

**Table 5. Serious and/or Common Adverse Reactions Associated with Systemically Administered Drugs Used to Treat or Prevent Opportunistic Infections**

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This table should not be considered a comprehensive list of all possible adverse reactions to each medication. For additional information, clinicians should consult other appropriate resources, such as the U.S. Food and Drug Administration prescribing information. For persons of childbearing potential, please refer to [Table 7. Summary of Pre-Clinical and Human Data on, and Indications for, Opportunistic Infection Drugs During Pregnancy](#) for information regarding adverse effect potential of these medications during pregnancy.

Drug(s)	Adverse Reactions
Acyclovir	<ul style="list-style-type: none"> <li>• Crystalluria and nephrotoxicity secondary to obstructive urolithiasis, particularly after rapid high-dose IV infusion. Risk is increased with dehydration or pre-existing renal impairment. <ul style="list-style-type: none"> <li>◦ Administer IV fluid hydration to reduce the risk for nephrotoxicity.</li> </ul> </li> <li>• Neurotoxicity with high doses (agitation, confusion, hallucination, seizure, coma), especially in patients with renal impairment and/or older patients</li> <li>• Thrombophlebitis at peripheral IV infusion site</li> <li>• Nausea, vomiting, and headache</li> </ul>
Adefovir	<ul style="list-style-type: none"> <li>• Nephrotoxicity, especially in patients with underlying renal insufficiency, predisposing comorbidities, or taking concomitant nephrotoxic drugs</li> <li>• Nausea and asthenia</li> </ul>
Albendazole	<ul style="list-style-type: none"> <li>• Hepatotoxicity</li> <li>• Reversible alopecia</li> <li>• Nausea, vomiting, headache, and dizziness</li> <li>• Bone marrow suppression (i.e., pancytopenia, aplastic anemia, agranulocytosis, and leukopenia) (rare) <ul style="list-style-type: none"> <li>◦ Patients with liver disease, including hepatic echinococcosis, appear to be at higher risk.</li> </ul> </li> </ul>
Amikacin	<ul style="list-style-type: none"> <li>• Nephrotoxicity <ul style="list-style-type: none"> <li>◦ Administer IV fluid hydration to reduce the risk for nephrotoxicity.</li> </ul> </li> <li>• Ototoxicity, both hearing loss and vestibular toxicity, are possible.</li> <li>• Neuromuscular blockade, especially with myasthenia or Parkinson's disease and rapid infusion of large doses (rare)</li> </ul>
Amphotericin B Deoxycholate and Lipid Formulations	<ul style="list-style-type: none"> <li>• Nephrotoxicity (lower incidence with liposomal formulations) <ul style="list-style-type: none"> <li>◦ Administer IV fluid hydration to reduce the risk for nephrotoxicity.</li> </ul> </li> <li>• Hypokalemia, hypomagnesemia, and hypocalcemia</li> <li>• Infusion-related reactions, including fever, chills, rigors, flank or back pain, and hypotension (lower incidence with liposomal formulations)</li> <li>• Thrombophlebitis</li> </ul>

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Drug(s)	Adverse Reactions
	<ul style="list-style-type: none"> <li>• Transaminase and bilirubin elevations</li> <li>• Headache, nausea, vomiting, and diarrhea</li> <li>• Heart failure (rarely reported)</li> <li>• Anemia (rare)</li> </ul>
Anidulafungin	<ul style="list-style-type: none"> <li>• Refer to the row on Echinocandins.</li> </ul>
Artemether/Lumefantrine	<ul style="list-style-type: none"> <li>• QTc prolongation</li> <li>• Fever, chills, fatigue, arthralgia, and myalgia</li> <li>• Headache, dizziness, asthenia, and insomnia</li> <li>• Nausea, vomiting, diarrhea, abdominal pain, and anorexia</li> <li>• Rash and pruritus</li> <li>• Delayed hemolytic anemia (rare)</li> </ul>
Artesunate	<ul style="list-style-type: none"> <li>• Acute renal failure requiring dialysis</li> <li>• Hemoglobinuria and jaundice</li> <li>• Post-treatment hemolysis that may require transfusion</li> <li>• QTc prolongation and bradycardia</li> <li>• Hypersensitivity reactions (anaphylaxis)</li> <li>• Dizziness, nausea, and vomiting</li> </ul>
Atovaquone	<ul style="list-style-type: none"> <li>• Hepatotoxicity</li> <li>• Rash, nausea, vomiting, and diarrhea</li> <li>• Fever, headache, and insomnia</li> </ul>
Atovaquone/Proguanil	<ul style="list-style-type: none"> <li>• Abdominal pain, nausea, vomiting, anorexia, diarrhea, headache, asthenia, dizziness, and rash</li> <li>• Reversible transaminase elevations</li> </ul>
Azithromycin	<ul style="list-style-type: none"> <li>• Ototoxicity with prolonged use</li> <li>• Hepatotoxicity</li> <li>• Hypersensitivity reactions</li> <li>• Nausea, vomiting, diarrhea, and abdominal pain</li> <li>• QTc prolongation</li> </ul>
Benznidazole	<ul style="list-style-type: none"> <li>• Photosensitivity and hypersensitivity reactions (including allergic dermatitis, TEN, and DRESS)</li> <li>• Paresthesia and peripheral neuropathy, headache, and insomnia</li> <li>• Bone marrow suppression</li> <li>• Embryo-fetal toxicity</li> <li>• Nausea, vomiting, abdominal pain, anorexia, and weight loss</li> </ul>

