



Guidelines for the Use of Antiretroviral Agents in Adults and Adolescents Living with HIV

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Appendix B, Table 1. Characteristics of Nucleoside Reverse Transcriptase Inhibitors (Last updated October 25, 2018; last reviewed October 25, 2018) (page 1 of 6)

Generic Name (Abbreviation) Trade Name	Formulations	Dosing Recommendations ^a	Elimination/ Metabolic Pathway	Serum/ Intracellular Half-Lives	Adverse Events ^b
Abacavir (ABC) <i>Ziagen</i> Note: Generic tablet formulation is available.	<u>Ziagen:</u> • 300 mg tablet • 20 mg/mL oral solution	<u>Ziagen:</u> • 600 mg once daily, or • 300 mg BID Take without regard to meals.	Metabolized by alcohol dehydrogenase and glucuronyl transferase Renal excretion of metabolites: 82%	1.5 hours/ 12–26 hours	<ul style="list-style-type: none"> • HSRs: Patients who test positive for HLA-B*5701 are at highest risk. HLA screening should be done before initiation of ABC. • For patients with a history of HSR, re challenge is not recommended. • Symptoms of HSR may include fever, rash, nausea, vomiting, diarrhea, abdominal pain, malaise, fatigue, or respiratory symptoms such as sore throat, cough, or shortness of breath. • Some cohort studies suggest increased risk of MI with recent or current use of ABC, but this risk is not substantiated in other studies.
(ABC/3TC) <i>Epzicom</i> Note: Generic formulation is available.	<u>Epzicom:</u> • (ABC 600 mg plus 3TC 300 mg) tablet	<u>Epzicom:</u> • 1 tablet once daily	Dose adjustment for ABC is recommended in patients with hepatic insufficiency (see Appendix B, Table 8).		
(ABC/DTG/3TC) <i>Triumeq</i>	<u>Triumeq:</u> • (ABC 600 mg plus 3TC 300 mg plus DTG 50 mg) tablet	<u>Triumeq:</u> • 1 tablet once daily			
(ABC/ZDV/3TC) <i>Trizivir</i> Note: Generic formulation is available.	<u>Trizivir:</u> • (ABC 300 mg plus ZDV 300 mg plus 3TC 150 mg) tablet	<u>Trizivir:</u> • 1 tablet BID			
Didanosine (ddl) <i>Videx</i> <i>Videx EC</i> Note: Generic is available as delayed-release capsules; dose is the same as Videx EC.	<u>Videx EC:</u> • 125, 200, 250, and 400 mg capsules <u>Videx:</u> • 10 mg/mL oral solution	<u>Body Weight ≥60 kg:</u> • ddl 400 mg once daily <u>With TDF:</u> • ddl 250 mg once daily <u>Body Weight <60 kg:</u> • ddl 250 mg once daily <u>With TDF:</u> • ddl 200 mg once daily Take 1/2 hour before or 2 hours after a meal. Note: Preferred dosing with oral solution is BID (with the total daily dose divided into 2 doses).	Renal excretion: 50% Dose adjustment is recommended in patients with renal insufficiency (see Appendix B, Table 8).	1.5 hours/ >20 hours	<ul style="list-style-type: none"> • Pancreatitis • Peripheral neuropathy • Retinal changes, optic neuritis • Lactic acidosis with hepatic steatosis with or without pancreatitis (rare but potentially life-threatening toxicity) • Nausea, vomiting • Potential association with noncirrhotic portal hypertension; in some cases, patients presented with esophageal varices • One cohort study suggested increased risk of MI with recent or current use of ddl, but this risk is not substantiated in other studies. • Insulin resistance/diabetes mellitus

