

TABLE 6. Treatment of AIDS-associated opportunistic infections among adults

| Opportunistic infections | Preferred therapy and duration | Alternative therapy | Other options/issues |
|---|---|--|---|
| <i>Pneumocystis jirovecii</i> Pneumonia (PCP) | <p>Acute therapy</p> <ul style="list-style-type: none"> Trimethoprim-Sulfamethoxazole (TMP/SMX): [15–20 mg TMP and 75–100 mg SMX]/kg body weight/day IV administered q6h or q8h (AI); or Same daily dose of TMP/SMX PO in 3 divided doses (AI); or TMP-SMX DS 2 tablets 3 times a day (AI) <p>Total duration = 21 days (AII)</p> <p>Chronic maintenance therapy (Secondary prophylaxis) First choice:</p> <ul style="list-style-type: none"> Trimethoprim-sulfamethoxazole (TMP-SMX) 1 double-strength tablet (DS) PO QD (AI); or TMP-SMX 1 single-strength tablet (SS) PO QD (AI) <p>Alternatives</p> <ul style="list-style-type: none"> Dapsone 50 mg PO twice daily or 100 mg PO daily (BI); or Dapsone 50 mg PO daily plus pyrimethamine 50 mg PO weekly plus leucovorin 25 mg PO weekly (BI); or Dapsone 200 mg PO plus pyrimethamine 75 mg PO plus leucovorin 25 mg PO weekly (BI); aerosolized pentamidine 300 mg every month via Respigard nebulizer (manufactured by Marquest, Englewood, Colorado) (BI); or Atovaquone 1,500 mg PO QD (BI); or TMP-SMX 1 DS PO TIW (CI) | <p>For severe PCP:</p> <ul style="list-style-type: none"> Pentamidine 4 mg/kg IV QD infused over at least 60 minutes (AI), some specialists reduce dose to 3 mg/kg IV QD because of toxicities (BI) <p>For mild-to-moderate PCP:</p> <ul style="list-style-type: none"> Dapsone 100mg PO QD and TMP 15 mg/kg/day PO (3 divided dose) (BI); or Primaquine 15–30mg (base) PO QD and Clindamycin 600–900 mg IV q6h to q8h or Clindamycin 300–450 mg PO q6h to q8h (BI); or Atovaquone 750 mg PO BID with food (BI); or Trimetrexate 45mg/m² or 1.2 mg/kg IV QD with leucovorin 20 mg/m² or 0.5 mg/kg IV or PO q6h (leucovorin must be continued for 3 days after the last trimetrexate dose) (BI); addition of dapsone or sulfamethoxazole or sulfadiazine might improve efficacy (CIII) | <p>Indications for corticosteroids (AI): PaO₂ <70 mm/Hg at room air; or alveolar-arterial O₂ gradient >35 mm/Hg</p> <p>Prednisone doses (beginning as early as possible and within 72 hours of PCP therapy) (AI): 40 mg BID days 1–5, 40mg QD days 6–10, then 20 mg QD days 11–21</p> <p>IV methylprednisolone can be administered as 75% of prednisone dose</p> <p>Chronic Maintenance Therapy (Secondary prophylaxis) should be discontinued if CD4⁺ T lymphocyte count increases in response to ART from <200 to >200 cells/μL for ≥3 months (AI)</p> |
| <i>Toxoplasma gondii</i> encephalitis (TE) | <p>Acute therapy</p> <p>Pyrimethamine 200 mg POx1, then 50 mg (<60 kg body weight) to 75 mg (≥60 kg) PO QD and sulfadiazine 1,000 (<60 kg) to 1,500 mg (≥60 kg) PO q6h plus leucovorin 10–20 mg PO QD (can increase ≥50 mg) (AI)</p> <p>Total duration for acute therapy is at least 6 weeks (BII)</p> <p>Chronic maintenance therapy (Secondary Prophylaxis) First choice</p> <ul style="list-style-type: none"> Sulfadiazine 500–1,000 mg PO QID plus pyrimethamine 25–50 mg PO QD plus leucovorin 10–25 mg by mouth daily (AI) <p>Second choice</p> <ul style="list-style-type: none"> Clindamycin 300–450 mg PO every 6–8 hours plus pyrimethamine 25–50 mg PO QD plus leucovorin 10–25 PO QD (BI); or Atovaquone 750 mg PO every 6–12 hours with or without pyrimethamine 25 mg PO QD plus leucovorin 10 mg PO QD (CIII) | <ul style="list-style-type: none"> Pyrimethamine (leucovorin)* and clindamycin 600 mg IV or PO q6h (AI); or TMP-SMX (5 mg/kg TMP and 25 mg/kg SMX) IV or PO BID (BI); or Atovaquone 1,500 mg PO BID with meals (or nutritional supplement) and pyrimethamine (leucovorin)* (BI); or Atovaquone 1,500 mg PO BID with meals (or nutritional supplement) and sulfadiazine 1,000–1,500 mg PO q6h (BI); or Atovaquone 1,500 mg PO BID with meals (BI); or Pyrimethamine (leucovorin)* and azithromycin 900–1200 mg PO QD (BI) <p>For severely ill patients who cannot take oral medications TMP-SMX IV and Pyrimethamine PO (CIII)</p> <p>For other regimens with limited experience (CIII), see text.</p> | <p>Adjunctive corticosteroids (e.g., dexamethasone) should be administered when clinically indicated for treatment of mass effect attributed to focal lesions or associated edema (BIII) and discontinued as soon as clinically feasible</p> <p>Anticonvulsants should be administered to patients with a history of seizures (AIII)</p> <p>Secondary prophylaxis may be discontinued if</p> <ul style="list-style-type: none"> Free of TE signs and symptoms; and sustained CD4⁺ T lymphocyte count of >200 cells/μL for >6 months of ART (CIII) |
| Cryptosporidiosis | <p>Symptomatic treatment of diarrhea (AIII)</p> <p>Effective ART (to increase CD4⁺ count to >100 cells/μL) can result in complete, sustained clinical, microbiological and histologic resolution of HIV-associated cryptosporidiosis (AII)</p> | <p>Nitazoxanide 500 mg PO BID Paromomycin 25–35 mg/kg body weight PO in 2 to 4 divided doses</p> | <p>Supportive care including hydration, nutritional support</p> |