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Drug(s)	Adverse Reactions
Bedaquiline	<ul style="list-style-type: none"> <li>• QTc prolongation</li> <li>• Hepatotoxicity</li> <li>• Nausea, vomiting, anorexia, diarrhea, elevated amylase, arthralgia, headache, and skin rash</li> </ul>
Bezlotoxumab	<ul style="list-style-type: none"> <li>• Exacerbation of congestive heart failure</li> <li>• Nausea, pyrexia, and headache</li> </ul>
Brincidofovir	<ul style="list-style-type: none"> <li>• Elevations in hepatic transaminases and bilirubin</li> <li>• Nausea, vomiting, and diarrhea</li> <li>• Embryo-fetal toxicity, male infertility</li> </ul>
Caspofungin	<ul style="list-style-type: none"> <li>• Refer to the row on Echinocandins.</li> </ul>
Chloroquine and Hydroxychloroquine	<ul style="list-style-type: none"> <li>• Auditory and visual disturbances, including blurry vision. Retinal toxicity may occur with long-term use.</li> <li>• QTc prolongation</li> <li>• Cardiomyopathy</li> <li>• Bone marrow suppression and hemolysis</li> <li>• Neuropsychiatric changes, including extrapyramidal reactions, suicidal behavior, and convulsive seizures</li> <li>• Hypersensitivity reactions (including TEN, SJS, and EM)</li> <li>• Severe hypoglycemia which may require adjustment of antidiabetic medications</li> <li>• Photosensitivity, pruritus, skin pigmentation, and exacerbation of psoriasis</li> <li>• Headache, nausea, vomiting, diarrhea, anorexia, abdominal pain, and hepatitis</li> <li>• Neuromyopathy (may occur with long-term use) (rare)</li> </ul>
Cidofovir	<ul style="list-style-type: none"> <li>• Nephrotoxicity, proteinuria, azotemia, proximal tubular dysfunction (normoglycemic glycosuria, hypophosphatemia), and metabolic acidosis (including Fanconi's syndrome) <ul style="list-style-type: none"> <li>◦ Administer IV fluid hydration and oral probenecid to reduce the risk for nephrotoxicity.</li> </ul> </li> <li>• Neutropenia and anemia</li> <li>• Ocular hypotony and anterior uveitis/iritis</li> <li>• Possibly carcinogenic and teratogenic; may cause hypospermia</li> <li>• Gastrointestinal intolerance and diarrhea</li> <li>• Asthenia, fever, headache, and alopecia</li> <li>• Side effects most likely related to co-administration with probenecid are rash, nausea, vomiting, anorexia, and gout exacerbation.</li> </ul>
Ciprofloxacin	<ul style="list-style-type: none"> <li>• Refer to the row on Fluoroquinolones.</li> </ul>
Clarithromycin	<ul style="list-style-type: none"> <li>• Hepatotoxicity</li> <li>• Ototoxicity, including reversible hearing loss and tinnitus, with high doses or prolonged use</li> </ul>

