 were withdrawn prior to study completion (Table 3).

Of the 129 dogs included in the analysis of efficacy (63 cefpodoxime proxetil, 66 cephalexin), 3 dogs failed to complete the study, but were included in the efficacy analysis for the following reasons: 1 completed enough study visits to be evaluable but whose owner was leaving the state (cephalexin); 1 removed for apparent lack of efficacy (cephalexin); and 1 dog required corticosteroid therapy for inflamed ears but completed enough study visits to be evaluable (cefpodoxime proxetil).

Bacterial folliculitis was the predominant diagnosis for 56 dogs (88.9%) enrolled in the cefpodoxime proxetil group and 56 (84.8%) in the cephalexin group. Other infections included acute moist dermatitis, deep pyoderma, pyotraumatic dermatitis, tail pyoderma, vaginal fold dermatitis, and acral lick granuloma, which were diagnosed in 17 dogs. The predominant isolated pretreatment pathogen was *S intermedius*, which was cultured from 113 dogs (55 cefpodoxime proxetil, 58 cephalexin).

Sixty-two percent of the dogs (80/129) had mixed-species infections and 38% (49/129) had single-species infections. A 28-day course of treatment was administered to 103 dogs (48 cefpodoxime proxetil, 55 cephalexin), and 26 dogs (15 cefpodoxime proxetil, 11 cephalexin) received an additional 14-day course of therapy at Day 28.

**Table 3.** Summary of Dogs Excluded/Removed From the Study Summary and Analysis.

Cases that were excluded due to protocol deviations	Number of Animals		Did the Animal(s) complete the study?
	Cefpodoxime proxetil (T01)	Cephalexin (T02)	
Negative pretreatment culture but allowed to complete the study	2	0	Yes
Failure to meet inclusion criteria	2	2	Yes
Receiving contraindicated medication while on study	2	0	Yes
Test article dosing discrepancies	0	2	Yes
Final study visit outside of appropriate interval	0	1	Yes
Final clinical evaluation outside appropriate interval	0	1	No
Cases that were withdrawn from the study	Cefpodoxime proxetil (T01)	Cephalexin (T02)	Did the Animal(s) complete the study?
Owner noncompliance	4	5	No
Negative pretreatment culture	2	0	No
Fulfilling one or more exclusion criteria	1	0	No
Development of an unrelated medical condition	0	1	No
Hurricane Francis left owner and clinic without power for 10 days	1	0	No
Delay in pretreatment culture submission	1	0	No
Laboratory not set up to accept culture samples	0	1	No
<b>Total</b>	<b>15</b>	<b>13</b>	

**Table 4.** Clinical and Veterinarian-Determined Cure at Final Assessment, n (%).

	Cefpodoxime	Cephalexin	90% Confidence Interval*
	Clinical Cure Rate		
Successes	61 (96.8)	62 (93.9)	-4.7, 10.5
Failures	2 (3.2)	4 (6.1)	
	Veterinarian Assessment		
Cured	52 (82.5)	53 (80.3)	NA
Improved	10 (15.9)	9 (13.6)	
Failed	1 (1.6)	4 (6.1)	

\*If the lower limit of 90% confidence interval is greater than -15%, then cefpodoxime proxetil is statistically not inferior to cephalexin. NA = not applicable.

Table 4 summarizes clinical successes and failures. At the final assessment (Day 28 or 42), 61 (96.8%) of the cefpodoxime proxetil-treated dogs and 62 (93.9%) of the cephalexin-treated dogs were treatment successes. Based upon the difference in treat-

ment success rates, cefpodoxime proxetil was not inferior to cephalexin at a non-inferiority margin of 15% (90% confidence interval: -4.7 to 10.5). Among the 123 cases that were treatment successes, 48 (76.2%) cefpodoxime proxetil-treated dogs and 55 (83.3%) cephalexin-treated dogs required one 28-day course of treatment. Of those dogs requiring an additional 14-day course of therapy, 13 (20.6%) dogs in the cefpodoxime proxetil group and 9 (13.6%) dogs in the cephalexin group were treatment successes at 42 days. In addition to the primary determinant of efficacy, each veterinarian participating in the study provided a final

**Table 5.** Frequency Distribution of MIC Values for Bacteria\* Cultured from Pretreatment Samples (all isolates).

Pathogen	Drug Tested	Number of Strains That Yielded Each Minimal Inhibitory Concentration Value (µg/mL)												
		No. of Isolates	≤0.03	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64
<i>Staphylococcus intermedius</i>	Cefpodoxime <sup>†</sup>	112		2	36	55 <sup>‡</sup>	3	2	2	5 <sup>§</sup>	3	2	2	2
	Cephalexin	112				4	77 <sup>‡</sup>	13	3	2	2	1	5 <sup>§</sup>	7
<i>Pseudomonas fluorescens</i> group	Cefpodoxime <sup>†</sup>	19											7	12 <sup>§§</sup>
	Cephalexin	19												19 <sup>§§</sup>
<i>Acinetobacter baumannii</i>	Cefpodoxime <sup>†</sup>	13						1	2	4 <sup>‡</sup>	5 <sup>‡</sup>	1		
	Cephalexin	13								1	1	1		11 <sup>§§</sup>
<i>Pantoea agglomerans</i>	Cefpodoxime <sup>†</sup>	12			1	4	4 <sup>‡</sup>	1	1 <sup>§</sup>	1				
	Cephalexin	12								4	6 <sup>‡</sup>	2 <sup>§</sup>		
<i>Escherichia coli</i>	Cefpodoxime <sup>†</sup>	12			1	6 <sup>‡</sup>	5 <sup>§</sup>							
	Cephalexin	12								4	8 <sup>§§</sup>			
<i>Streptococcus</i> species (Group G, beta-hemolytic)	Cefpodoxime <sup>†</sup>	10	9 <sup>§§</sup>	1										
	Cephalexin	10	4	1 <sup>‡</sup>	2	3 <sup>§</sup>								

\*Only organisms with 10 or more isolates are included

<sup>†</sup>Veterinary specific MIC interpretative criteria approved by the Clinical and Laboratory Standards Institute for cefpodoxime using the broth microdilution method: Susceptible <2 µg/mL, Intermediate 4 µg/mL, Resistant >8 µg/mL.