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Generic Name (Abbreviation) Trade Name	Formulations	Dosing Recommendations ^a	Elimination/ Metabolic Pathway	Serum/ Intracellular Half-Lives	Adverse Events ^b
Emtricitabine (FTC) <i>Emtriva</i>	<u>Emtriva:</u> • 200 mg hard gelatin capsule • 10 mg/mL oral solution	<u>Emtriva</u> <i>Capsule:</i> • FTC 200 mg once daily <i>Oral Solution:</i> • FTC 240 mg (24 mL) once daily Take without regard to meals.	Renal excretion: 86% Dose adjustment is recommended in patients with renal insufficiency (see Appendix B, Table 8).	10 hours/ >20 hours	<ul style="list-style-type: none"> Minimal toxicity Hyperpigmentation/skin discoloration Severe acute exacerbation of hepatitis may occur in HBV coinfecting patients who discontinue FTC.
(FTC/TAF) <i>Descovy</i>	<u>Descovy:</u> • (FTC 200 mg plus TAF 25 mg) tablet	<u>Descovy:</u> • 1 tablet once daily			
(FTC/TDF) <i>Truvada</i>	<u>Truvada:</u> • (FTC 200 mg plus TDF 300 mg) tablet	<u>Truvada:</u> • 1 tablet once daily			
(FTC/BIC/TAF) <i>Biktarvy</i>	<u>Biktarvy:</u> • (FTC 200 mg plus BIC 50 mg plus TAF 25 mg) tablet	<u>Biktarvy:</u> • 1 tablet once daily			
(FTC/DRV/c/TAF) <i>Symtuza</i>	<u>Symtuza:</u> • (FTC 200 mg plus DRV 800 mg plus COBI 150 mg plus TAF 10 mg) tablet	<u>Symtuza:</u> • 1 tablet once daily with food			
(FTC/EFV/TDF) <i>Atripla</i>	<u>Atripla:</u> • (FTC 200 mg plus EFV 600 mg plus TDF 300 mg) tablet	<u>Atripla:</u> • 1 tablet once daily on an empty stomach, preferably at bedtime			
(FTC/EVG/c/TAF) <i>Genvoya</i>	<u>Genvoya:</u> • (FTC 200 mg plus EVG 150 mg plus COBI 150 mg plus TAF 10 mg) tablet	<u>Genvoya:</u> • 1 tablet once daily with food			
(FTC/EVG/c/TDF) <i>Stribild</i>	<u>Stribild:</u> • (FTC 200 mg plus EVG 150 mg plus COBI 150 mg plus TDF 300 mg) tablet	<u>Stribild:</u> • 1 tablet once daily with food			
(FTC/RPV/TDF) <i>Complera</i>	<u>Complera:</u> • (FTC 200 mg plus RPV 25 mg plus TDF 300 mg) tablet	<u>Complera:</u> • 1 tablet once daily with a meal			

Appendix B, Table 1. Characteristics of Nucleoside Reverse Transcriptase Inhibitors (Last updated October 25, 2018; last reviewed October 25, 2018) (page 3 of 6)

Generic Name (Abbreviation) Trade Name	Formulations	Dosing Recommendations ^a	Elimination/ Metabolic Pathway	Serum/ Intracellular Half-Lives	Adverse Events ^b
Lamivudine (3TC) <i>Epivir</i> Note: Generic is available.	<u>Epivir:</u> • 150 and 300 mg tablets • 10 mg/mL oral solution	<u>Epivir:</u> • 3TC 300 mg once daily, <i>or</i> • 3TC 150 mg BID	Renal excretion: 70% Dose adjustment in patients with renal insufficiency is recommended (see Appendix B, Table 8).	5–7 hours/ 18–22 hours	• Minimal toxicity • Severe acute exacerbation of hepatitis may occur in HBV coinfecting patients who discontinue 3TC.
(3TC/ABC) <i>Epzicom</i> Note: Generic is available.	<u>Epzicom:</u> • (3TC 300 mg plus ABC 600 mg) tablet	<u>Epzicom:</u> • 1 tablet once daily			
(3TC/TDF) <i>Cimduo</i>	<u>Cimduo:</u> • (3TC 300 mg plus TDF 300 mg) tablet	<u>Cimduo:</u> • 1 tablet once daily			
(3TC/ZDV) <i>Combivir</i> Note: Generic is available.	<u>Combivir:</u> • (3TC 150 mg plus ZDV 300 mg) tablet	<u>Combivir:</u> • 1 tablet BID			
(3TC/ABC/ZDV) <i>Trizivir</i> Note: Generic is available.	<u>Trizivir:</u> • (3TC 150 mg plus ZDV 300 mg plus ABC 300 mg) tablet	<u>Trizivir:</u> • 1 tablet BID			
(3TC/DOR/TDF) <i>Delstrigo</i>	<u>Delstrigo:</u> • (3TC 300 mg plus DOR 100 mg plus TDF 300 mg) tablet	<u>Delstrigo:</u> • 1 tablet once daily			
(3TC/DTG/ABC) <i>Triumeq</i>	<u>Triumeq:</u> • (3TC 300 mg plus ABC 600 mg plus DTG 50 mg) tablet	<u>Triumeq:</u> • 1 tablet once daily			
(3TC/EFV/TDF) <i>Symfi</i>	<u>Symfi:</u> • (3TC 300 mg plus EFV 600 mg plus TDF 300 mg) tablet	<u>Symfi:</u> • 1 tablet once daily on an empty stomach, preferably at bedtime			
(3TC/EFV/TDF) <i>Symfi Lo</i>	<u>Symfi Lo:</u> • (3TC 300 mg plus EFV 400 mg plus TDF 300 mg) tablet	<u>Symfi Lo:</u> • 1 tablet once daily on an empty stomach, preferably at bedtime			