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Drug(s)	Adverse Reactions
	<ul style="list-style-type: none"> <li>• QTc prolongation</li> <li>• Increased risk of cardiac complications or death in patients with heart disease</li> <li>• Diarrhea</li> <li>• Headache, nausea, vomiting, diarrhea, abdominal cramps, and dysgeusia</li> </ul>
Clindamycin	<ul style="list-style-type: none"> <li>• Diarrhea, including <i>C. difficile</i>–associated diarrhea and colitis</li> <li>• Metallic taste (with IV infusion), thrombophlebitis, and arrhythmia with rapid IV infusion</li> <li>• Hypersensitivity reactions (including SJS and TEN)</li> <li>• Nausea, vomiting, abdominal pain, and abnormal liver function tests</li> </ul>
Clotrimazole (Troche)	<ul style="list-style-type: none"> <li>• Nausea, vomiting, anorexia, and metallic taste</li> </ul>
Cycloserine	<ul style="list-style-type: none"> <li>• Neuropsychiatric toxicities, including convulsions, psychosis, somnolence, confusion, inability to concentrate, hyperreflexia, headache, tremor, vertigo, paresis, dysarthria, depression (with suicidal ideation), peripheral neuropathy, and seizures (particularly with higher doses and in patients with history of chronic alcoholism) <ul style="list-style-type: none"> <li>◦ Administer with pyridoxine.</li> </ul> </li> <li>• Hypersensitivity reactions (including SJS), allergic dermatitis, and rash</li> </ul>
Dapsone	<ul style="list-style-type: none"> <li>• Methemoglobinemia, hemolytic anemia, neutropenia, and agranulocytosis <ul style="list-style-type: none"> <li>◦ Do not use in patients with moderate to severe G6PD deficiency.</li> </ul> </li> <li>• Sulfone syndrome (fever, exfoliative dermatitis, lymphadenopathy, hepatic necrosis, and hemolysis)</li> <li>• Phototoxicity and severe cutaneous reactions (including SJS and TEN)</li> <li>• Drug-induced lupus erythematosus</li> <li>• Hepatotoxicity and nephrotic syndrome</li> <li>• Peripheral neuropathy</li> <li>• Nausea and anorexia</li> </ul>
Doxycycline	<ul style="list-style-type: none"> <li>• Pill-induced esophagitis/esophageal ulceration</li> <li>• Intracranial hypertension</li> <li>• Photosensitivity and skin hyperpigmentation</li> <li>• Thrombophlebitis (with IV infusion)</li> <li>• Nausea and vomiting</li> </ul>
Echinocandins (Anidulafungin, Caspofungin, Micafungin)	<ul style="list-style-type: none"> <li>• Histamine-related infusion reactions (flushing, rash, pruritus, hypotension, and dyspnea) and thrombophlebitis</li> <li>• Hypersensitivity reactions (including anaphylaxis and anaphylactoid reaction)</li> <li>• Abnormal liver enzymes and hepatotoxicity</li> <li>• Hypokalemia</li> <li>• Embryo-fetal toxicity</li> </ul>

