

Table 27.2. Antimicrobial drug selection in infection of horses.

Site	Diagnosis	Common Infecting Organism(s)	Comments	Suggested Drug(s)	Alternative Drug(s)
Upper Respiratory Tract	Strangles	<i>Streptococcus equi</i>	Treatment of a horse with strangles depends on the stage of the disease. While the organism is susceptible to penicillin, parenteral antibiotics given after abscess formation may prolong the disease. Horses with severe systemic signs or internal abscesses require antibiotics.	Penicillin G ^a	Ceftiofur
	Guttural pouch empyema	<i>Streptococcus equi</i> , <i>S. zooepidemicus</i> , rarely Gram-negatives	Local irrigation with saline is the treatment of choice. Lowering the horse's head facilitates drainage and reduces the risks of aspiration. Systemic or topical antimicrobials rarely indicated unless infection is spreading.	Penicillin G ^a	Ceftiofur
	Guttural pouch mycosis	<i>Emicella nidulans</i> , <i>A. fumigatus</i> , other opportunistic fungi	Surgical occlusion of the affected artery is the treatment of choice. Even when successful, medical therapy may be too slow to prevent several bouts of hemorrhage.	Topical enilconazole; Systemic antifungal agents usually not required	Topical natamycin
	Fungal rhinitis	<i>Aspergillus</i> spp. Other opportunistic fungi	Surgical removal of the mycotic plaque and associated necrotic tissue, combined with topical antifungal therapy.	Topical enilconazole	Topical natamycin; Topical amphotericin B
	Sinusitis, primary	<i>S. zooepidemicus</i>	Treatment may consist of a daily lavage of sinus with saline (± antiseptics or antimicrobial agents) combined with systemic antimicrobial agents. Non-responsive cases may require sinusotomy. Usually requires treatment of primary problem; i.e., removal of diseased tooth.	Penicillin G ^a	Ceftiofur; trimethoprim-sulfonamide ^b
Lung	Sinusitis, secondary	Mixed opportunistic aerobic ^c and anaerobic ^d infection		Penicillin G ^a	Ceftiofur; trimethoprim-sulfonamide ^b and metronidazole; chloramphenicol
	Bacterial pneumonia or lung abscesses; adults	<i>S. zooepidemicus</i> , Opportunistic aerobic pathogens ^c , <i>S. pneumoniae</i> , <i>Mycoplasma</i> spp. <i>S. zooepidemicus</i>	<i>S. zooepidemicus</i> is most commonly isolated.	Ceftiofur; penicillin G ^a is drug of choice if streptococcal infection is confirmed	Broad-spectrum antibiotics ^e , trimethoprim-sulfonamide ^b
	Bacterial pneumonia or lung abscesses Older foals	Opportunistic aerobic <i>R. equi</i>	Most common cause of pneumonia/bronchitis in older foals. Treatment must be a minimum of 3–4 weeks.	Oxytetracycline Penicillin G Ceftiofur Rifampin and macrolide (erythromycin, azithromycin, or clarithromycin).	Enrofloxacin ^f ; chloramphenicol Ceftiofur; macrolide ± rifampin for refractory abscesses Broad-spectrum antibiotics ^e Doxycycline ^h rifampin; trimethoprim-sulfonamide rifampin (continued)