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| Microsporidiosis | <p>Initiate or optimize ART with immune reconstitution to CD4⁺ >100 cells/μL (AII)</p> <p><u>For disseminated (not ocular) and intestinal infection attributed to microsporidia other than <i>Enterocytozoon bienuesi</i></u></p> <ul style="list-style-type: none"> Albendazole 400 mg PO BID (AII), continue until CD4⁺ >200 cells/μL (AIII) <p><u>For ocular infection</u></p> <ul style="list-style-type: none"> Fumidil B 3 mg/mL in saline (final concentration is fumagillin 70 μg/mL) eye drops continued indefinitely (not available in U.S.) (BII) and Albendazole 400 mg PO BID for management of systemic infection (BIII) <p><u>For gastrointestinal infections caused by <i>Enterocytozoon bienuesi</i></u></p> <ul style="list-style-type: none"> Fumagillin 60 mg PO QD (not available in U.S.) (BII) | <p><u>Disseminated disease</u></p> <p>Itraconazole 400 mg PO QD and albendazole for disseminated disease attributed to <i>Trachipleistophora</i> or <i>Brachiola</i> (CIII)</p> | <p>Fluid support among patients with diarrhea resulting in severe dehydration (AIII)</p> <p>Nutritional supplement for patients with severe malnutrition and wasting (AIII)</p> <p>Treatment for ocular infection should be continued indefinitely (BIII); with immune reconstitution, it is possible that this treatment might be discontinued (CIII)</p> <p>Chronic maintenance therapy may be discontinued if patients (CIII):</p> <ul style="list-style-type: none"> remain asymptomatic with regards to signs and symptoms of microsporidiosis; sustained CD4⁺ T-lymphocyte counts >200 cells/μL for >6 months on ART |
| <i>Mycobacterium tuberculosis</i> (MTB) | <p>For drug-sensitive MTB</p> <p><u>Initial phase (8 weeks) (AI)</u></p> <p>Isoniazid (INH) 5 mg/kg body weight (max: 300 mg) PO QD and rifampin 10 mg/kg (max: 600 mg) PO QD or rifabutin 300 mg PO QD (or dose adjusted based on concomitant meds¹) and pyrazinamide (PZA) (dose based on weight⁵) PO QD and ethambutol (EMB) (dose based on weight⁶) PO QD</p> <p><u>Continuation phase (18 weeks) (AI)</u></p> <ul style="list-style-type: none"> INH 5mg/kg (max: 300 mg) PO QD and [Rifampin 10 mg/kg (max: 600 mg) or Rifabutin 300 mg PO QD]; or INH 15 mg/kg (max: 900 mg) PO BIW or TIW plus [Rifampin 10 mg/kg (max: 600 mg) or Rifabutin 300 mg PO TIW] <p>In patients with delayed clinical or microbiological response to initial therapy (e.g., sputum culture (+) after 2 months or if cavitary pulmonary lesions are present), total duration up to 9 months (BII)</p> | <p>Treatment for drug-resistant MTB:</p> <p><u>Resistant to INH</u></p> <ul style="list-style-type: none"> Discontinue INH (and streptomycin, if used) Rifamycin, PZA, and EMB for 6 months (BII); or Rifamycin and EMB for 12 months (preferably with PZA during at least first 2 months) (BII) <p><u>Resistant to Rifamycin</u></p> <ul style="list-style-type: none"> INH and PZA and EMB and a fluoroquinolone (e.g., levofloxacin 500 mg/day) for 2 months, followed by 10–16 additional months with INH and EMB and fluoroquinolone (BIII) <p><u>Multidrug resistant (MDR) TB – both INH and rifamycin resistant</u></p> <ul style="list-style-type: none"> Therapy should be individualized based on resistance pattern and with close consultation with experienced specialist (AIII) <p>TB treatment in patients with liver disease</p> <p><u>If AST \geq3 times normal before treatment initiation</u></p> <ul style="list-style-type: none"> Standard therapy with frequent monitoring; or Rifamycin and EMB and PZA for 6 months INH and rifamycin and EMB for 2 months, then INH and rifamycin for 7 months (BII) <p><u>For patients with severe liver disease</u></p> <ul style="list-style-type: none"> Rifamycin and EMB for 12 months (preferably with another agent such as fluoroquinolone for first 2 months) (CII) | <p>Treatment by directly observed therapy (DOT) is strongly recommended for all HIV patients (AII)</p> <p>Rifabutin has less drug interaction potential and can be used in place of rifampin</p> <p>Rifapentine administered once weekly can result in development of resistance; it is not recommended among HIV patients (EI)</p> <p>Twice weekly intermittent regimen containing rifamycin might lead to rifamycin resistance, particularly among advanced HIV patients with CD4⁺ T-cell count <100 cells/μL; in this situation, therapy must be administered as daily or three times weekly</p> <p>For paradoxical reaction that is not severe, may be treated with nonsteroidal anti-inflammatory drugs (NSAIDs) without change in TB or HIV medications (BIII)</p> |