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Drug(s)	Adverse Reactions
	<ul style="list-style-type: none"> <li>• Diarrhea, nausea, vomiting, fever, and headache</li> <li>• Hemolysis (micafungin) (rare)</li> </ul>
Emtricitabine	<ul style="list-style-type: none"> <li>• Headache, nausea, and diarrhea</li> <li>• Skin hyperpigmentation and rash (palms and soles)</li> </ul>
Entecavir	<ul style="list-style-type: none"> <li>• Headache, fatigue, dizziness, and nausea</li> </ul>
Ethambutol	<ul style="list-style-type: none"> <li>• Optic neuritis (dose- and duration-dependent) and peripheral neuropathy</li> <li>• Headache, nausea, vomiting, anorexia, abdominal pain, and hyperuricemia/gout flare</li> </ul>
Ethionamide	<ul style="list-style-type: none"> <li>• Postural hypotension, hepatotoxicity, hypothyroidism (with or without goiter), and hypoglycemia</li> <li>• Dizziness, drowsiness, confusion, clumsiness, visual disturbances, and depression <ul style="list-style-type: none"> <li>◦ Administer with pyridoxine.</li> </ul> </li> <li>• Dose-dependent gastrointestinal side effects, including nausea, vomiting, anorexia, diarrhea, abdominal pain, and metallic taste</li> <li>• Photosensitivity and severe cutaneous reactions (including SJS, TEN, and DRESS)</li> <li>• Gynecomastia, acne, hair loss, and impotence</li> </ul>
Famciclovir	<ul style="list-style-type: none"> <li>• Nephrotoxicity (in patients with underlying renal disease)</li> <li>• Headache, nausea, vomiting, and diarrhea</li> </ul>
Fidaxomicin	<ul style="list-style-type: none"> <li>• Nausea, vomiting, and abdominal pain</li> </ul>
Flucytosine	<ul style="list-style-type: none"> <li>• Concentration-dependent (&gt;100 mcg/mL) bone marrow suppression (anemia, neutropenia, agranulocytosis, and thrombocytopenia)</li> <li>• Hepatotoxicity</li> <li>• Diarrhea, nausea, vomiting, and headache</li> <li>• Rash, pruritus, and photosensitivity</li> </ul>
Fluconazole	<ul style="list-style-type: none"> <li>• Hepatotoxicity, nausea, vomiting, diarrhea, and abdominal pain</li> <li>• QTc prolongation</li> <li>• Reversible alopecia (with doses <math>\geq 400</math> mg/day for &gt;2 months)</li> </ul>
Fluoroquinolones (ciprofloxacin, levofloxacin, moxifloxacin)	<ul style="list-style-type: none"> <li>• Restlessness, insomnia, nightmares, confusion, anxiety, paranoia, tremors, seizure, hallucinations, depression, suicidal thoughts, and attempted and completed suicide</li> <li>• Tendonitis and tendon rupture (associated with age over 60, concurrent corticosteroids, diabetes, and kidney, heart, and lung transplant)</li> <li>• Diarrhea including <i>C. difficile</i>–associated diarrhea and colitis</li> <li>• QTc prolongation</li> <li>• Photosensitivity/phototoxicity</li> <li>• Anemia, thrombocytopenia, and leukopenia</li> </ul>

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Drug(s)	Adverse Reactions
	<ul style="list-style-type: none"> <li>• Arthralgia and myalgia</li> <li>• Peripheral neuropathy and retinal detachment</li> <li>• Hyper- and hypoglycemia, including hypoglycemic coma</li> <li>• Nausea, diarrhea, bloating, headache, dizziness, and malaise</li> <li>• Vasculitis</li> <li>• Aortic dissection (rare)</li> <li>• Transaminase elevations and interstitial nephritis (rare)</li> <li>• Severe cutaneous reactions (including SJS and TEN) (rare)</li> </ul>
Foscarnet	<ul style="list-style-type: none"> <li>• Nephrotoxicity and electrolyte imbalances (e.g., hypocalcemia, hypomagnesemia, hypophosphatemia, hyperphosphatemia, hypokalemia) <ul style="list-style-type: none"> <li>◦ Administer IV fluid hydration to reduce the risk for nephrotoxicity.</li> </ul> </li> <li>• Paresthesia and seizure (associated with electrolyte imbalances)</li> <li>• Anemia</li> <li>• Nausea, vomiting, anorexia, and headache</li> <li>• Genital ulceration</li> <li>• Thrombophlebitis</li> </ul>
Ganciclovir	<ul style="list-style-type: none"> <li>• Neutropenia, thrombocytopenia, anemia, and pancytopenia</li> <li>• Carcinogenic and teratogenic potential and impaired fertility</li> <li>• Nephrotoxicity</li> <li>• Neuropathy</li> <li>• Thrombophlebitis</li> </ul>
Glecaprevir/Pibrentasvir	<ul style="list-style-type: none"> <li>• Risk of hepatitis B virus reactivation</li> <li>• Hepatic decompensation/failure in patients with advanced liver disease</li> <li>• Mild headache, fatigue, nausea, and diarrhea</li> <li>• Altered glucose tolerance in diabetic patients</li> </ul>
Interferon-Alfa and Peginterferon-Alfa	<ul style="list-style-type: none"> <li>• Neuropsychiatric effects (e.g., depression, suicidal ideation)</li> <li>• Neutropenia, anemia, and thrombocytopenia</li> <li>• Flu-like syndrome (e.g., fever, headache, fatigue, myalgia)</li> <li>• Hepatitis exacerbations, thyroid dysfunction, and alopecia</li> <li>• Nausea, anorexia, diarrhea, and weight loss</li> <li>• Development or exacerbation of autoimmune diseases and ocular effects (e.g., retinal hemorrhage, retinal artery or vein obstructions, and cotton wool spots)</li> <li>• Ischemic and hemorrhagic cerebrovascular events, cardiovascular and pulmonary effects, hyper- and hypoglycemia, diabetes, severe infection, and colitis</li> </ul>