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		<i>Pneumocystis jiroveci</i>	May be found in immunocompromised foals or in association with <i>R. equi</i> .	Trimethoprim-sulfonamide	
	Bacterial pneumonia; neonatal foals	Opportunistic aerobic pathogens ^c	Neonatal pneumonia often a part of a generalized infection affecting many different organ systems.	Broad-spectrum antibiotics ^e (amikacin preferred over gentamicin)	Third-generation cephalosporins; ticarcillin-clavulanic acid
	Pleuropneumonia	Opportunistic aerobic and anaerobic pathogens ^d	While systemic antimicrobial agents are most essential treatment for bacterial pleuropneumonia, thoracic drainage and nursing care are important.	Broad-spectrum antibiotics ^e ± metronidazole	Ceftiofur ± metronidazole; penicillin ^g and enrofloxacin ^f ± metronidazole; trimethoprim sulfonamide ^e and metronidazole
	Fungal pneumonia	<i>Mycoplasma felis</i> Opportunistic fungi: <i>Aspergillus</i> spp., <i>Candida</i> spp., <i>Mucor</i> spp.	If fungal pneumonia is secondary to severe primary disease (i.e., liver failure, enterocolitis, peritonitis, etc.), treatment is difficult and prognosis is poor. If fungal pneumonia is secondary to aggressive antibiotic therapy (i.e., neonatal foal) then prognosis is guarded. Treatment is not usually attempted. Public health concern. Reportable disease.	Oxytetracycline Amphotericin B	Enrofloxacin ^f ; chloramphenicol Itraconazole; voriconazole
	Tuberculosis	<i>Mycobacterium</i>		See chap. 24	
Gastrointestinal	Oral, gastric candidiasis	<i>Candida</i> spp.	Seen in immunosuppressed animals or ones on long-term antibiotic therapy. May just require discontinuation of antibiotic therapy.	Fluconazole	Voriconazole; itraconazole; Amphotericin B
	Acute enterocolitis; salmonellosis	<i>S. typhimurium</i> , other serovars	Systemic antimicrobials indicated in animals showing signs of or at risk for septicemia (foals, immunocompromised animals, aged animals, aged animals). Treatment with antibiotic is not thought to alter the course of the disease.	Broad-spectrum antibiotics ^e ; enrofloxacin ^f	Third-generation cephalosporins; susceptibility variable
	Acute enterocolitis; clostridiosis	<i>C. difficile</i> , <i>C. perfringens</i> type A, <i>C. perfringens</i> type C	The first approach in therapy is to stop the precipitating antimicrobial agent when applicable.	Metronidazole	Oral bacitracin (22 mg/kg PO BID day 1, then SID); oral vancomycin ^g
	Potomac horse fever (equine ehrlichial colitis)	<i>Neorickettsia risticii</i>		Oxytetracycline	Oral doxycycline; ^h rifampin and erythromycin
	Proliferative enteropathy	<i>Lawsonia intracellularis</i>	Proliferative ileitis and diarrhea in foals.	Macrolide ± rifampin	Oxytetracycline; chloramphenicol
	Abdominal abscess	<i>S. equi</i> , <i>S. zooepidemicus</i> , <i>Corynebacterium pseudotuberculosis</i>	Most commonly a complication of strangles. Long-term treatment frequently required.	Penicillin G ⁱ ± rifampin	Macrolide ± rifampin; chloramphenicol; trimethoprim-sulfonamide ^b

