

Antimicrobial Use Guidelines

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The International Society for Companion Animal Infectious Diseases (ISCAID) Antimicrobial Guidelines Working Group was formed to develop guidelines for antimicrobial drug use in dogs and cats, because of concerns that antimicrobial drug resistance has dramatically increased in prevalence among isolates from dogs and cats in the last decade. The guidelines have been published in open access format so that they are widely available. Input has also been obtained from panels of Diplomates of relevant specialty groups.

Guidelines for treatment of urinary tract disease in dogs and cats (updated), respiratory infections in dogs and cats, and superficial pyoderma in dogs have been published (www.iscaid.org), and updated pyoderma guidelines are in press.¹⁻³ Recommendations are based on available data, whenever present, along with expert opinion, considering principles of infectious diseases, antimicrobial treatment, antimicrobial resistance, pharmacology, and internal medicine. Funding for studies on antimicrobial resistance in companion animals is badly needed. Clinical trials that evaluate antimicrobial drug regimes for bacterial infections in dogs and cats are encouraged.

Because of the increased prevalence of antimicrobial drug resistance, the need to properly document the presence of an infection before initiating antimicrobial drug treatment is more important than ever. In veterinary medicine, this may be at odds with client financial resources. However, inappropriate use of antimicrobial drugs is wasteful of client resources when an infection is not present or a multidrug resistant pathogen is present, and risks selection for antimicrobial resistant bacteria that may be harmful to the pet, other animals, and also humans that are in contact with the animal. Increasingly, veterinarians need to re-think the empiric use of antimicrobial drugs, especially when the underlying condition is not immediately life-threatening. An emphasis on rational antimicrobial treatment needs to be made to pet owners, as has been made in human medicine. The guidelines do not provide specific recommendations for hygiene and disinfection, but posters describing appropriate

measures and guideline documents are available from veterinary associations in North America and in Europe.

Some of the basic recommendations within the urinary and respiratory guidelines are summarized below. Doses of specific antimicrobial drugs are listed in the guidelines themselves.^{1,2}

RECOMMENDATIONS FOR URINARY TRACT DISEASE

Sporadic Cystitis

Definition: Sporadic bacterial infection of the bladder (< 3 UTIs per year).

The presence of urinary tract infection implies the presence of dysuria, pollakiuria, and/or stranguria. However, diagnosis of UTI cannot be made on the basis of clinical signs alone. Sediment analysis alone is not adequate for diagnosis because of the variable quality of interpretation, although the availability of artificial intelligence and virtual expert review is helping to overcome many problems.

Urinalysis and quantitative aerobic C&S testing should be performed in cats with lower urinary tract signs before starting antibiotics. Free-catch samples should not be used. Use of a novel rapid assay for detection of bacteriuria (RapidBac Vet, Silver Lake Research Corporation, <https://www.rapidbacvet.com/>) is encouraged for clients that cannot afford culture or when information on the presence or absence of bacteriuria is required at point-of-care. Studies to date have shown that this assay is highly sensitive and specific when compared with traditional culture, although it does not provide susceptibility information. For cystocentesis specimens following culture, counts $\geq 10^3$ CFU/mL indicate UTI. For catheterized specimens, counts $\geq 10^4$ in males and $\geq 10^5$ CFU/mL in females are significant. Bacterial isolation should only be attempted in clinics with appropriate laboratory facilities, proper biosafety containment and waste management, and adequately trained individuals. In-house “urine paddles” may be useful to rule out the presence of infection but these do not reliably identify bacteria and can generate false negative results.³

Treatment is indicated to relieve patient discomfort while awaiting C&S test results. Recommendations for initial treatment are amoxicillin (11 – 15 mg/kg PO q12h) or trimethoprim-sulfonamide (15 mg/kg PO q12h).

Veterinarians are encouraged to document and monitor resistance patterns among isolates from their hospital.

If C&S testing reveals a resistant isolate and there is a lack of clinical response, treatment should be changed to an appropriate antimicrobial drug.

Although treatment in the past has often been for 7 to 14 days, it is recommended that it be limited to 3-5 days.^{4,5}

Intra- or post-treatment urinalysis or urine culture are not indicated in the absence of ongoing clinical signs of UTI.

Recurrent UTI

Definition: the presence of 3 or more episodes of UTI during a 12-month period.

The same general principles as for sporadic cystitis apply. Efforts should be made to identify the underlying cause; consider referral. Treatment should be based on the results of C&S testing.

Although 4 weeks has been recommended for treatment, shorter durations are recommended (10-14 days), with a focus on clinical cure rather than microbiological cure (clearing the bacteriuria).