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Drug(s)	Adverse Reactions
	<ul style="list-style-type: none"> <li>• Hypersensitivity reactions</li> </ul>
Isavuconazonium Sulfate (Isavuconazole)	<ul style="list-style-type: none"> <li>• Hepatotoxicity and cholelithiasis</li> <li>• Infusion-related reactions (hypotension, dyspnea, chills, dizziness, paresthesia, and hypoesthesia)</li> <li>• Hypersensitivity reactions (including SJS)</li> <li>• Embryo-fetal toxicity</li> <li>• Shortening of QT interval</li> <li>• Nausea, vomiting, diarrhea, headache, hypokalemia, dyspnea, and cough</li> </ul>
Isoniazid	<ul style="list-style-type: none"> <li>• Hepatotoxicity and asymptomatic elevation in aminotransferase enzymes</li> <li>• Peripheral neuropathy, paresthesia, seizures, and optic neuritis <ul style="list-style-type: none"> <li>◦ Administer with pyridoxine</li> </ul> </li> <li>• Nausea, diarrhea, and flushing</li> <li>• Arthralgia and lupus-like syndrome</li> <li>• Psychosis (rare)</li> <li>• Hypersensitivity reactions (including TEN and DRESS) (rare)</li> </ul>
Itraconazole	<ul style="list-style-type: none"> <li>• Congestive heart failure, edema, and hypokalemia</li> <li>• QTc prolongation</li> <li>• Hepatotoxicity</li> <li>• Hearing loss</li> <li>• Neuropathy</li> <li>• Gynecomastia</li> <li>• Nausea, vomiting, diarrhea, and abdominal pain</li> </ul>
Lamivudine	<ul style="list-style-type: none"> <li>• Nausea and vomiting</li> </ul>
Levofloxacin	<ul style="list-style-type: none"> <li>• Refer to the row on Fluoroquinolones.</li> </ul>
Linezolid	<ul style="list-style-type: none"> <li>• Anemia, neutropenia, and thrombocytopenia (especially with treatment lasting longer than 2–4 weeks and renal insufficiency)</li> <li>• Peripheral neuropathy and optic neuritis with long-term therapy</li> <li>• Nausea, vomiting, diarrhea, and headache</li> <li>• Serotonin syndrome (rare)</li> <li>• Seizure (in patients with a history of seizure or with risk factors for seizure) (rare)</li> <li>• Lactic acidosis, hypoglycemia, and hyponatremia (rare)</li> </ul>
Mefloquine	<ul style="list-style-type: none"> <li>• Depression, psychosis, anxiety, agitation, dizziness, headache, insomnia, and abnormal dreams</li> <li>• QTc prolongation and arrhythmias (extrasystole and sinus bradycardia)</li> </ul>