	<i>R. equi</i> (foals)	Abdominal abscess(es) and ulcerative enterocolitis. Peritonitis may be present. Pneumonia, diarrhea, septic phyltitis, or arthritis may occur concurrently.	Rifampin and macrolide (erythromycin, clarithromycin, or azithromycin)	Doxycycline ^b ± rifampin; Trimethoprim-sulfonamide. Rifampin
Peritonitis	Mixed opportunistic aerobic ^c and anaerobic pathogens ^d <i>Actinobacillus equuli</i> <i>Clostridium piliforme</i>	Obtaining culture and sensitivity of peritoneal fluid highly recommended. Peritoneal lavage may be beneficial in some cases. Treatment is usually not successful.	Broad-spectrum antibiotics ^e and metronidazole	Third- or fourth-generation cephalosporine and metronidazole; penicillin G ^a + enrofloxacin ^f + metronidazole Oxytetracycline
Tyzer's disease			Erythromycin ± rifampin; penicillin G and aminoglycoside	
Liver abscess	β-hemolytic Streptococci, <i>C. pseudotuberculosis</i> , opportunistic aerobic ^c or anaerobic ^d pathogens	Ultrasonography may be helpful in diagnosis. May occur concurrently with other abdominal abscess(es). Long-term treatment required.	Penicillin ^g and enrofloxacin ^f ± metronidazole	Broad-spectrum antibiotics ^e ± metronidazole
Cholangiohepatitis	Gram-negative enteric organisms	May be difficult to identify the offending organism(s). Long-term therapy required. Prognosis is poor when several obstructing calculi are present. For obstructing stones, cholecholelitomy may be indicated.	Trimethoprim-sulfonamide	Ceftiofur, enrofloxacin ^f
Candidiasis	<i>Candida</i> spp.	Infection of multiple systems may occur. Fungemia, although uncommon, has been seen in immunocompromised foals on aggressive, broad-spectrum antibiotic therapy.	Fluconazole	Voriconazole; itraconazole; amphotericin B
Bacterial septicemia	<i>E. coli</i> , opportunistic aerobic ^c pathogens (mostly Gram-negatives)	Neonate is most commonly affected. Parenteral administration of antibiotics recommended, at least initially. Treatment required for a minimum of at least 2 weeks.	Broad-spectrum antibiotics ^e (amikacin preferred over gentamicin)	Third- or fourth-generation cephalosporins; ticarcillin-clavulanic acid
Omphalophlebitis	Opportunistic aerobic ^c pathogens	Ultrasonography is useful when external signs of infection are not apparent. Surgical resection may be the treatment of choice in some cases.	Broad-spectrum antibiotic ^e (amikacin preferred over gentamicin)	Third- or fourth-generation cephalosporins; ticarcillin-clavulanic acid
Fistulous withers	<i>Brucella abortus</i> , <i>Actinomyces bovis</i>	Public health concern with brucellosis. Treatment regimen using killed <i>Brucella</i> vaccine may be effective.	Oxytetracycline and streptomycin or gentamicin	Oral doxycycline ^b or trimethoprim-sulfonamide and gentamicin or rifampin
Traumatic and contaminated wounds	Opportunistic aerobic ^c and anaerobic ^d pathogens	Exploration, lavage, debridement, and local therapy are more important than systemic antimicrobial agents.	Broad-spectrum antibiotics ^e	Ceftiofur; trimethoprim-sulfonamide

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Site	Diagnosis	Common Infecting Organism(s)	Comments	Suggested Drug(s)	Alternative Drug(s)
Ulcerative lymphangitis		<i>C. pseudotuberculosis</i>	Drainage of <i>C. pseudotuberculosis</i> subcutaneous abscesses is preferred over antibiotic therapy. Systemic antibiotics required for ulcerative lymphangitis, internal abscesses, or in horses with signs of systemic illness.	Penicillin G ^a	Trimethoprim-sulfonamide; erythromycin ± rifampin; chloramphenicol
Subcutaneous abscesses		β-hemolytic <i>Streptococcus</i> spp.	Drainage of abscesses preferred over antibiotic therapy. Systemic antibiotics required for internal abscesses or in horses with signs of systemic illness.	Penicillin G ^a	Ceftiofur, chloramphenicol
Burns		<i>P. aeruginosa</i> , <i>S. aureus</i> ; other opportunistic aerobic ^c pathogens	Care of burn wounds includes thorough cleansing, surgical debridement, daily hydrotherapy, and topical antimicrobials. Systemic antibiotics are not effective in preventing local burn wound infections and may permit the growth of resistant bacteria. Systemic antibiotics only if signs of systemic infection.	Topical: silver sulfadiazine cream. Systemic: broad-spectrum antibiotics ^c	Ticarcillin-clavulanic acid; third-generation cephalosporins
Bone and Joint	<i>Clostridium</i> myonecrosis Osteomyelitis; septic arthritis neonates	<i>C. perfringens</i> , <i>C. septicum</i> , <i>C. chauvoei</i> , other spp. Opportunistic aerobic ^c pathogens <i>Salmonella</i> spp. <i>R. equi</i>	Surgical debridement, including fasciotomy, and supportive care are essential. Poor prognosis. In foals, osteomyelitis and septic arthritis are seen secondary to septicemia. Antibiotics and surgical debridement are required for osteomyelitis. Antibiotics and joint lavage are required for septic arthritis. Intra-articular antibiotics as well as IV regional or intraosseous perfusion with antimicrobial may be beneficial.	Penicillin G (IV) + metronidazole	Tetracycline; chloramphenicol Broad-spectrum antibiotics ^c Third- or fourth-generation cephalosporins; (amikacin preferred over gentamicin); see above for <i>R. equi</i>
Osteomyelitis adults		Opportunistic aerobic ^c pathogens	Usually secondary to traumatic and contaminated wounds. Antibiotics and surgical debridement are required.	Broad-spectrum antibiotics ^c	Third- or fourth-generation cephalosporins; trimethoprim-sulfa
Septic arthritis or tenosynovitis sulfonamide adults		<i>Staphylococcus</i> spp. Opportunistic aerobic ^c pathogens	In adults, septic arthritis is usually associated with intra-articular injection or wounds. Joint/tendon sheath drainage and lavage are highly recommended. Intra-articular antibiotics as well as regional IV or intraosseous perfusion with antimicrobials may be beneficial. <i>In vitro</i> susceptibility testing highly recommended.	First-generation cephalosporin and amikacin or gentamicin	Broad-spectrum antibiotics ^c ; trimethoprim-sulfonamide
Lyme disease		<i>Borrelia burgdorferi</i>	Definitive diagnosis is difficult; presence of serum antibody does not indicate disease.		Oxytetracycline; Oral doxycycline; ^b ceftriaxone; ceftiofur