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| <i>Mycobacterium avium</i> complex disease | <p>At least 2 drugs as initial therapy Clarithromycin 500 mg PO BID (A1) and ethambutol 15 mg/kg body weight PO QD (A1)</p> <p>Consider adding third drug for patients with advanced immunosuppression (CD4⁺ <50), high mycobacterial loads, or in the absence of effective ART; rifabutin 300 mg PO QD (A1) (dosage may be adjusted based on drug-drug interactions) (CIII)</p> <p>Duration (Chronic Maintenance Therapy): Lifelong therapy unless in patients with sustained immune recovery on ART (AII)</p> <p><u>Chronic maintenance therapy</u> (Secondary Prophylaxis) <i>First choice</i></p> <ul style="list-style-type: none"> Clarithromycin 500 mg PO BID (A1) plus ethambutol 15 mg/kg PO daily (AII); with or without rifabutin 300 mg PO QD (C1) <p><i>Second choice</i></p> <ul style="list-style-type: none"> Azithromycin 500 mg PO QD (AII) plus ethambutol 15 mg/kg PO QD (AII); with or without rifabutin 300 mg PO QD (C1) | <p>Alternative to Clarithromycin Azithromycin 500–600 mg PO QD (AII)</p> <p>Alternative third or fourth drug for patients with more severe symptoms or disseminated disease (CIII)</p> <ul style="list-style-type: none"> Ciprofloxacin 500–750 mg PO BID; or Levofloxacin 500 mg PO QD; or Amikacin 10–15 mg/kg IV QD | <p>NSAIDs may be used for patients who experience moderate to severe symptoms attributed to ART-associated immune reconstitution syndrome (CIII)</p> <p>If symptoms persist, short term (4–8 weeks) of systemic corticosteroid (20–40 mg of prednisone QD) can be used (CIII).</p> <p>Maintenance therapy can be discontinued in patients who (BII)</p> <ul style="list-style-type: none"> completed ≥12 months therapy, and remain asymptomatic, and have sustained (≥6 months) CD4⁺ count >100 cells/μL |
| Bacterial Pneumonia | <p><u>Empiric therapy (targeting towards <i>Streptococcus pneumoniae</i> and <i>Hemophilus influenzae</i>)</u></p> <ul style="list-style-type: none"> Extended spectrum cephalosporin (e.g., cefotaxime, or ceftriaxone) (AIII); or Fluoroquinolone with enhanced activity against pneumococcus (e.g., gatifloxacin, levofloxacin, or moxifloxacin) (AIII) <p><u>Empiric therapy in patients with severe illness</u></p> <ul style="list-style-type: none"> Extended-spectrum cephalosporin and a macrolide or quinolone (AIII) | <p>For high-level penicillin-resistant isolates (MIC ≥4.0 μg/mL)</p> <ul style="list-style-type: none"> Consider adding vancomycin or a fluoroquinolone (CIII); therapy should be guided by susceptibility results <u>Empiric therapy in patients with severe immunodeficiency (CD4⁺ T-cell count <100 cells/μL), a known history of previous <i>pseudomonas</i> infection, bronchiectasis, or relative or absolute neutropenia) (BIII)</u> Broaden empiric coverage to include antimicrobials with activities against <i>P. aeruginosa</i> and other gram-negative bacilli (e.g. ceftazidime, cefepime, piperacillin-tazobactam, a carbapenem, or high-dose ciprofloxacin or levofloxacin) If ceftazidime or ciprofloxacin is used, addition of another antibacterial with optimal coverage for gram-positive infection is recommended | <p>Patients with CD4⁺ T-cell count of ≥200 cells/μL should receive a single dose of 23-valent polysaccharide pneumococcal vaccine (if not received during the preceding 5 years) (BII)</p> <p>Yearly influenza vaccine might be useful in preventing pneumococcal superinfection after influenza respiratory infection (BII)</p> <p>Antibiotic prophylaxis may be considered among patients with frequent recurrences (CIII); caution should be taken for the risks for developing drug resistance and drug toxicities</p> |
| Salmonellosis | <p><u><i>Salmonella gastroenteritis</i></u></p> <ul style="list-style-type: none"> Ciprofloxacin 500 mg–750 mg PO BID (or 400 mg IV BID) (AIII) <p><u>Duration</u></p> <ul style="list-style-type: none"> Mild gastroenteritis without bacteremia, 7–14 days (BIII) Advanced HIV (CD4⁺ <200) and/or bacteremia, at least 4–6 weeks (BIII) <p><u>Chronic Suppressive Therapy</u></p> <ul style="list-style-type: none"> For patients with <i>Salmonella</i> bacteremia, ciprofloxacin 500 mg PO BID (BII) | <ul style="list-style-type: none"> TMP-SMX PO or IV (BIII) Third generation cephalosporin such as ceftriaxone (IV) or cefotaxime (IV) (BIII) | <p>Treatment is recommended among HIV patients because of high risk for bacteremia among this population (BIII)</p> <p>Newer fluoroquinolones (e.g., levofloxacin, gatifloxacin, or moxifloxacin) might also be effective (BIII)</p> |

