

Respiratory Treatment Guidelines

Table 1. First-line antimicrobial options for bacterial respiratory infections in the dog and cat.

Infection Type	First-Line Drug Options
Acute bacterial upper respiratory infection (URI) in cats Chronic bacterial URI in cats	Doxycycline ^a or amoxicillin per os (PO)
Canine infectious respiratory disease complex (bacterial component) Bacterial bronchitis (dogs or cats)	Doxycycline or amoxicillin PO Base the choice on C&S ^b if available Doxycycline ^a or amoxicillin–clavulanate PO
Pneumonia in animals with extensive contact with other animals that have no systemic manifestations of disease (ie, fever, lethargy, dehydration) Pneumonia with or without clinical evidence of sepsis ^c	Doxycycline ^a PO Base changes if needed on clinical responses and C&S if available Doxycycline ^a PO Base changes if needed on clinical responses and C&S if available Parenteral administration of a fluoroquinolone ^d and a penicillin or clindamycin ^c initially Base oral drug choices to follow on clinical responses and C&S results if available
Pyothorax (dogs or cats) ^b	Parenteral administration of a fluoroquinolone ^d and a penicillin or clindamycin ^c initially combined with therapeutic lavage initially Base oral drug choices to follow on clinical responses and C&S results if available

Table 2. Antimicrobial treatment options for respiratory tract infections in the dog and cat.

Drug	Dose	Comments
Amikacin	Dogs: 15 mg/kg, IV/IM/SC, q24h Cats: 10 mg/kg, IV/IM/SC, q24h	Not recommended for routine use but might be useful for the treatment of multidrug-resistant organisms or if parenteral enrofloxacin or ciprofloxacin are contraindicated. Potentially nephrotoxic. Avoid in dehydrated animals and those with renal insufficiency
Amoxicillin	22 mg/kg, PO, q12h	Might be useful for the treatment of secondary bacterial URI caused by <i>Pasteurella</i> spp. and <i>Streptococcus</i> spp., some <i>Staphylococcus</i> spp. and many anaerobic bacteria. Ineffective against beta-lactamase-producing bacteria, most <i>Bordetella bronchiseptica</i> isolates, all <i>Mycoplasma</i> spp., and <i>Chlamydia felis</i> in cats. One Working Group member supports the use of amoxicillin q8h because of the short plasma half-life
Amoxicillin–clavulanate	Dogs: 11 mg/kg, PO, q12h Cats: 12.5 mg/kg, PO, q12h (dose based on combination of amoxicillin–clavulanate)	Used as a first-line option for secondary bacterial URI from <i>Pasteurella</i> spp., <i>Streptococcus</i> spp., methicillin-susceptible <i>Staphylococcus</i> spp. (including penicillinase-producing strains), many anaerobic bacteria, and most <i>B. bronchiseptica</i> isolates. Ineffective against all <i>Mycoplasma</i> spp., and inferior to other drugs for <i>C. felis</i> in cats. One Working Group member supports the use of amoxicillin q8h because of the short plasma half-life
