

**Table 1. Primary Prophylaxis of Opportunistic Infections in Children with and Exposed to HIV—
Summary of Recommendations**

Updated: September 14, 2023

Reviewed: September 14, 2023

Indication	First Choice	Alternative	Comments/Special Issues	Last Reviewed
Bacterial Infections (<i>S. pneumoniae</i> and other invasive bacteria)	<ul style="list-style-type: none"> • Pneumococcal, Meningococcal, and Hib vaccines • Intravenous immune globulin (400 mg/kg body weight every 2 to 4 weeks) 	TMP-SMX, 75/375 mg/m ² body surface area per dose by mouth twice daily	<p>See Figures 1 and 2 for detailed vaccines recommendations.</p> <p>Vaccines Routinely Recommended for Primary Prophylaxis. Additional Primary Prophylaxis Indicated for—</p> <ul style="list-style-type: none"> • Hypogammaglobulinemia (that is, IgG <400 mg/dL) <p>Criteria for Discontinuing Primary Prophylaxis</p> <ul style="list-style-type: none"> • Resolution of hypogammaglobulinemia <p>Criteria for Restarting Primary Prophylaxis</p> <ul style="list-style-type: none"> • Relapse of hypogammaglobulinemia 	November 6, 2013
Candidiasis	Not routinely recommended	N/A	N/A	January 31, 2019
Coccidioidomycosis	N/A	N/A	Primary prophylaxis not routinely indicated in children.	November 6, 2013
Cryptococcosis	Not recommended	Not recommended	N/A	November 6, 2013
Cryptosporidiosis	ARV therapy to avoid advanced immune deficiency	N/A	N/A	August 29, 2019

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Cytomegalovirus (CMV)	<ul style="list-style-type: none"> For older children who can receive adult dose (based on their BSA), valganciclovir tablets 900 mg orally once daily with food For children aged 4 months to 16 years, valganciclovir oral solution 50 mg/mL at dose in milligrams = 7 x BSA x CrCl (up to maximum CrCl of 150 mL/min/1.73 m²) orally once daily with food (maximum dose 900 mg/day) 	N/A	<p>Primary Prophylaxis Can Be Considered for—</p> <ul style="list-style-type: none"> CMV antibody positivity and severe immunosuppression (i.e., CD4 count <50 cells/mm³ in children age ≥6 years; CD4 percentage <5% in children age <6 years). <p>Criteria for Discontinuing Primary Prophylaxis</p> <ul style="list-style-type: none"> Age ≥6 years with CD4 count >100 cells/mm³ Age <6 years with CD4 percentage >10% <p>Criteria for Considering Restarting Primary Prophylaxis</p> <ul style="list-style-type: none"> Age ≥6 years with CD4 count <50 cells/mm³ Age <6 years with CD4 percentage <5% 	August 3, 2023
Giardiasis	ART to avoid advanced immunodeficiency	N/A	N/A	August 22, 2019
Hepatitis B Virus (HBV)	<ul style="list-style-type: none"> Hepatitis B vaccine Combination of hepatitis B immunoglobulin and hepatitis B vaccine to infants born to mothers with hepatitis B infection 	Hepatitis B immunoglobulin following exposure	<p>See Figures 1 and 2 for detailed vaccine recommendations.</p> <p>Primary Prophylaxis Indicated for—</p> <ul style="list-style-type: none"> All individuals who are not HBV infected <p>Criteria for Discontinuing Primary Prophylaxis</p> <ul style="list-style-type: none"> N/A <p>Criteria for Restarting Primary Prophylaxis</p> <ul style="list-style-type: none"> N/A 	November 6, 2013

