

Organism	Clinical Features	Treatment
<b>Aerobic and Facultatively Anaerobic Gram-Positive Cocci</b>		
<i>Enterococcus faecalis</i> and <i>faecium</i>	Bacteremia, intraabdominal abscess, urinary tract infection, endocarditis	Penicillin/ampicillin/piperacillin or vancomycin; combined with gentamicin for endocarditis or severe infection
<i>Staphylococcus aureus</i>	Cutaneous infections: impetigo, folliculitis, furuncles, carbuncles, wound; disseminated infections: pneumonia, empyema, osteomyelitis, septic arthritis; toxin-mediated infections: toxic shock syndrome, scalded skin syndrome, food poisoning	Nafcillin; vancomycin (for methicillin-resistant strains)
<i>Staphylococcus</i> , coagulase negative	Opportunistic pathogen causing infections on foreign bodies (e.g., catheters, shunts, prosthetic joints and heart valves); urinary tract infections (e.g., <i>S. saprophyticus</i> )	Nafcillin; vancomycin (for methicillin-resistant strains)
<i>Streptococcus pyogenes</i> (group A)	Suppurative infections: pharyngitis, scarlet fever, sinusitis, skin and soft-tissue infection (impetigo, erysipelas, cellulitis, necrotizing fasciitis), toxic shock-like syndrome; nonsuppurative infections: rheumatic fever; glomerulonephritis	Penicillin, macrolides, cephalosporins, clindamycin, vancomycin; surgical débridement for necrotizing fasciitis
<i>Streptococcus agalactiae</i> (group B)	Neonatal disease (early onset, late onset; bacteremia, pneumonia, meningitis); urinary tract infections, bacteremia, pneumonia	Penicillin, macrolides, cephalosporins, clindamycin, vancomycin; penicillin and aminoglycoside for serious infections
Other B-hemolytic streptococci	Pharyngitis, otitis, sinusitis, skin and soft-tissue infection, impetigo, erysipelas, cellulitis, necrotizing fasciitis	Penicillin (drug of choice), macrolides, cephalosporins, clindamycin, vancomycin; surgical débridement for necrotizing fasciitis
<i>Streptococcus bovis</i>	Bacteremia, endocarditis	Penicillin
Viridans streptococci	Abscess formation; septicemia in neutropenic patients; subacute endocarditis; odontogenic infections; dental caries	Penicillin; penicillin combined with aminoglycoside
<i>Streptococcus pneumoniae</i>	Pneumonia and other respiratory tract infections; meningitis; spontaneous bacterial peritonitis, endocarditis, septic arthritis; bacteremia	Penicillin; levofloxacin, cephalosporins, clindamycin
<b>Aerobic or Facultatively Anaerobic Gram-Positive Rods</b>		
<i>Bacillus anthracis</i>	Cutaneous anthrax, inhalation anthrax, gastrointestinal anthrax	Fluoroquinolones (ciprofloxacin); penicillin, doxycycline, erythromycin, or chloramphenicol as alternative therapy
<i>Bacillus cereus</i>	Gastroenteritis, ocular infections, bacteremia	Fluoroquinolones, vancomycin
<i>Corynebacterium diphtheriae</i>	Diphtheria: respiratory, cutaneous	Neutralizing exotoxin; penicillin or erythromycin to eliminate organism and terminate toxin production; immunization with diphtheria toxoid
<i>Corynebacterium jeikeium</i>	Septicemia, endocarditis; wound infections; foreign body infections	Vancomycin
<i>Corynebacterium urealyticum</i>	Urinary tract infections, including pyelonephritis with calculi; septicemia; endocarditis; wound infections	Vancomycin