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Drug(s)	Adverse Reactions
	<ul style="list-style-type: none"> <li>• Agranulocytosis and aplastic anemia</li> <li>• Nausea, vomiting, diarrhea, and epigastric pain</li> </ul>
Micafungin	<ul style="list-style-type: none"> <li>• Refer to the row on Echinocandins.</li> </ul>
Miconazole Buccal Tablets	<ul style="list-style-type: none"> <li>• Dysgeusia, diarrhea, nausea, vomiting, upper abdominal pain, and headache</li> <li>• Local reactions (e.g., oral discomfort, burning, pain, tongue/mouth ulceration, gingival pruritus, swelling, and dry mouth)</li> <li>• Hypersensitivity reaction (may occur in patients with known hypersensitivity reaction to milk product concentrate)</li> </ul>
Miltefosine	<ul style="list-style-type: none"> <li>• Nephrotoxicity and elevated transaminases and bilirubin</li> <li>• Retinal degeneration</li> <li>• Leukocytosis and thrombocytopenia</li> <li>• Embryo-fetal toxicity and impaired fertility, scrotal pain, and impaired ejaculation</li> <li>• Nausea, vomiting, diarrhea, anorexia, headache, and motion sickness</li> <li>• Severe cutaneous reactions (including SJS)</li> </ul>
Moxifloxacin	<ul style="list-style-type: none"> <li>• Refer to the row on Fluoroquinolones.</li> </ul>
Nifurtimox	<ul style="list-style-type: none"> <li>• Patients with a history of brain injury, seizures, psychiatric disease, and serious behavioral alterations may experience worsening of their conditions.</li> <li>• Vomiting, abdominal pain, headache, decreased appetite, weight loss, nausea, pyrexia, rash, polyneuropathy, insomnia, dizziness, and vertigo</li> <li>• Carcinogenic and teratogenic potential and impaired fertility</li> <li>• Hypersensitivity reactions with hypotension, angioedema, dyspnea, pruritus, rash or other severe skin reactions</li> </ul>
Nitazoxanide	<ul style="list-style-type: none"> <li>• Nausea, vomiting, diarrhea, abdominal pain, headache, and chromaturia</li> </ul>
Nystatin (Oral Preparations)	<ul style="list-style-type: none"> <li>• Unpleasant taste, nausea, vomiting, anorexia, and diarrhea</li> </ul>
Paromomycin	<ul style="list-style-type: none"> <li>• Nausea, vomiting, abdominal cramps, anorexia, rash, and headache</li> <li>• Nephrotoxicity (rare) <ul style="list-style-type: none"> <li>◦ Inflammatory bowel disease and renal insufficiency may increase risk.</li> </ul> </li> </ul>
Penicillin G	<p><b>All Penicillin G Preparations</b></p> <ul style="list-style-type: none"> <li>• Hypersensitivity (immediate or delayed reactions, including anaphylaxis), bone marrow suppression, nausea, vomiting, diarrhea, and drug fever</li> <li>• Jarisch-Herxheimer reaction when used for syphilis (occurs most frequently in persons with early syphilis, high non-treponemal antibody titers, and prior penicillin treatment)</li> </ul> <p><b>Benzathine Penicillin G</b></p>



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Drug(s)	Adverse Reactions
	<ul style="list-style-type: none"> <li>IM injection-site reactions (pain and erythema), procaine neuropsychiatric reactions (with high dose), and neurovascular damage (due to inadvertent intravascular instead of IM injection)</li> </ul> <p><b>Aqueous Crystalline Penicillin G (IV)</b></p> <ul style="list-style-type: none"> <li>Thrombophlebitis</li> <li>Neurotoxicity at high doses—especially in patients with renal dysfunction—and hyperkalemia or hyponatremia at high doses (depending on formulation)</li> </ul>
Pentamidine	<ul style="list-style-type: none"> <li>Nephrotoxicity, infusion-related hypotension, and thrombophlebitis</li> <li>QTc prolongation, arrhythmias (including Torsades de pointes), and electrolyte abnormalities</li> <li>Hypoglycemia, hyperglycemia, and diabetes mellitus</li> <li>Hepatotoxicity and GI intolerance</li> <li>Leukopenia and thrombocytopenia</li> <li>Embryotoxic</li> <li>Rash</li> <li>Pancreatitis (rare)</li> </ul> <p><b>Aerosolized Therapy</b></p> <ul style="list-style-type: none"> <li>Bronchospasm, cough, dyspnea, tachypnea, and metallic taste</li> </ul>
Posaconazole	<ul style="list-style-type: none"> <li>Hepatotoxicity, QTc prolongation, and hypokalemia</li> <li>Pseudohyperaldosteronism (hypokalemia and hypertension)</li> <li>Nausea, vomiting, diarrhea, abdominal pain, and headache</li> </ul> <p><b>IV Infusion</b></p> <ul style="list-style-type: none"> <li>Thrombophlebitis, SBEC accumulation, and worsening renal function with IV formulation (especially in patients with eGFR &lt;50 mL/min per package labeling, but observational studies with IV voriconazole suggest that this may not be a concern)</li> </ul>
Primaquine	<ul style="list-style-type: none"> <li>Methemoglobinemia, hemolytic anemia (use with caution in patients with mild-moderate G6PD deficiency; do not use if severe G6PD deficiency), leukopenia, and neutropenia</li> <li>QTc prolongation</li> <li>Abdominal cramps, nausea, vomiting, and dizziness</li> </ul>
Pyrazinamide	<ul style="list-style-type: none"> <li>Hepatotoxicity</li> <li>Polyarthralgia and myalgia</li> <li>Hyperuricemia/gout flare</li> <li>Thrombocytopenia and sideroblastic anemia</li> <li>Nausea, vomiting, flushing, rash, and photosensitivity</li> </ul>
Pyrimethamine	<ul style="list-style-type: none"> <li>Neutropenia, thrombocytopenia, and megaloblastic anemia <ul style="list-style-type: none"> <li>Administer with leucovorin.</li> </ul> </li> </ul>