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Hepatitis C Virus (HCV)	None	N/A	N/A	November 6, 2013
Herpes Simplex Virus Infections (HSV)	N/A	N/A	Primary prophylaxis not indicated	November 6, 2013
Histoplasmosis	N/A	N/A	<p>Primary Prophylaxis Indicated for—</p> <ul style="list-style-type: none"> Selected HIV-infected adults but not children <p>Criteria for Discontinuing Primary Prophylaxis</p> <ul style="list-style-type: none"> N/A <p>Criteria for Restarting Primary Prophylaxis</p> <ul style="list-style-type: none"> N/A 	November 6, 2013
Human Papillomavirus (HPV)	HPV vaccine	N/A	See Figures 1 and 2 for detailed vaccine recommendations.	November 6, 2013
Isosporiasis (Cystoisosporiasis)	There are no U.S. recommendations for primary prophylaxis of isosporiasis.	N/A	Initiation of ART to avoid severe immunodeficiency may reduce incidence; TMP-SMX prophylaxis may reduce incidence.	February 8, 2019
Malaria	<p>For Travel to Chloroquine-Sensitive Areas—</p> <ul style="list-style-type: none"> Chloroquine base 5 mg/kg body weight base by mouth, up to 300 mg once weekly (equivalent to 7.5 mg/kg body weight chloroquine phosphate). Start 1–2 weeks before leaving, take weekly while away, and then take once weekly for 4 weeks after returning home. 	N/A	<p>Recommendations are the same for HIV-infected and HIV-uninfected children. Please refer to the following website for the most recent recommendations based on region and drug susceptibility: https://www.cdc.gov/malaria/.</p> <p>For travel to chloroquine-sensitive areas. Equally recommended options include chloroquine, atovaquone/proguanil, doxycycline (for children aged ≥8 years), and mefloquine;</p>	November 6, 2013

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	<ul style="list-style-type: none"> • Atovaquone/proguanil once daily started 1–2 days before travel, for duration of stay, and then for 1 week after returning home <ul style="list-style-type: none"> ○ 11–20 kg; one pediatric tablet (62.5 mg/25 mg) ○ 21–30 kg, two pediatric tablets (125 mg/50 mg) ○ 31–40 kg; three pediatric tablets (187.5 mg/75 mg) ○ >40 kg; one adult tablet (250 mg/100 mg) • Doxycycline 2.2 mg/kg body weight (maximum 100 mg) by mouth once daily for children aged ≥8 years. Must be taken 1–2 days before travel, daily while away, and then up to 4 weeks after returning. • Mefloquine 5 mg/kg body weight orally given once weekly (maximum 250 mg) <p>For Areas with Mainly <i>P. Vivax</i>—</p> <ul style="list-style-type: none"> • Primaquine phosphate 0.6 mg/kg body weight base once daily by mouth, up to a maximum of 30 mg base/day. Starting 1 day before leaving, taken daily, and for 3–7 days after return <p>For Travel to Chloroquine-Resistant Areas—</p> <ul style="list-style-type: none"> • Atovaquone/proguanil once daily started 1–2 days before travel, for 		<p>primaquine is recommended for areas with mainly <i>P. vivax</i>.</p> <p>G6PD screening must be performed prior to primaquine use.</p> <p>Chloroquine phosphate is the only formulation of chloroquine available in the United States; 10 mg of chloroquine phosphate = 6 mg of chloroquine base.</p> <p>For travel to chloroquine-resistant areas, preferred drugs are atovaquone/proguanil, doxycycline (for children aged ≥8 years), or mefloquine.</p>	

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	<p>duration of stay, and then for 1 week after returning home</p> <ul style="list-style-type: none"> ○ 11–20 kg; one pediatric tablet (62.5 mg/25 mg) ○ 21–30 kg; two pediatric tablets (125 mg/50 mg) ○ 31–40 kg; three pediatric tablets (187.5 mg/75 mg) ○ >40 kg; one adult tablet (250 mg/100 mg) <ul style="list-style-type: none"> ● Doxycycline 2.2 mg/kg body weight (maximum 100 mg) by mouth once daily for children aged ≥8 years. Must be taken 1–2 days before travel, daily while away, and then up to 4 weeks after returning. ● Mefloquine 5 mg/kg body weight orally given once weekly (maximum 250 mg) 			
Microsporidiosis	N/A	N/A	Not recommended	December 14, 2016
<i>Mycobacterium avium</i> Complex (MAC)	<ul style="list-style-type: none"> ● Clarithromycin 7.5 mg/kg body weight (maximum 500 mg) orally twice daily, <i>or</i> ● Azithromycin 20 mg/kg body weight (maximum 1,200 mg) orally once weekly 	<ul style="list-style-type: none"> ● Azithromycin 5 mg/kg body weight (maximum 250 mg) orally once daily ● Children aged >5 years: rifabutin 300 mg orally once daily with food 	<p>Primary Prophylaxis Indicated for Children</p> <ul style="list-style-type: none"> ● Age <1 year: CD4 count <750 cells/mm³ ● Age 1 to <2 years: CD4 count <500 cells/mm³ ● Age 2 to <6 years: CD4 count <75 cells/mm³ ● Age ≥6 years: CD4 count <50 cells/mm³ <p>Criteria for Discontinuing Primary Prophylaxis</p>	January 8, 2019