<i>Erysipelothrix rhusiopathiae</i>	Erysipeloid (painful, pruritic inflammatory skin lesion)	Penicillin; cephalosporins, fluoroquinolones, erythromycin, or clindamycin as alternative therapy
<i>Listeria monocytogenes</i>	Early onset neonatal disease (granulomatosis infantiseptica); late-onset neonatal disease (meningitis with septicemia); flulike illness in adults; bacteremia or disseminated disease in pregnant women or patients with cell-mediated immune defects	Ampicillin (alone or in combination with gentamicin)
<b>Mycobacteria</b>		
<i>Mycobacterium avium</i> complex	Localize pulmonary disease; disseminated disease with multiorgan involvement	Clarithromycin or azithromycin combined with rifabutin or ethambutol
<i>Mycobacterium leprae</i>	Leprosy: range from tuberculoid form to lepromatous form	Dapsone and rifampicin for tuberculoid form; add clofazimine for lepromatous form

<i>Mycobacterium tuberculosis</i>	Tuberculosis: pulmonary, extrapulmonary	Multidrug therapy with isoniazid, rifampin, ethambutol, and pyrazinamide
<i>Nocardia</i> species	Bronchopulmonary disease; primary or secondary cutaneous infections; brain abscesses	Sulfonamides; amikacin, carbapenems, or broad-spectrum cephalosporins as alternative therapy if active
<i>Rhodococcus equi</i>	Bronchopulmonary disease (lung abscesses); opportunistic infections in immunocompetent patients	Combination therapy with vancomycin, carbapenems, aminoglycosides, ciprofloxacin, rifampin, and/or erythromycin
<b>Aerobic Gram-Negative Cocci</b>		
<i>Neisseria gonorrhoeae</i>	Gonorrhoea, pelvic inflammatory disease, arthritis	Ceftriaxone, ciprofloxacin; cefoxitin plus doxycycline
<i>Neisseria meningitidis</i>	Meningitis, bacteremia (meningococcemia)	Ceftriaxone, penicillin, chloramphenicol
<i>Acinetobacter</i>	Pneumonia, septicemia, opportunistic infections	Imipenem or ceftazidime combined with aminoglycoside for serious infections
<i>Aeromonas</i>	Wound infections; gastroenteritis	Ciprofloxacin; trimethoprim-sulfamethoxazole, gentamicin, or amikacin as alternative therapy
<i>Bartonella henselae</i>	Bacillary angiomatosis; subacute endocarditis; cat scratch disease (CSD)	Gentamicin alone or with erythromycin; broad-spectrum cephalosporins used as alternative therapy; CSD does not response to antibiotic therapy
<i>Bartonella quintana</i>	Trench fever (TF); bacillary angiomatosis (BA)	As with <i>B. henselae</i>
<i>Bordetella pertussis</i> , <i>Bordetella parapertussis</i>	Pertussis (whooping cough)	Supportive therapy, erythromycin (or other macrolides) to decrease infectivity and prophylaxis for contacts
<i>Brucella</i>	Brucellosis	Doxycycline plus rifampin or gentamicin; trimethoprim-sulfamethoxazole
<i>Burkholderia cepacia</i> complex	Pulmonary infections; opportunistic infections	Trimethoprim-sulfamethoxazole; piperacillin, ceftazidime, or ciprofloxacin as alternative therapy if trimethoprim-sulfamethoxazole resistant
<i>Burkholderia pseudomallei</i>	Melioidosis (asymptomatic to severe pulmonary disease)	Trimethoprim-sulfamethoxazole combined with ceftazidime
<i>Campylobacter jejuni</i> , <i>Campylobacter coli</i> , <i>Campylobacter upsaliensis</i>	Gastroenteritis	Self-limited; severe infections treated with erythromycin; tetracycline or fluoroquinolones used as alternative therapy