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| <i>Campylobacter jejuni</i> infections | <p>For mild disease – might withhold therapy unless symptoms persist for several days</p> <p>Optimal therapy – not well defined; options include</p> <ul style="list-style-type: none"> • ciprofloxacin 500 mg PO BID (BIII); or • azithromycin 500 mg PO QD (BIII); or • consider addition of an aminoglycoside in bacteremic patients (CIII) <p>Duration</p> <ul style="list-style-type: none"> • Mild to moderate disease, 7 days • Bacteremia: at least 2 weeks | | <p>An increasing rate of quinolone resistance is observed</p> <p>Antimicrobial therapy should be modified based on susceptibility reports</p> <p>Role of aminoglycoside is unclear</p> |
| Shigellosis | <p>Fluoroquinolone IV or PO for 3–7 days (AIII)</p> <p>Duration for bacteremia, 14 days (AIII)</p> | <ul style="list-style-type: none"> • TMP-SMX DS 1 tablet PO BID for 3–7 days; or (BIII) • Azithromycin 500 mg PO on day 1, then 250 mg PO QD for 4 days (BIII) <p>Duration for bacteremia, 14 days (AIII)</p> | <p>Therapy is indicated both to shorten the duration of illness and to prevent spread of infection (AIII)</p> <p>Shigella infections acquired outside of United States have high rates of TMP-SMX resistance</p> |
| Bartonella infections | <p>Non-CNS infections</p> <ul style="list-style-type: none"> • Erythromycin 500 mg PO QID (or IV at same dose if unable to take PO) (AII); or • Doxycycline 100 mg PO or IV q12h (AII) <p>CNS infections</p> <ul style="list-style-type: none"> • Doxycycline 100 mg PO or IV q12h (AIII) <p>Duration</p> <p>At least 3 months (AII)</p> <p>Long-term suppression with erythromycin or doxycycline may be considered in patients with relapse or re-infection (CIII)</p> | <ul style="list-style-type: none"> • Azithromycin 600 mg PO QD (BII) • Clarithromycin 500 mg PO BID (BII) • Fluoroquinolones have variable activity in case reports and in vitro; may be considered as alternative (CIII) | |
| <i>Treponema pallidum</i> infection (syphilis) | <p>Early stage (primary, secondary, and early latent syphilis)</p> <ul style="list-style-type: none"> • Benzathine penicillin G 2.4 MU IM for 1 (AII) <p>Late-latent disease (≥ 1yr or of unknown duration, without CNS involvement)</p> <ul style="list-style-type: none"> • Benzathine penicillin G 2.4 MU IM weekly for 3 weeks (AIII) <p>Late-stage (aortitis and gummata)</p> <ul style="list-style-type: none"> • Infectious diseases consultation (AIII) <p>Neurosyphilis (CNS involvement including otic and ocular disease)</p> <ul style="list-style-type: none"> • Aqueous crystalline penicillin G 3–4 MU IV q4h or total dose by continuous IV infusion for 10–14 days (AII) and/or benzathine penicillin G 2.4 MU IM weekly for 3 weeks after completion of IV therapy (CIII) | <p>Early stage (primary, secondary, and early latent syphilis)—treatment with close clinical monitoring (BIII)</p> <ul style="list-style-type: none"> • Doxycycline 100 mg PO BID for 14 days; or • Ceftriaxone 1 g IM or IV QD for 8–10 days; or • Azithromycin 2 g PO for 1 dose <p>Late-latent disease (without CNS involvement)</p> <ul style="list-style-type: none"> • Doxycycline 100 mg PO BID for 28 days (BIII) <p>Neurosyphilis</p> <ul style="list-style-type: none"> • Procaine penicillin 2.4 MU IM QD and probenecid 500 mg PO QID for 10–14 days (BII) and/or benzathine penicillin G 2.4 MU IM weekly for 3 weeks after completion of above (CIII); or • For penicillin-allergic patients Ceftriaxone 2 g IM or IV QD for 10–14 days (CIII) | <p>Desensitization to penicillin might be a better option than ceftriaxone among penicillin-allergic patients with neurosyphilis (BIII)</p> <p>Combination of procaine penicillin and probenecid is not recommended for patients with history of sulfa allergy because these patients might be at risk for hypersensitivity reactions to probenecid</p> |