Ampicillin-sulbactam	20 mg/kg, IV, IM, q6–8h	Used alone parenterally for cases with uncomplicated secondary bacterial pneumonia (Gram-positive and anaerobic bacteria). Used concurrently with another drug with wider Gram-negative activity if life-threatening disease exists
Ampicillin sodium	22–30 mg/kg, IV, SQ, q8h	Used parenterally for cases with uncomplicated secondary bacterial pneumonia (Gram-positive and anaerobic bacteria). Used concurrently with another drug with Gram-negative activity if life-threatening disease exists
Azithromycin	5–10 mg/kg, PO, q12h day 1 and then q3 days (Longer intervals are not indicated)	Used for primary bacterial diseases (in particular <i>Mycoplasma</i> spp.) and for pneumonia of undetermined etiology because the spectrum includes <i>Toxoplasma gondii</i> and <i>Neospora caninum</i>
Cefazolin	25 mg/kg, SQ, IM, IV, q6h	Used parenterally for cases with uncomplicated secondary bacterial pneumonia (Gram-positive and anaerobic bacteria). Used concurrently with another drug with wider Gram-negative activity if life-threatening disease exists. Ineffective against <i>B. bronchiseptica</i> , <i>Mycoplasma</i> spp., and <i>C. felis</i> in cats, and enterococci
Cefadroxil	Dogs: 11–22 mg/kg, PO, q12h Cats: 22 mg/kg, PO, q24h	Used PO for secondary bacterial URI from <i>Pasteurella</i> spp., and some <i>Staphylococcus</i> spp. and <i>Streptococcus</i> spp., and many anaerobic bacteria. Ineffective against <i>B. bronchiseptica</i> , <i>Mycoplasma</i> spp., and <i>C. felis</i> in cats, and <i>Enterococcus</i> spp. Resistance might be common in Enterobacteriaceae in some regions
Cefoxitin	10–20 mg/kg, IV, IM, q6–8h	Used parenterally for cases with secondary bacterial pneumonia (Gram-positive and anaerobic bacteria). Has a greater Gram-negative spectrum than first-generation cephalosporins. Ineffective against <i>B. bronchiseptica</i> , <i>Mycoplasma</i> spp., and <i>C. felis</i> in cats, and <i>Enterococcus</i> spp.
Cefovecin	8 mg/kg, SC, once. Can be repeated once after 7–14 days	Might be effective for the treatment of secondary bacterial URI caused by <i>Pasteurella</i> spp., some <i>Staphylococcus pseudintermedius</i> and <i>Streptococcus</i> spp. Ineffective for <i>B. bronchiseptica</i> , <i>Mycoplasma</i> spp., and <i>C. felis</i> in cats and <i>Enterococcus</i> spp. Pharmacokinetic data are available to support the use in dogs and cats, with a duration of 14 days (dogs) and 21 days (cats)
Cephalexin	22–25 mg/kg, PO, q12h	See cefadroxil comments
Chloramphenicol	Dogs: 50 mg/kg, PO, q8h Cats: 50 mg/cat, PO q12h	Reserved for multidrug-resistant infections with few other options. Effective for the primary bacterial pathogens, penetrates tissues well, and has an excellent spectrum against anaerobes and so might be considered for the treatment of pneumonia when the owner cannot afford dual antimicrobial agent treatment. Myelosuppression can occur, particularly with long-term treatment. Owners should be instructed to wear gloves when handling the drug because of rare idiosyncratic aplastic anemia in humans