<i>Campylobacter fetus</i>	Septicemia; meningitis; gastroenteritis; spontaneous abortion	Aminoglycosides, carbapenems, chloramphenicol
<i>Cardiobacterium hominis</i>	Subacute endocarditis	Penicillin or ampicillin
<i>Eikenella corrodens</i>	Subacute endocarditis; wound infections	Penicillin, cephalosporins, tetracycline, or fluoroquinolones
<i>Escherichia coli</i> -enteropathogenic (EPEC)	Watery diarrhea and vomiting	Unknown
<i>E. coli</i> -enterohemorrhagic (EHEC)	Watery diarrhea, hemorrhagic colitis, hemolytic uremic syndrome	Antibiotics contraindicated
<i>E. coli</i> -enterotoxigenic (ETEC)	Watery diarrhea	Ciprofloxacin shortens course (high level of resistance)
<i>E. coli</i> -enteroaggregative (EAEC)	Diarrhea with mucus	Fluoroquinolones in AIDS patients
<i>E. coli</i> -enteroinvasive (EIEC)	Watery diarrhea, hemorrhagic colitis	Antibiotics reduce duration of disease and infectivity
<i>E. coli</i> -uropathogenic	Cystitis, pyelonephritis	Trimethoprim-sulfamethoxazole, fluoroquinolones

<i>E. coli</i> -meningitis associated	Acute meningitis	Extended-spectrum cephalosporins
<i>Francisella tularensis</i>	Tularemia: ulceroglandular, oculoglandular, pneumonic	Streptomycin, gentamicin; fluoroquinolones
<i>Haemophilus influenzae</i>	Encapsulated type b strains: meningitis, septicemia, cellulitis, epiglottitis; unencapsulated strains: otitis media, sinusitis, bronchitis, pneumonia	Broad-spectrum cephalosporin, azithromycin, or fluoroquinolone; many strains resistant to ampicillin
<i>Helicobacter pylori</i>	Gastritis, peptic, and duodenal ulcers; gastric adenocarcinoma	Multidrug therapy: tetracycline, metronidazole, bismuth, and omeprazole
<i>Kingella kingae</i>	Subacute endocarditis	B-Lactam with B-lactamase inhibitor, cephalosporins, macrolides, tetracycline, fluoroquinolones
<i>Klebsiella pneumoniae</i>	Pneumonia, urinary tract infections	Cephalosporins, fluoroquinolones
<i>Legionella pneumophila</i>	Legionnaires' disease (pneumonia), Pontiac fever (flulike illness)	Macrolides (erythromycin, azithromycin, clarithromycin); fluoroquinolones (ciprofloxacin, levofloxacin) used as alternative therapy
<i>Moraxella catarrhalis</i>	Ear, eye, and respiratory infections	Cephalosporins; amoxicillin/clavulanic acid
<i>Proteus</i>	Urinary tract infections, wound infections	Amoxicillin, trimethoprim-sulfamethoxazole, cephalosporins, fluoroquinolones
<i>Pseudomonas aeruginosa</i>	Pulmonary; primary skin infection; urinary tract infection; ear or eye infections; bacteremia	Combination therapy generally required (e.g., aminoglycoside with extended-spectrum cephalosporins, piperacillin-tazobactam, or carbapenem)
<i>Salmonella enterica</i>	Diarrhea, enteric fever (serovar <i>Typhi</i> )	May prolong carrier state in simple diarrhea treatment; fluoroquinolones for enteric fever
<i>Serratia, Enterobacter</i>	Pneumonia, urinary tract infections, wound infections	Carbapenems; piperacillin-tazobactam
<i>Shigella</i>	Bacillary dysentery	Ampicillin; trimethoprim-sulfamethoxazole; fluoroquinolones
<i>Stenotrophomonas maltophilia</i>	Wide variety of local and systemic infections	Trimethoprim-sulfamethoxazole
<i>Streptobacillus moniliformis</i>	Rat-bite fever; Haverhill fever	Penicillin, doxycycline