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Drug(s)	Adverse Reactions
	<ul style="list-style-type: none"> <li>Anorexia, vomiting, and rash</li> </ul>
Quinine	<ul style="list-style-type: none"> <li>QTc prolongation and cardiac arrhythmias</li> <li>Cinchonism (tinnitus, vertigo, and blurred vision)</li> <li>Hemolytic anemia (especially in patients with G6PD deficiency), thrombocytopenia, and agranulocytosis</li> <li>Vision abnormalities (e.g., photophobia, altered color perception, and blindness)</li> <li>Hypersensitivity reactions (including SJS and TEN)</li> <li>Hypoglycemia</li> <li>Headache, nausea, vomiting, and diarrhea</li> </ul>
Rifabutin	<ul style="list-style-type: none"> <li>Uveitis (concentration-dependent)</li> <li>Neutropenia and thrombocytopenia</li> <li>Arthralgia</li> <li>Hepatotoxicity</li> <li>Rash</li> <li>Nausea, vomiting, abdominal pain, diarrhea, and anorexia</li> <li>Red-orange discoloration of body fluids</li> </ul>
Rifampin	<ul style="list-style-type: none"> <li>Hepatotoxicity (cholestatic hepatitis)</li> <li>Thrombocytopenia and hemolytic anemia</li> <li>Renal failure</li> <li>Hypersensitivity reactions with flu-like syndrome</li> <li>Interstitial pulmonary disease</li> <li>Nausea, vomiting, anorexia, abdominal pain, flatulence, diarrhea, headache, confusion, and flushing, rash</li> <li>Red-orange discoloration of body fluids</li> </ul>
Rifapentine	<ul style="list-style-type: none"> <li>Hepatotoxicity</li> <li>Anemia, neutropenia, and lymphopenia</li> <li>Hypersensitivity reactions</li> <li>Arthralgia</li> <li>Rash and pruritis</li> <li>Nausea, vomiting, diarrhea, and anorexia</li> <li>Red-orange discoloration of body fluids</li> </ul>
Sofosbuvir/Velpatasvir	<ul style="list-style-type: none"> <li>Risk of hepatitis B virus reactivation</li> <li>Headache, fatigue, and anemia (associated with ribavirin co-administration)</li> <li>Altered glucose tolerance in diabetic patients</li> </ul>

**Table 5. Serious and/or Common Adverse Reactions Associated with Systemically Administered Drugs Used to Treat or Prevent Opportunistic Infections**