There is insufficient evidence to recommend “pulse” or chronic low-dose treatment, urinary antiseptics, and nutritional supplements such as cranberry juice extract for prevention of UTIs.

Subclinical Bacteriuria

Definition: presence of bacteria in the urine as determined by positive bacterial culture, in the absence of clinical signs of UTI. This is much more common than UTI.

Treatment may not be necessary, but could be considered if there is a high risk of ascending or systemic infection (e.g., patients with underlying renal disease). If the significance of the bacteriuria is unclear (e.g., whether it is contributing to lethargy or evidence of kidney disease), a short course of treatment (3-5 days) could be tried.

Urinary Catheters

Clinical signs of UTI are absent and a catheter is in place: no culture or treatment is indicated.

Removal of urinary catheters: urine culture is reasonable at the time of catheter removal if the risk and implications of a UTI are high, but in general culture is not recommended. There is no indication for routine use of prophylactic antimicrobials.

Clinical signs of UTI present (gross evidence of hematuria or flocculent urine in the collection system, fever): perform a culture after replacement of the urinary catheter with a new catheter. Several milliliters of urine should be removed to clear the catheter before a specimen is obtained for culture. Alternatively, remove the catheter and perform a cystocentesis. Culture from the collection bag, and culture of the catheter tip after removal are not recommended because biofilm forms on these materials and does not represent clinically meaningful information. Treatment should follow the guidelines for sporadic and recurrent cystitis above, and is more likely to be successful after catheter removal.

Pyelonephritis

C&S testing should always be performed.

Treatment should be initiated while awaiting culture results, using antimicrobials effective against Gram-negative *Enterobacterales*. A fluoroquinolone is a reasonable first choice, after which treatment should be based on C&S results. If combination treatment was used initially and C&S results indicate that both drugs are not required, the spectrum should be narrowed.

Treatment for 2 weeks is recommended until further information becomes available.

Culture is recommended 1 week after starting treatment and 1 week after treatment is discontinued.

RECOMMENDATIONS FOR RESPIRATORY DISEASE

Acute Upper Respiratory Tract Disease (URTD)

Consider an observation period of up to 10 days without antimicrobial treatment for cats with acute URTD that are eating and otherwise systemically well. Antimicrobial therapy should be considered if a mucopurulent nasal discharge is accompanied by fever, lethargy or anorexia. In the latter case, appropriate empiric therapy would be doxycycline (first choice)

followed by amoxicillin (the latter is not active against *Mycoplasma* spp.). The duration should be 7-10 days.

Avoid performing C&S on nasal discharge from cats with acute URTD.

If empiric antimicrobial therapy is ineffective, a diagnostic work-up is indicated.

Chronic Upper Respiratory Tract Disease

A diagnostic work-up is recommended. If treatable causes of nasal discharge are not identified, then nasal lavage or brushings could be submitted for C&S testing, and a nasal biopsy could be submitted for histopathology. Treatment should be based on these results. Should nasal discharge recur, the previously effective antimicrobial drug should be used for a minimum of 48 hours; if this is ineffective, only then a switch to a different class should be considered, provided a diagnostic work-up to rule out other causes of nasal discharge (tumors, fungal infection, foreign bodies etc) has been performed.

Bacterial Bronchitis

Airway lavage with cytologic examination and C&S testing is indicated if bacterial bronchitis is suspected

While awaiting results of the above tests, empiric treatment is recommended with doxycycline for 7 to 10 days. If this results in clinical improvement, treatment should be continued for 1 week past resolution of clinical signs.

Pneumonia

Antimicrobial therapy for pneumonia should be initiated as soon as possible and within 1-2 hours if signs of sepsis exist. Antimicrobial therapy should be parenteral while patients with pneumonia are hospitalized.

If there is no evidence of systemic sepsis, parenteral administration of a beta-lactam is recommended for empiric therapy; if signs of sepsis are present, then a combination of a fluoroquinolone and a drug that targets gram-positive bacteria and anaerobes (e.g., ampicillin or clindamycin) is recommended pending the results of C&S if possible. Animals should be re-evaluated for possible discontinuation of antimicrobials no later than 10 to 14 days after starting treatment.

Pyothorax

Pyothorax should be treated with IV fluids and drainage of pus after placement of chest tubes. Surgical debridement may be required for some animals.

Empiric antimicrobial therapy pending the results of C&S should be with a parenteral combination of a fluoroquinolone and a penicillin or clindamycin.

It has been recommended that treatment continue for at least 3 weeks and ideally 4-6 weeks, but the optimum duration is unknown. Cats should be re-evaluated 10 to 14 days after starting treatment.

References

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