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			<ul style="list-style-type: none"> • Do not discontinue in children age <2 years. • After ≥6 months of ART, and: • Age 2 to <6 years: CD4 count >200 cells/mm³ for >3 consecutive months • Age ≥6 years: CD4 count >100 cells/mm³ for >3 consecutive months <p>Criteria for Restarting Primary Prophylaxis</p> <ul style="list-style-type: none"> • Age 2 to <6 years: CD4 count <200 cells/mm³ • Age ≥6 years: CD4 count <100 cells/mm³ 	
<p><i>Mycobacterium tuberculosis</i></p> <p>Treatment of LTBI, Also Known as TB Preventive Therapy</p>	<p>Source Case Drug Susceptible</p> <ul style="list-style-type: none"> • Age 2 to <12 years <ul style="list-style-type: none"> ○ 12 weekly doses of isoniazid (25 mg/kg for children aged 2–12 years) and rifapentine (10–14.0 kg: 300 mg; 14.1–25.0 kg: 450 mg; 25.1–32.0 kg: 600 mg; 32.1–49.9 kg: 750 mg; ≥50.0 kg: 900 mg maximum) • Age ≥12 years <ul style="list-style-type: none"> ○ 12 doses of weekly isoniazid (15 mg/kg rounded up to the nearest 50 or 100 mg; 900 mg maximum) and rifapentine (10–14.0 kg: 300 mg; 14.1–25.0 kg: 450 mg; 25.1–32.0 kg: 600 mg; 32.1–49.9 kg: 750 mg; ≥50.0 kg: 900 mg maximum) <p>Source Case Drug Resistant</p>	<p>Rifampin 15–20 mg/kg (max 600 mg) daily for 4 months duration</p> <p><i>or</i></p> <p>Isoniazid 10–15 mg/kg (max 300 mg) daily and rifampin 15–20 mg/kg (maximum 600 mg/day) for 3 months duration</p> <p><i>or</i></p> <p>Isoniazid 10–15 mg/kg (max 300 mg) daily for 6–9 months</p>	<p>Indications</p> <ul style="list-style-type: none"> • Positive TST (TST ≥5 mm in children with HIV) or IGRA without previous TB treatment • Close contact with any infectious TB case (repeated exposures warrant repeated post-exposure prophylaxis) <p>Considerations</p> <ul style="list-style-type: none"> • TB disease must be excluded before starting treatment for latent TB infection. • Drug–drug interactions with ART should be considered for all rifamycin-containing alternatives. <p>Criteria for Discontinuing Prophylaxis</p> <ul style="list-style-type: none"> • Only with documented severe adverse event, such as hepatotoxicity, hypersensitivity, or 	<p>September 14, 2023</p>