Skin	Dermatophilosis Ampicillin (streptothricosis, rain rot)	<i>D. congolensis</i>	Systemic therapy often unnecessary and generally reserved for severe or generalized cases. Infected animals should be groomed and bathed daily with povidone-iodine shampoo or chlorhexidine solution (Novaslan 2%). If treated systemically a short course of antibiotics is often effective (3–5 days)	Procaine penicillin G	
	Folliculitis/furunculosis	<i>Staphylococcus</i> spp., <i>Streptococcus</i> spp., <i>C. pseudotuberculosis</i>	Same as dermatophilosis. Antibiotics, if required, should be based on culture/ sensitivity.	Broad-spectrum antibiotics ^e	Trimethoprim-sulfonamide
	Staphylococcal cellulitis	<i>S. aureus</i> , <i>S. intermedius</i>	Requires aggressive systemic antibiotics	First-generation cephalosporin and gentamicin or amikacin (amikacin preferred)	Broad-spectrum antibiotics; ^e trimethoprim-sulfonamide; chloramphenicol
	Dermatophytosis	<i>Trychothyton equinum</i> , <i>T. mentagrophytes</i> , <i>Microsporum gypsum</i> , <i>M. equinum</i> , etc.	Disease may spontaneously regress but therapy shortens the recovery period and may decrease the spread of the disease. Topical therapy is sufficient. Treat the whole body of all contact animals.	5% lime sulfur or 0.5% sodium hypochloride solution or povidone-iodine topically daily for 3–5 days and reapply weekly until resolution of infection	Topical natamycin; topical enilconazole; topical miconazole
	Sporotrichosis	<i>Sporothrix schenckii</i>	Treatment is often effective. Continue treatment for several weeks after lesions disappear or relapse will occur. Systemic iodides may cause abortion in pregnant mares.	Itraconazole and sodium iodide: 40 mg/kg of 20% solution IV for 2–5 days followed by oral potassium iodide: 2 mg/kg SID PO until lesions regress	Amphotericin B; fluconazole
Renal	Pythiosis (phycomycosis, swamp cancer, Florida horse leech, bursattii, gulf coast fungus)	<i>Pythium insidiosum</i>	Immediate radical surgical removal of all infected tissues is essential for effective treatment. Early immunotherapy with soluble <i>Pythium</i> antigens is effective, especially when combined to surgical removal.	Intralesional amphotericin B; amphotericin B (distal limb) systemic iodides (see sporotrichosis)	Topical or intralesional miconazole; systemic fluconazole
	Cystitis	Opportunistic aerobic ^c bacteria, <i>Candida</i> spp.	Cystitis is usually secondary to urolithiasis, bladder neoplasia, or bladder paralysis. Treat for 7–10 days and reculture urine.	Trimethoprim-sulfonamide; fluconazole for <i>Candida</i> spp.	Ceftiofur; broad-spectrum antibiotics ^e
	Pyelonephritis	Opportunistic aerobic ^c bacteria	Same predisposing factors as cystitis Usually chronic and insidious, may be difficult to treat. Use aminoglycosides cautiously in face of renal disease. Treat a minimum of 2–3 weeks; duration required is variable and may be longer.	Trimethoprim-sulfonamide; third-generation cephalosporin	Penicillin G and enrofloxacin ^f
Cardiovascular	Bacterial endocarditis	<i>Streptococcus</i> spp., opportunistic aerobic ^c pathogens	Prognosis is poor to grave. Long-term treatment is required (several months). Antibiotic choice should be based on blood culture.	Broad-spectrum antibiotics ^e ± rifampin	Third- or fourth-generation cephalosporin; penicillin G and enrofloxacin ^f
	Bacterial pericarditis	<i>Streptococcus</i> spp., mixed opportunistic aerobic ^c and anaerobic ^d pathogens	Prognosis is guarded. Culture of peri- fluid is recommended. Drainage and lavage of the pericardial sac are also recommended.	Broad-spectrum antibiotics ^e	Third- or fourth-generation cephalosporin; penicillin G and enrofloxacin ^f