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| Candidiasis (mucosal) | <p>Oropharyngeal candidiasis Initial episodes (7–14 day treatment)</p> <ul style="list-style-type: none"> Fluconazole 100mg PO QD (AI); or Itraconazole oral solution 200 mg PO QD (AI); or Clotrimazole troches 10 mg PO 5 times daily (BII); or Nystatin suspension 4–6 mL QID or 1–2 flavored pastilles 4–5 times daily (BII) <p>Esophageal candidiasis (14–21 days)</p> <ul style="list-style-type: none"> Fluconazole 100 mg (up to 400 mg) PO or IV QD (AI); or Itraconazole oral solution 200 mg PO QD (AI) Voriconazole 200 mg PO BID (AII) Caspofungin 50 mg IV QD (AII) <p>Vulvovaginitis</p> <ul style="list-style-type: none"> Topical azoles (clotrimazole, butoconazole, miconazole, ticonazole, or terconazole) for 3–7 days (AII) Topical nystatin 100,000 units/day as vaginal tablet for 14 days (AII) Oral Itraconazole 200 mg BID for 1 day or 200 mg QD for 3 days (AII) Oral Fluconazole 150 mg for 1 dose (AII) | <p>Fluconazole-refractory oropharyngeal candidiasis</p> <ul style="list-style-type: none"> Itraconazole oral solution ≥ 200 mg PO QD (BII); or Amphotericin B suspension 100 mg/mL (not available in U.S.) – 1 mL PO QID (CII); or Amphotericin B deoxycholate 0.3 mg/kg IV QD (BII) <p>Fluconazole-refractory esophageal candidiasis</p> <ul style="list-style-type: none"> Caspofungin 50 mg IV QD (BIII); or Voriconazole 200 mg PO or IV BID (AII) Amphotericin B 0.3–0.7 mg/kg IV QD (BII); or Amphotericin liposomal or lipid complex 3–5 mg/kg IV QD (CIII) | <p>Suppressive therapy — generally not recommended (DIII) unless patients have frequent or severe recurrences</p> <ul style="list-style-type: none"> Oropharyngeal candidiasis fluconazole or itraconazole oral solution may be considered (CI). Vulvovaginal candidiasis – daily topical azole for recurrent cases (CII) Esophageal candidiasis fluconazole 100–200 mg QD (BI). Chronic or prolonged use of azoles might promote development of resistance |
| <i>Cryptococcus neoformans</i> meningitis | <p>Acute infection (induction therapy)</p> <ul style="list-style-type: none"> Amphotericin B deoxycholate 0.7 mg/kg body weight IV QD and/or flucytosine 25 mg/kg PO QID for 2 weeks (AI); or Liposomal Amphotericin B 4 mg/kg IV QD and/or flucytosine 25 mg/kg PO QID for 2 weeks (AI) <p>Consolidation therapy</p> <ul style="list-style-type: none"> Fluconazole 400 mg PO QD for 8 weeks or until CSF cultures are sterile (AI) <p>Chronic maintenance therapy (Secondary Prophylaxis)</p> <ul style="list-style-type: none"> Fluconazole 200 mg PO QD (AI); | <p>Induction therapy (alternative)</p> <ul style="list-style-type: none"> Amphotericin B 0.7 mg/kg/day IV for 2 weeks (BI); or Fluconazole 400–800 mg/day (PO or IV) for less severe disease Fluconazole 400–800 mg/day (PO or IV) and flucytosine 25 mg/kg PO QID for 4–6 weeks (BII) <p>Consolidation therapy (alternative)</p> <ul style="list-style-type: none"> Itraconazole 200 mg PO BID (BI) <p>Chronic maintenance therapy (alternative)</p> <ul style="list-style-type: none"> Itraconazole 200mg PO QD — for patients intolerance of or failed fluconazole (BI) | <p>Repeated lumbar puncture might be indicated as adjunctive therapy among patients with increased intracranial pressure (AII).</p> <p>Discontinuation of antifungal therapy can be considered among patients who remain asymptomatic, with CD4⁺ T-lymphocyte count >100–200 cells/μL for ≥ 6months (CIII)</p> <p>Some might consider performing a lumbar puncture before discontinuation of maintenance therapy</p> |
| <i>Histoplasma capsulatum</i> infections | <p>Severe disseminated</p> <p>Acute phase (3–10 days or until clinically improved)</p> <ul style="list-style-type: none"> Amphotericin B deoxycholate 0.7 mg/kg body weight IV QD (AI); or Liposomal amphotericin B 4 mg/kg IV QD (AI) <p>Continuation phase (12 weeks)</p> <ul style="list-style-type: none"> Itraconazole 200 mg capsule PO BID (AII) <p>Less severe disseminated</p> <ul style="list-style-type: none"> Itraconazole 200 mg capsule PO TID for 3 days, then 200 mg PO BID for 12 weeks (AII) <p>Meningitis</p> <ul style="list-style-type: none"> Amphotericin B deoxycholate or liposomal for 12–16 weeks (AII) <p>Chronic maintenance therapy (secondary prophylaxis)</p> <ul style="list-style-type: none"> Itraconazole capsule 200 mg PO QD (AI) | <p>Severe disseminated Acute Phase (alternative)</p> <ul style="list-style-type: none"> Itraconazole 400 mg IV QD (BIII) <p>Continuation phase alternatives</p> <ul style="list-style-type: none"> Itraconazole oral solution 200 mg PO BID (BIII) Fluconazole 800 mg PO QD (CII) <p>Mild disseminated</p> <ul style="list-style-type: none"> Fluconazole 800 mg PO QD (CII) | <p>Acute pulmonary histoplasmosis among HIV-1–infected patients with CD4⁺ T-lymphocyte count >500 cells/μL might require no therapy (AIII).</p> <p>Insufficient data to recommend discontinuation of chronic maintenance therapy.</p> |