<sup>‡</sup>Concentration required to inhibit 50% of the organisms tested.

<sup>§</sup>Concentration required to inhibit 90% of the organisms tested.

resolved), or Failure (no apparent or inadequate response to therapy).

Forty-eight and 61 different concomitant medications were administered to dogs in the cefpodoxime proxetil group and the cephalexin group, respectively. These concomitant medications included heart-worm preventatives, flea control products, sedatives/tranquilizers, anesthetic agents, nonsteroidal anti-inflammatory agents, and routine vaccinations.

*Staphylococcus intermedius* was the most frequent pathogen isolated from all cases (Table 5). The MIC<sub>90</sub> of cefpodoxime proxetil for *S intermedius* was 4 µg/mL (0.06 to >64 µg/mL) and 64 µg/mL for cephalexin (0.5 to >64 µg/mL).

Abnormal clinical signs noted during the study are summarized in Table 6. Unrelated observations of abnormal health in the cefpodoxime

proxetil-treated dogs

were sporadic and included ear infections, lethargy, and diarrhea/soft stools of unknown origin, a puncture wound, gastroenteritis of undetermined origin, vomiting bile, vomiting of undetermined origin, porcupine quills in mouth, and diarrhea/soft stool due to dietary indiscretion. Unrelated

observations of abnormal health in cephalixin-treated dogs included ear infections, osteoarthritis, keratoconjunctivitis sicca, flea allergy dermatitis, foreign body ingestion, masseter muscle myositis, and a superficial abrasion/laceration. Soft stool secondary to oral antibiotic administration was observed in 1 cefpodoxime proxetil-treated dog from Days 14 to 21. No dogs in the cephalixin group were reported with abnormal health attributable to antibiotic administration. No deaths occurred in either group.

**Table 6.** Abnormal Clinical Signs, n (%).

	Cefpodoxime Proxetil	Cephalexin
Lethargy	2 (2.6)	1 (1.3)
Decreased/ decreased appetite	1 (1.3)	3. (3.8)
Vomiting	4 (5.1)	1 (1.3)
Diarrhea/soft feces	5 (6.4)	0 (0)
Other*	8 (10.3)	14 (17.1)

\*Other abnormal clinical signs included ear infection, otitis externa, torn left anterior cruciate ligament, ear irritation, ectoparasites/fleas, puncture wound, malassezia otitis, porcupine quills in the mouth, otitis, pruritus, wound, behavioral disorder, myelitis, and ocular discharge.

## DISCUSSION

In an earlier study, cefpodoxime proxetil was proven to be effective in treating canine wounds and abscesses.<sup>8</sup> That study compared cefpodoxime proxetil with amoxicillin/clavulanic acid. The clinical cure rate was 88.7% for cefpodoxime proxetil and 88.4% effective for amoxicillin/clavulanic acid. The present study compared cefpodoxime proxetil with cephalixin for the treatment of bacterial pyoderma. In a diverse population of canine patients with pyoderma treated at a number of veterinary hospitals, both drugs were effective with 96.8% of cefpodoxime-treated dogs and 93.9% of cephalixin-treated dogs treatment successes based on predefined criteria.

The safety of cefpodoxime proxetil is similar to other cephalosporins and has been documented in toxicity studies lasting 13 weeks in adult dogs and 28 days in puppies.<sup>7</sup> Pharmacokinetic studies identified a no observable adverse effects level for cefpodoxime proxetil tablets equivalent to doses of 220 mg/kg (485 mg/lb),<sup>12</sup> preserving a comfortable margin of safety for recommended doses. Most abnormal clinical signs observed during the study were judged to be unrelated to antibiotic treatment. Gastrointestinal upset (diarrhea/soft feces, vomiting, anorexia) was noted in both treatment groups, but did not result in stopping treatment for any dogs.

Cefpodoxime proxetil proved highly active against the bacteria isolated from pre-treatment cultures in this study. The MIC interpretative criteria (breakpoints) for cefpodoxime using the broth microdilution method are: susceptible <2 µg/mL, intermediate 4 µg/mL, resistant >8 µg/mL.<sup>14</sup> Although the clinical cure rates in both groups were excellent, resistant strains of *S. intermedius* were identified (7 in the cefpodoxime group, 15 in the cephalixin group). Of the 129 evaluable cases, only 1 cephalixin-treated dog with a resistant *S. intermedius* isolate was considered a clinical failure based on the changes in clinical signs from baseline. Based on the changes in clinical signs from baseline, the cases from which the 21 other resistant isolates were obtained were considered clinical cures.

In this study cefpodoxime proxetil administered at a dosage of ~5 mg/kg (~2.5 mg/lb) orally once daily for 28 to 42 days was as effective as cephalixin against naturally occurring canine bacterial pyoderma in dogs presented as veterinary patients. When 2 medications provide equivalent efficacy, choosing the product with the simplest dosing regimen should improve compliance. For dosing with cefpodoxime proxetil, treatment once daily is more likely to result in improved owner compliance with the veterinarians' pre-

scribed treatment regimen compared with cephalexin given twice daily, particularly over an extended treatment period as seen with bacterial pyoderma.

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