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Site	Diagnosis	Common Infecting Organism(s)	Comments	Suggested Drug(s)	Alternative Drug(s)
Nervous	Thrombophlebitis	Mixed opportunistic aerobic and anaerobic pathogens	Blood culture recommended.	Broad-spectrum antibiotics ^a ± metronidazole	Ceftiofur; trimethoprim-sulfonamide ^b
	Bacterial meningitis or spinal abscess	Opportunistic aerobic ^c pathogens	Most often associated with neonatal septicemia. Prognosis is poor.	Third- or fourth-generation cephalosporin ⁱ ± aminoglycoside (amikacin preferred)	Broad-spectrum antibiotics penicillin G and enrofloxacin; trimethoprim-sulfonamide ^e
	Mycotic meningitis/encephalitis	<i>Cryptococcus neoformans</i>	Prognosis is grave.	Fluconazole	Amphotericin B
	Brain abscess	<i>Aspergillus</i> spp. <i>Streptococcus equi</i> , <i>Streptococcus</i> spp.	Prognosis is grave. Prognosis grave.	Amphotericin B Penicillin G ^a ± rifampin	Itraconazole; voriconazole Third-generation cephalosporin ⁱ
	Tetanus	<i>Clostridium tetani</i>	Antibiotics to eliminate the infection but tetanus antitoxin to neutralize the unbound toxin.	Penicillin G ^a	Ampicillin
	Botulism	<i>Clostridium botulinum</i>	Antitoxin to neutralize unbound toxin. Antibiotics if suspected wound contamination or to prevent complications such as aspiration pneumonia.	Penicillin G ^a	Ampicillin
	Otitis media/interna	<i>Actinobacillus</i> spp., <i>Staphylococcus</i> spp., <i>Streptococcus</i> spp., opportunistic aerobic ^c pathogens	Cause vestibulocochlear and/or facial nerve dysfunction as well as head shaking.	Trimethoprim-sulfonamide	Chloramphenicol; third-generation cephalosporin
Ophthalmic	Equine protozoal myeloencephalitis	<i>Sarcocystis neurona</i>	Treatment may stop progression of disease and occasionally reverse clinical signs. Long-term therapy required.	Ponazuril; diclazuril	Sulfadiazine (24 mg/kg PO SID) and pyrimethamine (1 mg/kg PO SID)
	Bacterial keratitis; Mild corneal ulceration	Gram-negative or Gram-positive opportunistic bacteria	Topical application.	Topical bacitracin-neomycin-polymyxin B combinations	Topical gentamicin; topical ofloxacin
	Bacterial keratitis; severe melting keratitis	<i>P. aeruginosa</i>	Topical (or subconjunctival when appropriate) application (see chap. 22).	Topical tobramycin; topical ofloxacin	Topical ciprofloxacin
	Fungal keratitis	<i>Aspergillus</i> spp. <i>Alternaria</i> spp., <i>Mucor</i> spp., <i>Fusarium</i> spp., <i>Candida</i> spp.	Topical application.	Natamycin; voriconazole	Miconazole; itraconazole- DMSO ointment
Foreign body penetration	Gram-negative or Gram-positive bacteria, fungal agents	Topical broad-spectrum coverage Systemic antimicrobials indicated if anterior chamber penetrated and/or if peri-orbital tissues are infected.	Topical gentamicin; systemic broad-spectrum antibiotics ^e	Topical tobramycin; systemic trimethoprim-sulfonamide; penicillin G and enrofloxacin ^f	
Manifestation of systemic disease	Bacterial: <i>A. equuli</i> , leptospirosis, <i>R. equi</i> Fungal: <i>Crypto-coccus</i> spp., <i>Histoplasma</i> spp., <i>Aspergillus</i> spp.	Ocular signs may be immune mediated. Primary treatment is aimed at systemic disease. Often associated with optic neuritis, chorioretinitis, anterior uveitis, blepharitis, purulent conjunctivitis.	See specific infection See specific infection	See specific infection	