Drug(s)	Adverse Reactions
Streptomycin	<ul style="list-style-type: none"> <li>• Neurotoxicity including irreversible ototoxicity (both hearing loss and vestibular toxicity)</li> <li>• Nephrotoxicity</li> <li>• Neuromuscular blockade and respiratory paralysis (associated with rapid infusion of large aminoglycoside doses)</li> </ul>
Sulfadiazine	<ul style="list-style-type: none"> <li>• Severe cutaneous reactions (including SJS, EM, and TEN) and photosensitivity</li> <li>• Anemia, neutropenia, agranulocytosis, and thrombocytopenia</li> <li>• Crystalluria (nephrolithiasis, urolithiasis) and nephrotoxicity</li> <li>• Hepatotoxicity</li> <li>• Drug fever</li> <li>• Peripheral neuritis, tinnitus, vertigo, and insomnia</li> <li>• Nausea, vomiting, and headache</li> </ul>
Tafenoquine	<ul style="list-style-type: none"> <li>• Decreased hemoglobin and methemoglobinemia and hemolytic anemia <ul style="list-style-type: none"> <li>◦ Do not use in patients with G6PD deficiency; may cause harm to fetuses and breastfeeding infants who are G6PD deficient.</li> </ul> </li> <li>• Psychiatric adverse reactions (in patients with history of psychiatric illness)</li> <li>• Hypersensitivity reactions (angioedema and urticaria)</li> <li>• Visual disturbances</li> <li>• Dizziness, nausea, vomiting, and headache</li> </ul>
Tecovirimat	<ul style="list-style-type: none"> <li>• Headache, nausea, abdominal pain, and vomiting</li> </ul> <p><b>IV formulation</b></p> <ul style="list-style-type: none"> <li>• Infusion site pain, swelling, erythema, and extravasation</li> <li>• Contains hydroxypropyl-<math>\beta</math>-cyclodextrin, which may accumulate in patients with renal impairment and has the potential to cause renal toxicity</li> </ul>
Tenofovir disoproxil fumarate	<ul style="list-style-type: none"> <li>• Renal insufficiency and Fanconi syndrome (proximal renal tubulopathy with hypophosphatemia, hypouricemia, proteinuria, and normoglycemic glycosuria)</li> <li>• Decrease in bone mineral density</li> <li>• Nausea and vomiting</li> </ul>
Tenofovir alafenamide	<ul style="list-style-type: none"> <li>• Headache, abdominal pain, fatigue, and nausea</li> <li>• Lower incidence of renal or bone toxicities than with tenofovir disoproxil fumarate</li> </ul>
Trimethoprim-Sulfamethoxazole	<ul style="list-style-type: none"> <li>• Cutaneous reactions (in some cases SJS, EM, and TEN) and photosensitivity</li> <li>• Anemia, neutropenia, agranulocytosis, and thrombocytopenia</li> <li>• Hepatotoxicity</li> <li>• Dose-dependent increase in serum creatinine (without change in GFR), interstitial nephritis, crystalluria (in patients with inadequate hydration), and hyperkalemia (with high-dose TMP)</li> </ul>

**Table 5. Serious and/or Common Adverse Reactions Associated with Systemically Administered Drugs Used to Treat or Prevent Opportunistic Infections**

Drug(s)	Adverse Reactions
	<ul style="list-style-type: none"> <li>• Hypoglycemia and hyponatremia</li> <li>• Drug fever</li> <li>• Nausea and vomiting</li> <li>• Aseptic meningitis and pancreatitis (rare)</li> </ul>
Valacyclovir	<ul style="list-style-type: none"> <li>• Neurotoxicity (e.g., agitation, confusion, hallucination, seizure, coma) with high doses, especially in patients with renal impairment</li> <li>• Nephrotoxicity</li> <li>• Nausea, vomiting, abdominal pain, and headache</li> </ul>
Valganciclovir	<ul style="list-style-type: none"> <li>• Bone marrow suppression</li> <li>• Confusion, pyrexia, and tremor</li> <li>• Nephrotoxicity</li> <li>• Carcinogenic and teratogenic potential and impaired fertility</li> <li>• Nausea, vomiting, and diarrhea</li> </ul>
Voriconazole	<ul style="list-style-type: none"> <li>• Visual disturbances (e.g., abnormal vision, color vision change, and/or photophobia)</li> <li>• Optic neuritis (associated with &gt;28 days treatment)</li> <li>• Headache, delirium, hallucination, peripheral neuropathy (rare), and encephalopathy (associated with trough &gt;5.5 mcg/mL)</li> <li>• Hepatotoxicity</li> <li>• QTc prolongation</li> <li>• Photosensitivity</li> <li>• Voriconazole-associated cutaneous squamous cell carcinoma (with long-term use)</li> <li>• Fluorosis and periostitis with high dose and/or prolonged use</li> <li>• Fever, nausea, vomiting, chills, tachycardia, and peripheral edema</li> <li>• Embryo-fetal toxicity</li> <li>• Nail changes and alopecia (with long-term use)</li> <li>• SBECD accumulation with IV formulation and worsening renal function (especially in patients with eGFR &lt;50 mL/min per package labeling, but observational studies suggest that this may not be a concern)</li> </ul>

**Key:** DRESS = drug reaction with eosinophilia and systemic symptoms; eGFR = estimated glomerular filtration rate; EM = erythema multiforme; G6PD = glucose-6-phosphate dehydrogenase; GFR = glomerular filtration rate; GI = gastrointestinal; IM = intramuscular; IV = intravenous; QTc = QT corrected for heart rate; SBECD = sulfobutylether cyclodextrin; SJS = Stevens-Johnson syndrome; TEN = toxic epidermal necrolysis; TMP = trimethoprim