<i>Vibrio cholerae</i>	Severe watery diarrhea	Rehydration; doxycycline, trimethoprim-sulfamethoxazole, or furazolidone shortens course
<i>Vibrio parahaemolyticus</i>	Watery diarrhea	Rehydration
<i>Vibrio vulnificus</i>	Wound infections; primary septicemia	Minocycline combined with a fluoroquinolone or cefotaxime; débridement
<b>Anaerobes</b>		
<i>Actinomyces</i>	Actinomycosis: cervicofacial, thoracic, abdominal, pelvic, central nervous system	Penicillin; alternative drugs include erythromycin, clindamycin
<i>Bacteroides fragilis</i>	Polymicrobial infections of abdomen, female genital tract, cutaneous and soft tissues	Metronidazole
<i>Clostridium botulinum</i>	Botulism: foodborne, infant, wound	Ventilatory support; use of trivalent botulinum antitoxin
<i>Clostridium difficile</i>	Antibiotic-associated diarrhea; pseudomembranous colitis	Discontinue implicated antibiotic; metronidazole
<i>Clostridium perfringens</i>	Soft-tissue infections: cellulitis, fasciitis, myonecrosis; food poisoning; septicemia	Surgical intervention and penicillin
<i>Clostridium tetani</i>	Tetanus: generalized, localized, neonatal	Clean wound; passive immunization; vaccination with tetanus toxoid
<i>Propionibacterium acne</i>	Acne; opportunistic infections (e.g., of prosthetic devices)	Acne treated with benzoyl peroxide plus clindamycin or erythromycin
<b><i>Anaplasma, Ehrlichia, Rickettsia, Coxiella, Mycoplasma, Chlamydia, and Chlamydophila</i></b>		
<i>Anaplasma</i>	Anaplasmosis (granulocytic ehrlichiosis)	Doxycycline; rifampin used as alternative therapy

<i>phagocytophilum</i>		
<i>Chlamydophila pneumoniae</i>	Pneumonia; cardiovascular disease (?)	Macrolides; fluoroquinolones; tetracyclines
<i>Chlamydophila psittaci</i>	Pneumonia	Macrolides; tetracyclines
<i>Chlamydia trachomatis</i>	Trachoma; neonatal conjunctivitis and pneumonia; urethritis; cervicitis; salpingitis; lymphogranuloma venereum	Tetracyclines; macrolides; fluoroquinolones
<i>Coxiella burnetii</i>	Q fever: acute (fever, headache, chills, myalgias, granulomatous hepatitis) and chronic (endocarditis, hepatic dysfunction)	Doxycycline; rifampin with trimethoprim-sulfamethoxazole
<i>Ehrlichia chaffeensis</i>	Monocytic ehrlichiosis	Doxycycline; rifampin used as alternative therapy
<i>Mycoplasma pneumoniae</i>	Atypical pneumonia	Macrolides; tetracycline; fluoroquinolones
<i>Rickettsia rickettsii</i>	Rocky Mountain spotted fever	Doxycycline; fluoroquinolones used as alternative therapy
<b>Spirochetes</b>		
<i>Borrelia burgdorferi</i>	Lyme disease: erythema migrans; cardiac, neurologic, or rheumatologic abnormalities	Oral penicillin; tetracyclines; ceftriaxone
<i>Borrelia recurrentis</i>	Epidemic relapsing fever	Tetracyclines; erythromycin; chloramphenicol; penicillin
<i>Borrelia species</i>	Endemic relapsing fever	Tetracyclines; erythromycin; chloramphenicol; penicillin
<i>Leptospira interrogans</i>	Leptospirosis: mild, viral-like illness to severe multiorgan illness (Weil's disease)	Penicillin; doxycycline; vaccination of pets and herds
<i>Treponema pallidum</i>	Syphilis: primary, secondary, tertiary, congenital	Penicillin; tetracyclines; erythromycin

Murray, Medical Microbiology. 5<sup>th</sup> Edition  
**Table 48-1. Overview of Selected Bacterial Pathogens**  
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