Reproductive Tract	Retained placenta	<i>S. zooepidemicus</i> , coliforms	Bacterial infections are commonly associated with prolonged (> 6–8h) retention of membranes. Systemic antimicrobials recommended if early treatment with oxytocin fails.	Broad-spectrum antibiotics ^e	Trimethoprim-sulfonamide; third-generation cephalosporin
	Endometritis, metritis, and pyometra	<i>S. zooepidemicus</i> , <i>E. coli</i> , <i>P. aeruginosa</i>	Control of pneumovagina (Caslick's) is indicated in most cases. Urovagina and peritoneal lacerations also predispose to infection. Antiseptics used by the intrauterine route may induce a chemical irritation. Uterine lavage and hormonal therapy (e.g., oxytocin, PGF ₂) are adjunct treatments. Systemic antibiotics are indicated primarily when endometrial biopsy suggests a deep endometrial infection or in cases of septic metritis with systemic clinical signs. Therapy based on <i>in vitro</i> susceptibility testing.	Choice of agent based on culture and sensitivity.	
	Fungal endometritis	<i>Candida</i> spp., <i>Aspergillus</i> spp.	Systemic antifungal agents are usually not warranted.	Intrauterine: clotrimazole (cream or suspension 500 mg daily for 7 days) Trimethoprim-sulfonamide	Intrauterine: nystatin (500,000 IU); amphotericin B (50–100mg) Broad-spectrum antibiotics ^e
	Placentitis	Highly variable. <i>S. zooepidemicus</i> , <i>E. coli</i> , <i>Klebsiella</i> spp. are most common	Culture and sensitivity of discharge is highly recommended as organism(s) involved is unpredictable. It may be difficult to obtain effective antibiotic levels at the site of infection and resolution of the infection may not be possible until after parturition.		
	Contagious equine metritis	<i>Taylorella equigenitalis</i>	Mares may become carriers once infected. Stallions are asymptomatic carriers. Reportable disease.	Mares: intrauterine potassium penicillin, cleansing of vulva and clitoral fossa with 4% chlorhexidine solution followed with packing of the clitoral fossa with chlorhexidine or nitrofurazone ointment. Stallions: potassium penicillin G2000 IU/ml of semen extender. Wash penis daily with chlorhexidine solution and pack with nitrofurazone ointment	
	Mastitis	<i>S. zooepidemicus</i> , <i>Staphylococcus</i> spp., other opportunistic aerobic pathogens, <i>Mycoplasma</i> spp.	Systemic antimicrobial therapy is recommended. Intramammary preparations for cows may also be used.	Trimethoprim-sulfonamide ^b ; oxytetracycline for <i>Mycoplasma</i> spp.	Broad-spectrum antibiotics ^e