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	<ul style="list-style-type: none"> For isoniazid-resistant source cases, daily rifampin 15–20 mg/kg (maximum 600 mg/day) for 4 months is recommended. For isoniazid- and rifampin-resistant (i.e., MDR-TB) source cases, consult a TB expert and local public health authorities. 		<p>other adverse drug reactions, which are rare in children and adolescents.</p> <p>Adjunctive Treatment</p> <ul style="list-style-type: none"> Pyridoxine 1–2 mg/kg body weight once daily (maximum 25–50 mg/day) with isoniazid; pyridoxine supplementation is recommended for exclusively breastfed infants and for children and adolescents on meat- and milk-deficient diets; children with nutritional deficiencies, including all children with HIV; and pregnant adolescents and adults. 	
<p><i>Pneumocystis jirovecii</i> Pneumonia</p>	<ul style="list-style-type: none"> TMP–SMX (Cotrimoxazole): Trimethoprim (2.5–5 mg/kg body weight/dose) with sulfamethoxazole (12.5–25 mg/kg body weight/dose twice per day). Dosing based on TMP component. The total daily dose should not exceed 320 mg trimethoprim and 1,600 mg sulfamethoxazole. Several dosing schemes have been used successfully: <ul style="list-style-type: none"> Given 3 days per week on consecutive days or on alternate days Given 2 days per week on consecutive days or on alternate days Given every day (total daily dose of TMP 5–10 mg/kg body weight given as a single dose each day) 	<p>Dapsone</p> <p><i>Children Aged ≥1 Months</i></p> <ul style="list-style-type: none"> 2 mg/kg body weight (maximum 100 mg) by mouth once daily or 4 mg/kg body weight (maximum 200 mg) by mouth once weekly <p>Atovaquone</p> <p><i>Children Aged 1–3 Months and >24 Months–12 Years</i></p> <ul style="list-style-type: none"> 30–40 mg/kg body weight/dose by mouth once daily with food <p><i>Children Aged 4–24 Months</i></p> <ul style="list-style-type: none"> 45 mg/kg body weight/dose by mouth once daily with food 	<p>Primary Prophylaxis Indicated for—</p> <ul style="list-style-type: none"> All HIV-infected or HIV-indeterminate infants from aged 4–6 weeks to 12 months regardless of CD4 cell count/percentage HIV-infected children aged 1 to <6 years with CD4 count <500 cells/mm³ or CD4 percentage <15%; HIV--infected children aged 6–12 years with CD4 count <200 cells/mm³ or CD4 percentage <15% <p>Criteria for Discontinuing Primary Prophylaxis</p> <p>Note: Do not discontinue in HIV-infected children aged <1 year</p> <p><i>After ≥6 Months of cART</i></p> <ul style="list-style-type: none"> Aged 1 to <6 years: CD4 percentage ≥15% or CD4 count is ≥500 cells/mm³ for >3 consecutive months, <i>or</i> 	<p>November 6, 2013</p>

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		<p><i>Children Aged ≥13 Years</i></p> <ul style="list-style-type: none"> 1,500 mg (10 cc oral yellow suspension) per dose by mouth once daily <p>Aerosolized Pentamidine</p> <p><i>Children Aged ≥5 Years</i></p> <ul style="list-style-type: none"> 300 mg every month via Respigard II™ nebulizer (manufactured by Marquest; Englewood, Colorado) 	<ul style="list-style-type: none"> Aged ≥6 years: CD4 percentage ≥15% or CD4 count is ≥200 cells/mm³ for >3 consecutive months <p>Criteria for Restarting Primary Prophylaxis</p> <ul style="list-style-type: none"> Aged 1 to <6 years with CD4 percentage <15% or CD4 count <500 cells/mm³ Aged ≥6 years with CD4 percentage <15% or CD4 count <200 cells/mm³ 	
Syphilis	N/A	N/A	<p>Primary Prophylaxis Indicated for—</p> <ul style="list-style-type: none"> N/A <p>Criteria for Discontinuing Primary Prophylaxis</p> <ul style="list-style-type: none"> N/A <p>Criteria for Restarting Primary Prophylaxis</p> <ul style="list-style-type: none"> N/A 	November 6, 2013
Toxoplasmosis	TMP-SMX, 150/750 mg/m ² body surface area once daily by mouth	<p>Children Aged ≥1 Month</p> <ul style="list-style-type: none"> Dapsone 2 mg/kg body weight or 15 mg/m² body surface area (maximum 25 mg) by mouth once daily, <i>plus</i> Pyrimethamine 1 mg/kg body weight (maximum 25 mg) by mouth once daily, <i>plus</i> 	<p>Primary Prophylaxis Indicated for—</p> <p><i>IgG Antibody to Toxoplasma and Severe Immunosuppression</i></p> <ul style="list-style-type: none"> HIV-infected children aged <6 years with CD4 percentage <15%; HIV-infected children aged ≥6 years with CD4 count <100 cells/mm³. <p>Criteria for Discontinuing Primary Prophylaxis</p>	November 6, 2013