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| Coccidioidomycosis | <p>Nonmeningeal infection <i>Acute phase (diffuse pulmonary or disseminated disease)</i></p> <ul style="list-style-type: none"> Amphotericin B deoxycholate 0.5–1.0 mg/kg body weight IV QD continue until clinical improvement, usually 500–1,000 mg total dose (AII) <p><i>Acute phase (milder disease)</i></p> <ul style="list-style-type: none"> Fluconazole 400–800 mg PO QD (BIII); or Itraconazole 200 mg PO BID (BIII) <p>Meningeal Infections</p> <ul style="list-style-type: none"> Fluconazole 400–800 mg IV or PO QD (AII) <p>Chronic Maintenance Therapy (Secondary prophylaxis)</p> <ul style="list-style-type: none"> Fluconazole 400 mg PO QD (AII); or Itraconazole 200 mg capsule PO BID (AII) | <p>Nonmeningeal infection <i>Acute phase (diffuse pulmonary or disseminated disease)</i></p> <ul style="list-style-type: none"> Some specialists add azole to amphotericin B therapy (BIII) <p>Meningeal infections</p> <ul style="list-style-type: none"> Intrathecal Amphoterin B (CIII) | Insufficient data to recommend discontinuation of chronic maintenance therapy |
| Invasive aspergillosis | <p>Voriconazole 400 mg IV or PO q12h for 2 days, then 200 mg q12h (AIII)</p> <p>Duration of therapy Based on clinical response</p> | <ul style="list-style-type: none"> Amphotericin B deoxycholate 1 mg/kg body weight/day IV (AIII); or Lipid formulations of amphotericin B 5 mg/kg/day IV (AIII) | Not enough data to recommend chronic suppression or maintenance therapy (CIII) |
| Cytomegalovirus (CMV) disease | <p>CMV Retinitis <i>For immediate sight-threatening lesions</i> Ganciclovir (GCV) intraocular implant and valganciclovir 900 mg PO QD (AI)</p> <p><i>For peripheral lesions</i> Valganciclovir 900 mg PO BID for 14–21 days, then 900 mg PO QD (AII)</p> <p><i>Chronic maintenance therapy</i> (Secondary Prophylaxis) First choice</p> <ul style="list-style-type: none"> Valganciclovir 900 mg PO QD (BI) Foscarnet 90–120 mg/kg body weight IV QD (AI) <p>CMV esophagitis or colitis</p> <ul style="list-style-type: none"> Ganciclovir IV or Foscarnet IV for 21–28 days or until signs and symptoms have resolved (BII); oral valganciclovir may be used if symptoms are not severe enough to interfere with oral absorption (BII) Maintenance therapy is generally not necessary, but should be considered after relapses (BII) <p>CMV pneumonitis</p> <ul style="list-style-type: none"> Treatment should be considered in patients with histologic evidence of CMV pneumonitis and who do not respond to treatment of other pathogens (AIII) The role of maintenance therapy is not yet established (CIII) <p>CMV neurological disease</p> <ul style="list-style-type: none"> GCV IV and Foscarnet IV continue until symptomatic improvement (BII) Maintenance therapy should be continued for life (AI) | <p>CMV Retinitis</p> <ul style="list-style-type: none"> Ganciclovir 5 mg/kg IV q12h for 14–21 days, then 5 mg/kg IV QD (AI); or Ganciclovir 5 mg/kg IV q12h for 14–21 days, then Valganciclovir 900 mg PO QD (AI); or Foscarnet 60 mg/kg IV q8h or 90 mg/kg IV q12h for 14–21 days, then 90–120 mg/kg IV q24h (AI); or Cidofovir 5 mg/kg IV for 2 weeks, then 5 mg/kg every other weeks; each dose should be administered with IV saline hydration and oral probenecid (AI); or Repeated intravitreal injections with fomivirsen (for relapses only, not as initial therapy) (AI) <p>Chronic maintenance therapy</p> <ul style="list-style-type: none"> Cidofovir 5 mg/kg IV every other week with probenecid 2 g PO 3 hours before the dose followed by 1 g PO 2 hours after the dose, and 1 g by mouth 8 hours after the dose (total of 4 g) (AI); or Fomivirsen 1 vial (330 mg) injected into the vitreous, then repeated every 2–4 weeks (AI) | <p>Choice of initial therapy for CMV retinitis should be individualized on the basis of location and severity of the lesion(s), level of immunosuppression, and other factors such as concomitant medications and ability to adhere to treatment (AIII)</p> <p>Initial therapy among patients with CMV retinitis, esophagitis, colitis, and pneumonitis should include optimization of ART (BIII)</p> <p>Some specialists recommend delaying ART among patients with CMV neurological disease because of concerns about worsening of condition as a result of immune recovery inflammatory reaction (CIII)</p> <p>Pre-emptive treatment of patients with CMV viremia without evidence of organ involvement is generally not recommended (DIII).</p> <p>Maintenance therapy for CMV retinitis can be safely discontinued among patients with inactive disease and sustained CD4⁺ T lymphocyte (>100–150 cells/mm³ for ≥6 months); consultation with ophthalmologist is advised (BII)</p> <p>Patients with CMV retinitis who discontinued maintenance therapy should undergo regular eye examination for early detection of relapse (AIII).</p> <p>Ganciclovir intraocular implants might need to be replaced every 6–8 months for patients who remain immunosuppressed with CD4⁺ T lymphocyte counts <100–150 cells/μL</p> <p>Immune recovery uveitis (IRU) might develop in the setting of immune reconstitution; treatment of IRU; periocular corticosteroid or short courses of systemic steroid.</p> <p>Because of its poor oral bioavailability and with the availability of valganciclovir, oral ganciclovir should not be used (DIII)</p> |

TABLE 6. (Continued) Treatment of AIDS-associated opportunistic infections among adults

| Opportunistic infections | Preferred therapy and duration | Alternative therapy | Other options/issues |
|---|--|---|--|
| Herpes simplex virus (HSV) disease | <u>Orolabial lesions and initial or recurrent genital HSV</u> Famciclovir 500 mg PO BID or valaciclovir 1 g PO BID or acyclovir 400 mg PO TID for 7–14 days (AII) | <u>Acyclovir-resistant HSV</u> • Foscarnet 120–200 mg/kg/day IV in 2–3 divided doses until clinical response (A) • Cidofovir 5 mg/kg IV weekly until clinical response (AII) <u>Alternative for acyclovir-resistant HSV infections</u> • Topical trifluridine (CIII) • Topical cidofovir (CIII) Note: Neither of these topical preparations are commercially available; extemporaneous compounding of these topical products can be prepared using trifluridine ophthalmic solution and cidofovir for intravenous administration | Chronic suppressive therapy with oral acyclovir, famciclovir, or valaciclovir might be indicated among patients with frequent or severe recurrences (CIII) |
| | <u>Moderate-to-severe mucocutaneous HSV infections</u> • Initial therapy acyclovir 5 mg/kg body weight IV q8h (AII) • After lesions began to regress, change to famciclovir 500 mg PO BID or valaciclovir 1 g PO BID or acyclovir 400 mg PO TID (AII); continue therapy until lesions have completely healed | | |
| | <u>HSV keratitis</u> • Trifluridine 1% ophthalmic solution, one drop onto the cornea every 2 hours, not to exceed 9 drops per day, for no longer than 21 days (AII) <u>HSV encephalitis</u> • Acyclovir 10 mg/kg IV q8h for 14–21 days (AII) | | |
| Varicella zoster virus (VZV) disease | <u>Primary VZV infection (chickenpox)</u> • Acyclovir 10 mg/kg body weight IV q8h for 7–10 days (AIII) • Switch to oral therapy (acyclovir 800 mg PO QID or valaciclovir 1g TID or famciclovir 500 mg TID) after defervescence if no evidence of visceral involvement exists (AII) | | Corticosteroids for dermatomal zoster are not recommended (DIII) |
| | <u>Local dermatomal herpes zoster</u> • Famciclovir 500 mg or valaciclovir 1 g PO TID for 7–10 days (AII) | | |
| | <u>Extensive cutaneous lesion or visceral involvement</u> • Acyclovir 10 mg/kg IV q8h, continue until cutaneous and visceral disease clearly resolved (AII) | | |
| | <u>Progressive outer retinal necrosis (PORN)</u> • Acyclovir IV 10mg/kg q8h and foscarnet 60 mg/kg IV q8h (AIII) | | |
| | | | |
| Treatment of condyloma acuminata (genital warts) | | | |
| Human papillomavirus disease | Patient-applied treatment Podofilox 0.5% solution or 0.5% gel – apply to all lesions BID x 3 consecutive days, repeat weekly for up to 4 weeks (BIII) or Imiquimod 5% cream – apply to lesion at bedtime and remove in the morning on 3 nonconsecutive nights weekly for up to 16 weeks (BII) | Provider-applied treatment • Liquid nitrogen cryotherapy – apply until each lesion is thoroughly frozen, repeat every 1–2 weeks for up to 3–4 times (BIII) • Trichloroacetic acid or bichloroacetic acid cauterization 80%–95% aqueous solution, apply to each lesion, repeat weekly for 3–6 weeks (BII) • Surgical excision (BIII) or laser surgery (CIII) • Cidofovir topical (CIII) – not commercially available • Podophyllin resin 10%–25% suspension in tincture of benzoin – apply to area and wash off in a few hours, repeat weekly for up to 3–6 weeks (CIII) | Intralesional interferon-alfa generally not recommended because of high cost, difficult administration, and potential for systemic side effects (DIII) The rate of recurrence of genital warts is high despite treatment Data are limited on the responses to treatment among HIV-1–infected patients |