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	Balanoposthitis	<i>S. zooepidemicus</i> , <i>Pseudomonas</i> spp., <i>Klebsiella</i> spp.	Bacterial balanoposthitis as a clinical problem is uncommon. Antimicrobial therapy is directed at infected semen or the recipient mare through the use of antimicrobials in semen extender. Washing of immediately prior to natural service. Washing of penis and prepuce with a mild soap is recommended. Disinfectant or topical antibiotics should not be used routinely as recolonization may occur and this treatment may displace commensals and allow pathogens to become established.	Potassium penicillin G 1000 IU and amikacin 1000 g per ml of semen extender	Ticarcillin 1000 g per ml of semen extender
	Seminal vesiculitis	<i>P. aeruginosa</i> , <i>K. pneumoniae</i> , <i>Streptococcus</i> spp., <i>Staphylococcus</i> spp.	Systemic antibiotics based on <i>in vitro</i> susceptibility testing. Antibiotics can also be deposited in the seminal vesicle using a flexible endoscope. If infection cannot be eradicated, appropriate semen extender must be used for breeding (see recommendations for balanoposthitis).	Broad-spectrum antibiotics ^a	Ticarcillin-clavulanic acid; penicillin G ^a and ciprofloxacin ^f or enrofloxacin ^f
	Orchitis, epididymitis	<i>S. zooepidemicus</i> , <i>K. pneumoniae</i>	<i>In vitro</i> susceptibility testing is recommended.	Broad-spectrum antibiotics ^a	Third-generation cephalosporins; trimethoprim-sulfonamide ^b
Systemic Diseases	Leptospirosis serovar <i>bratislava</i> , <i>pomona</i> , and others	<i>L. interrogans</i>	Uveitis, nephritis, abortions, pyrexia, liver dysfunction.	Oxytetracycline	Ampicillin; doxycycline; penicillin
	Equine ehrlichiosis	<i>Anaplasma phagocytophilum</i>	Fever, limb edema, petechiation, ataxia, anemia, leukopenia, thrombocytopenia.	Oxytetracycline	Oral doxycycline ^b
	Systemic mycosis	<i>Histoplasma capsulatum</i> , <i>Blastomyces dermatidis</i>		Itraconazole	Histoplasma
		<i>Coccidioides immitis</i>		Fluconazole	Fluconazole Itraconazole

^aPenicillin G (potassium, sodium, or procaine).

^bTrimethoprim-sulfonamide may not be effective against streptococci *in vivo*, regardless of *in vitro* susceptibility results.

^fIncludes *Actinobacillus* spp., *Enterobacter* spp., *E. coli*, *Klebsiella* spp., *Pasteurella* spp., *Pseudomonas aeruginosa*, *Proteus* spp., *Staphylococcus aureus*, *S. zooepidemicus*.
^gIncludes *Bacteroides* spp., *Clostridium* spp., *Fusobacterium* spp., *Peptostreptococcus* spp., and others.

^cCombination of a beta-lactam (penicillin G, ampicillin, or a first-generation cephalosporin) and an aminoglycoside (gentamicin or amikacin).

^dShould not be used in young growing horses because of the risk of arthropathy.

^eThe use of vancomycin should be restricted for severely ill cases with confirmed *Clostridium* spp. infection with documented resistance to conventional antimicrobials.

^fAdminister orally only. Intravenous doxycycline has resulted in severe cardiovascular effects including collapse and death in some horses.

^gPan American Veterinary Labs (www.pavlab.com), Hutto, Texas.

^hAs opposed to most other third-generation cephalosporins, ceftiofur does not cross the normal blood-brain barrier.