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		<ul style="list-style-type: none"> • Leucovorin 5 mg by mouth every 3 days <p>Children Aged 1–3 Months and >24 Months</p> <ul style="list-style-type: none"> • Atovaquone 30 mg/kg body weight by mouth once daily <p>Children Aged 4–24 Months</p> <ul style="list-style-type: none"> • Atovaquone 45 mg/kg body weight by mouth once daily, with or without pyrimethamine 1 mg/kg body weight or 15 mg/m² body surface area (maximum 25 mg) by mouth once daily, <i>plus</i> • Leucovorin 5 mg by mouth every 3 days <p>Acceptable Alternative Dosage Schedules for TMP-SMX</p> <ul style="list-style-type: none"> • TMP-SMX 150/750 mg/m² body surface area per dose once daily by mouth three times weekly on 3 consecutive days per week • TMP-SMX 75/375 mg/m² body surface area per dose twice daily by mouth every day 	<p>Note: Do not discontinue in children aged <1 year</p> <ul style="list-style-type: none"> • After ≥6 months of cART, and • Aged 1 to <6 years: CD4 percentage is ≥15% for >3 consecutive months • Aged ≥6 years: CD4 count >200 cells/mm³ for >3 consecutive months <p>Criteria for Restarting Primary Prophylaxis</p> <ul style="list-style-type: none"> • Aged 1 to <6 years with CD4 percentage <15% • Aged ≥6 years with CD4 count <100 to 200 cells/mm³ 	

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		<ul style="list-style-type: none"> • TMP-SMX 75/375 mg/m² body surface area per dose twice daily by mouth three times weekly on alternate days 		
Varicella-Zoster Virus (VZV) Pre-exposure Prophylaxis	Varicella vaccine	N/A	See Figure 1 for detailed vaccine recommendations.	December 9, 2019
Varicella-Zoster Virus (VZV) Primary (Post-exposure) Prophylaxis	VariZIG 125 IU/10 kg body weight (maximum 625 IU) IM, administered ideally within 96 hours (potentially beneficial up to 10 days) after exposure	If VariZIG is not available, IVIG 400 mg/kg body weight, administered once should be considered. IVIG should ideally be administered within 96 hours of exposure. When passive immunization is not possible, some experts recommend prophylaxis with acyclovir 20 mg/kg body weight/dose (maximum dose acyclovir 800 mg) by mouth, administered four times a day for 7 days, beginning 7–10 days after exposure.	Primary Post-exposure Prophylaxis Indicated for— <ul style="list-style-type: none"> • Patients with substantial exposure to varicella or zoster who have no verified history of varicella or zoster, <i>or</i> who are seronegative for VZV on a sensitive specific antibody assay, <i>or</i> who lack evidence of vaccination. • Many experts limit the recommendation for passive immunization to varicella- or zoster-exposed children with HIV considered severely immunocompromised (i.e., in CDC Immunologic Category 3), especially if severely symptomatic (i.e., CDC Clinical Category C^a) and experiencing a high HIV RNA plasma viral load. • Some experts start acyclovir at first appearance of rash in children with HIV, rather than providing acyclovir as prophylaxis. 	December 9, 2019

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			<p>Note: VariZIG is commercially available in the United States from a broad network of specialty distributors.</p> <p>^a Centers for Disease Control and Prevention. Revised classification system for human immunodeficiency virus infection in children aged <13 years. Official authorized addenda: human immunodeficiency virus infection codes and official guidelines for coding and reporting ICD-9-CM. <i>MMWR Morb Mortal Wkly Rep.</i> 1994;43:1-19. Available at https://www.cdc.gov/mmwr/PDF/rr/rr4312.pdf.</p>	

Key to Acronyms: ART = antiretroviral therapy; BSA = body surface area; cART = combination antiretroviral therapy; CD4 = CD4 T lymphocyte; CDC = Centers for Disease Control and Prevention; CMV = cytomegalovirus; CrCl = creatinine clearance; FDA = Food and Drug Administration; HBV = hepatitis B virus; HCV = hepatitis C virus; HPV = human papillomavirus; HSV = herpes simplex virus; IgG = immunoglobulin G; IGRA = interferon-gamma release assay; IVIG = intravenous immunoglobulin; LTBI = latent TB infection; MDR-TB = multidrug-resistant TB; QID = four times a day; TB = tuberculosis; TMP-SMX = trimethoprim-sulfamethoxazole; TST = tuberculin skin test; VZV = varicella-zoster virus