TABLE 6. (Continued) Treatment of AIDS-associated opportunistic infections among adults

| Opportunistic infections | Preferred therapy and duration | Alternative therapy | Other options/issues |
|---|---|--|---|
| Human papillomavirus disease (Continued) | Treatment of cervical intraepithelial neoplasia (CIN) or anal intraepithelial neoplasia (AIN) | | |
| | <p>CIN 1</p> <ul style="list-style-type: none"> Pap smears and/or colposcopy every 4–6 months CIN 2 or 3 Loop electrosurgical excision procedure (LEEP) (BIII) <p>AIN</p> <ul style="list-style-type: none"> Insufficient data to recommend specific treatment; treatment decision based on size, location of lesion and grade of histology (CIII) | <p>CIN 2 or 3</p> <ul style="list-style-type: none"> Cryotherapy (BIII) Laser therapy (BIII) Cone biopsy (BIII) | <p>Low-dose intravaginal 5-fluorouracil (2 g twice weekly for 6 months) for CIN might reduce short-term risk for recurrence (CIII)</p> <p>Efficacy of treatment of AIN-2 or 3 in preventing anal cancer is unknown</p> |
| Hepatitis C virus disease (HCV) | <p>Combination therapy (AI)</p> <p>Peginterferon alfa-2b (1.5 mcg/kg body weight) SQ weekly; or Peginterferon alfa-2a (180 mcg) SQ weekly and</p> <p>Ribavirin PO (weight-based dosing: if <75 kg, 400 mg in a.m. and 600 mg in p.m.; if >75 kg, 600 mg BID)</p> <p>Duration of therapy</p> <p><i>For genotype 1</i></p> <ul style="list-style-type: none"> 48 weeks — for patients who demonstrate an early virologic response (≥ 2 log decrease in HCV viral load at 12 weeks) (AI) 12 weeks — For patients who failed to achieve early virologic response at 12 weeks (BI); therapy beyond 12 weeks is almost always futile for achieving virologic cure <p><i>For genotype 2 or 3</i></p> <ul style="list-style-type: none"> 24 weeks — based on data in non-HIV-1–infected patients (BII) Some specialists recommend 48 weeks (CIII) | <p>In patients where ribavirin is contraindicated (e.g. unstable cardiopulmonary disease, pre-existing anemia or hemoglobinopathy):</p> <p>Peginterferon alfa-2b 1.5 mcg/kg or peginterferon alfa-2a 180 mcg SQ weekly (AII)</p> | <p>All patients should be counseled to avoid alcohol consumption because of increased risk for fibrosis progression</p> <p>Preliminary data suggest that responses to HCV therapy correlates to CD4⁺ cell count</p> <ul style="list-style-type: none"> Some suggest treating HCV before CD4⁺ drops below 500 cells/μL (BIII); Conversely, if patient has CD4⁺ <500 cells/μL, some suggest initiating ARV before treatment of HCV (BIII) <p>Patients should receive 2 doses of hepatitis A vaccine, preferably before CD4⁺ T-cell count drops below 200 cells/μL (BIII)</p> |
| Hepatitis B virus disease (HBV) | <p>Because of the lack of controlled trial data on the use of antiviral agents against HBV in HIV/HBV co-infected patients, none of the current therapy can be recommended as preferred regimen</p> <p>In patients with HIV/HBV/HCV co-infection, consideration for antiretroviral therapy should be the first priority; if antiretroviral therapy is not required, then treatment for HCV should be considered before HBV, as interferon treatment for HCV also might treat HBV infection (CIII)</p> | <p>Lamivudine-naïve patients requiring ART</p> <ul style="list-style-type: none"> Lamivudine 150 mg PO BID is commonly used as part of an ART regimen (BIII); some specialists advise adding adefovir 10 mg/day or tenofovir 300 mg/day to lamivudine (or emtricitabine) (CIII); or Adefovir 10 mg/day in addition to ART (BIII); or PEG IFN alfa 2a 180 mg SQ q week, or Interferon-alfa 2a or 2b 5 million units (MU) SQ QD or 10 MU SQ TIW (CIII)** <p>Duration of interferon alfa therapy</p> <p>HBeAg-positive patients – 16–24 weeks (BII)</p> <p>HBeAg-negative patients – minimum of 12 months (BIII)</p> <p>Lamivudine-experienced patients requiring ART</p> <ul style="list-style-type: none"> Tenofovir 300 mg PO QD as part of an ART regimen and/or lamivudine or emtricitabine (CIII) or Adefovir 10 mg PO QD and/or lamivudine or emtricitabine (CIII) <p>Lamivudine-naïve or lamivudine-experienced patients in whom ART is not indicated:</p> <p>Adefovir 10 mg PO QD (CIII) or PEG IFN alfa 2a 180 mcg SQ q week (CIII)</p> | <p>All patients should be advised to avoid or limit alcohol consumption (AIII)</p> <p>Patients should receive 2 doses of hepatitis A vaccine, preferably before CD4⁺ T-cell count drops below 200 cells/μL (BIII)</p> <p>Interferon should not be used among patients with decompensated liver disease (EII)</p> <p>Discontinuation of therapy for HBV infection risks flare of liver disease in approximately 15% of patients and lost of anti-HBV benefit</p> <p>HAART should always include HBV treatment to minimize immune reconstitution flares</p> |