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Table 2 (Continued)

Drug	Dose	Comments
Clindamycin	Dogs: 10 mg/kg, PO, SC, q12h Cats: 10–15 mg/kg, PO, SC, q12h	Activity against most anaerobic bacteria, many Gram-positive bacteria and some mycoplasmas. Not effective for most Gram-negative bacteria and some <i>Bacterioides</i> spp.
Doxycycline	5 mg/kg, PO, q12h Or 10 mg/kg, PO, q24h	Used for dogs or cats with URI, CIRDC, or bronchitis that is likely to be associated with <i>B. bronchiseptica</i> , <i>Mycoplasma</i> spp., and <i>C. felis</i> (cats). An injectable formulation is available if parenteral administration is needed. Either the hyclate or monohydrate salts can be used. Can be used in kittens and puppies >4 weeks of age without enamel discoloration
Enrofloxacin	Dogs: 5–20 mg/kg PO, IM, IV q24h Cats: 5 mg/kg, PO, q24h	Active against most isolates of <i>B. bronchiseptica</i> , <i>Mycoplasma</i> spp., and <i>C. felis</i> (cats) as well as many secondary Gram-negative and Gram-positive bacteria. Practically no activity against <i>Enterococcus</i> spp and anaerobic bacteria. Associated with risk of retinopathy in cats and so do not exceed 5 mg/kg/d of enrofloxacin in this species. All quinolones are associated with cartilage problems in growing puppies and kittens. Enrofloxacin is not approved for parenteral use in cats and is not soluble enough to be injected directly. It can precipitate and can chelate with cations in some fluid solutions. One Working Group member recommends never with the 5 mg/kg dose in dogs because of likely induction of resistant strains and 1 Working Group member does not recommend the drug for cats because the 5 mg/kg dose might induce resistance and higher doses can induce retinal degeneration
Gentamicin	Dogs: 9–14 mg/kg, IV, q24h Cats: 5–8 mg/kg, IV, q24h	Not recommended for routine use but might be useful for the treatment of multidrug-resistant organisms or if parenteral enrofloxacin is contraindicated. Potentially nephrotoxic. Avoid in dehydrated animals and those with renal insufficiency
Imipenem–cilastatin	3–10 mg/kg, IV, IM q8h	Reserve for the treatment of multidrug-resistant infections, particularly those caused by <i>Enterobacteriaceae</i> or <i>Pseudomonas aeruginosa</i> . Recommend consultation with a respiratory or infectious disease veterinary specialist or veterinary pharmacologist before use
Marbofloxacin	2.7–5.5 mg/kg PO q24h	Effective for the primary bacterial pathogens <i>B. bronchiseptica</i> , <i>Mycoplasma</i> spp., and <i>C. felis</i> (cats) as well as many secondary infections with Gram-negative and Gram-positive organisms. Limited efficacy against <i>Enterococcus</i> spp. and anaerobic bacteria. Available as an injectable solution in some countries
Meropenem	Dogs: 8.5 mg/kg SC q12h Or 24 mg/kg IV q12h Cats: 10 mg/kg q12h, SC, IM, IV	Reserve for the treatment of multidrug-resistant infections, particularly those caused by <i>Enterobacteriaceae</i> or <i>P. aeruginosa</i> . Recommend consultation with an infectious disease veterinary specialist or veterinary pharmacologist before use
Minocycline	Dogs: 5 mg/kg, PO, q12h Cats: 8.8 mg/kg PO q24h or 50 mg/cat PO q24h	Similar to doxycycline and can be used for dogs or cats with URI, CIRDC, or bronchitis that is likely to be associated with <i>B. bronchiseptica</i> , <i>Mycoplasma</i> spp., and <i>C. felis</i> (cats)
Orbifloxacin	2.5–7.5 mg/kg PO q12h for tablets 7.5 mg/kg, PO, q12h for the oral suspension in cats	See Marbofloxacin comments. The oral suspension is well tolerated by cats
Ormetoprim-sulfadimethoxine	27.5 mg/kg, PO q24h in dogs Note: dosing is based on total sulfadimethoxine-ormetoprim concentration (5 to 1 ratio)	See comments on trimethoprim–sulfonamide-containing products
Pradofloxacin	5.0 mg/kg PO q24h if tablets are used in dogs or cats 7.5 mg/kg PO q24h if oral suspension for cats is used	Effective for the primary bacterial pathogens <i>B. bronchiseptica</i> , <i>Mycoplasma</i> spp., and <i>C. felis</i> (cats) as well as many secondary infections with Gram-negative and Gram-positive organisms. In contrast to other veterinary fluoroquinolones, pradofloxacin has activity against some anaerobic bacteria. The drug is labeled in some countries for the treatment of acute infections of the upper respiratory tract of cats caused by susceptible strains of <i>Pasteurella multocida</i> , <i>Escherichia coli</i> and the <i>S. intermedius</i> group (including <i>S. pseudintermedius</i>). The use of pradofloxacin in dogs has been associated with myelosuppression and is extra-label in North America

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Table 2 (Continued)

Drug	Dose	Comments
Piperacillin-tazobactam	50 mg/kg IV q6h for immunocompetent animals, or 3.2 mg/kg/h CRI, after loading dose of 3 mg/kg IV, for other animals	Antipseudomonal penicillin. Used for life-threatening pneumonia or pyothorax for the treatment of Gram-negative (including some ESBL), Gram-positive and anaerobic bacteria. Ineffective for <i>Mycoplasma</i> , <i>T. gondii</i> , and <i>N. caninum</i>
Trimethoprim-sulfamethoxazole, trimethoprim-sulfadiazine	15 mg/kg PO q12h Note: dosing is based on total trimethoprim + sulfadiazine concentration	Generally avoided in respiratory tract infections that might involve anaerobic bacteria (particularly pyothorax). Might be less effective than other first-line choices for some primary bacterial pathogens other than <i>Streptococcus</i> spp. Concerns regarding adverse effects exist (KCS, folate deficiency anemia, blood dyscrasias) in some dogs, especially with prolonged treatment. If prolonged (>7 day) treatment is anticipated, baseline Schirmer's tear testing is recommended, with periodic re-evaluation and owner monitoring for ocular discharge. Avoid in dogs that might be sensitive to potential adverse effects such as KCS, hepatopathy, hypersensitivity, and skin eruptions, and owners of treated dogs should be informed of the clinical findings to be monitored.