TABLE 6. (Continued) Treatment of AIDS-associated opportunistic infections among adults

| Opportunistic infections | Preferred therapy and duration | Alternative therapy | Other options/issues |
|---|--|--|--|
| Penicilliosis | <u>Acute infection in severely ill patients</u> Amphotericin B 0.6 mg/kg body weight/day IV for 2 weeks; followed by itraconazole oral solution 400 mg daily for 10 weeks (AII) <u>Chronic maintenance therapy (Secondary prophylaxis)</u> Itraconazole 200 mg PO QD (AI) | | ART should be administered according to standard of care in the community (CIII) |
| Leishmaniasis | Pentavalent antimony (or sodium stibogluconate) = 20 mg/kg body weight IV or IM QD (AI) for 3–4 weeks; duration depends on initial response (CIII) <u>Chronic maintenance therapy (Secondary prophylaxis)</u> Single dose of the initial therapy every 4 weeks, especially in patients with CD4 ⁺ <200 cells/ μ L (AI) | <ul style="list-style-type: none"> Amphotericin B deoxycholate (AII) 0.5–1.0 mg/kg body weight IV QD (maximum: 50 mg QD) for total dose of 1.5–2.0 gm (BII); or Amphotericin B lipid formulation (AI) 2–5 mg/kg IV QD for 10 days (BII) there is less experience with shorter regimens; or Pentamidine isethionate 3–4 mg/kg IV TIW for 3–4 weeks followed by monthly maintenance therapy (BII) <u>Secondary prophylaxis</u> Single dose of the initial therapy every 4 weeks, especially in patients with CD4 ⁺ <200 cells/ μ L (AI) | Severely neutropenic patients with visceral leishmaniasis might benefit from short course of granulocyte macrophage colony stimulating factor (GM-CSF) 5 μ g/kg body weight/day SQ for 5 days (CII) <u>Alternative regimen for treatment failure</u> <ul style="list-style-type: none"> Miltefosine 100 mg PO QD for 4 weeks (CIII) Strong consideration should be given to initiation or optimization of ART (CIII) |
| Paracoccidioidomycosis | Amphotericin B for severely ill (BII) Itraconazole 100–200 mg PO QD for less ill (BII) | <ul style="list-style-type: none"> Ketoconazole 200–400 mg PO QD (BII) Sulfonamide (BIII) | Potent ART should be initiated in accordance with standards of care in the community (AIII) |
| <i>Isospora belli</i> infection | TMP 160 mg and SMX 800 mg PO (or IV) QID for 10 days (AII) or TMP 320 mg and SMX 1600 mg PO (or IV) BID for 10–14 days (AIII) <u>Chronic maintenance therapy (Secondary prophylaxis)</u> In patients with CD4 ⁺ <200, TMP 320 mg and SMX 1600 mg PO QD or TIW (AII) | <ul style="list-style-type: none"> Pyrimethamine 50–75 mg PO QD and Leucovorin 5–10 mg PO QD (BII); or Ciprofloxacin 500 mg PO BID (BII) Other fluoroquinolones (BII) <u>Alternative secondary prophylaxis</u> Pyrimethamine 25 mg PO QD and leucovorin (BII) | Fluid management among patients with dehydration (AIII) Nutritional supplementation for malnutrition and wasting (AIII) Immune reconstitution with ART might result in fewer relapse (AIII) Discontinuation of secondary prophylaxis may be considered among patients with sustained CD4 ⁺ T-cell count >200 cells/ μ L for >3 months (BII) |
| Chagas disease (American trypanosomiasis) | Benznidazole 5–8 mg/kg body weight/day in 2 divided doses for 30–60 days (AIII) <u>Chronic maintenance therapy (secondary prophylaxis)</u> Lifelong prophylaxis is probably indicated at same doses (CIII) | Nifurtimox (not available) 10 mg/kg/day (BIII). Lifelong secondary prophylaxis probably indicated at same doses (CIII) | |

ART = antiretroviral therapy; IM = intramuscular; IV = intravenous; PO = oral; SQ = subcutaneous; QD = daily; BID = twice a day; TID = three times daily; QID = four times a day; TIW = three times weekly; q'n'h = every 'n' hour.

* Pyrimethamine and leucovorin doses — same as in “preferred therapy” for toxoplasmosis.

† See Table 5 for rifabutin doses based on concomitant antiretroviral drug use.

§ Pyrazinamide dose: <55 kg = 1,000 mg; 56–75 kg = 1,500 mg; \geq 76 kg = 2,000 mg.

¶ Ethambutol dose: <55 kg = 800 mg; 56–75 kg = 1,200 mg; \geq 76 kg = 1,600 mg.

** Among HIV-HBV co-infected patients who do not need HIV therapy but who have HBeAg-positive chronic hepatitis B and ALT >2 times normal, certain authorities recommend treating HBV with interferon- α provided no evidence of hepatic decompensation exists. This strategy spares the patient from developing HIV and HBV resistance to lamivudine therapy and from the toxicity of ART.