Appendix B, Table 1. Characteristics of Nucleoside Reverse Transcriptase Inhibitors (Last updated October 25, 2018; last reviewed October 25, 2018) (page 4 of 6)

Generic Name (Abbreviation) Trade Name	Formulations	Dosing Recommendations ^a	Elimination/ Metabolic Pathway	Serum/ Intracellular Half-Lives	Adverse Events ^b
Stavudine (d4T) <i>Zerit</i> Note: Generic is available.	<u>Zerit:</u> • 15, 20, 30, and 40 mg capsules • 1 mg/mL oral solution	<u>Body Weight ≥60 kg:</u> • d4T 40 mg BID <u>Body Weight <60 kg:</u> • d4T 30 mg BID Take without regard to meals. Note: WHO recommends 30 mg BID dosing regardless of body weight.	Renal excretion: 50% Dose adjustment is recommended in patients with renal insufficiency (see Appendix B, Table 8).	1 hour/ 7.5 hours	<ul style="list-style-type: none"> Peripheral neuropathy Lipoatrophy Pancreatitis Lactic acidosis/severe hepatomegaly with hepatic steatosis (rare but potentially life-threatening toxicity) Hyperlipidemia Insulin resistance/diabetes mellitus Rapidly progressive ascending neuromuscular weakness (rare)
Tenofovir Alafenamide (TAF) <i>Vemlidy</i> Note: Available as a 25-mg tablet for the treatment of HBV.	See FDCs for HIV treatment below.	See FDCs for HIV treatment below.	Metabolized by cathepsin A. Not recommended in patients with CrCl <30 mL/min.	0.5 hours/ 150–180 hours	<ul style="list-style-type: none"> Renal insufficiency, Fanconi syndrome, proximal renal tubulopathy are less likely to occur with TAF than with TDF. Osteomalacia, decrease in bone mineral density are less likely to occur with TAF than with TDF. Severe acute exacerbation of hepatitis may occur in HBV coinfecting patients who discontinue TAF. Diarrhea, nausea, headache
(FTC/TAF) <i>Descovy</i>	<u>Descovy:</u> • (FTC 200 mg plus TAF 25 mg) tablet	<u>Descovy:</u> • 1 tablet once daily			
(TAF/BIC/FTC) <i>Biktarvy</i>	<u>Biktarvy:</u> • (TAF 25 mg plus BIC 50 mg plus FTC 200 mg) tablet	<u>Biktarvy:</u> • 1 tablet once daily			
(TAF/DRV/c/FTC) <i>Symtuza</i>	<u>Symtuza:</u> • (TAF 10 mg plus DRV 800 mg plus COBI 150 mg plus FTC 200 mg) tablet	<u>Symtuza:</u> • 1 tablet once daily with food			
(TAF/EVG/c/FTC) <i>Genvoya</i>	<u>Genvoya:</u> • (TAF 10 mg plus EVG 150 mg plus COBI 150 mg plus FTC 200 mg) tablet	<u>Genvoya:</u> • 1 tablet once daily with food			
(TAF/RPV/FTC) <i>Odefsey</i>	<u>Odefsey:</u> • (TAF 25 mg plus RPV 25 mg plus FTC 200 mg) tablet	<u>Odefsey:</u> • 1 tablet once daily with a meal			

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Generic Name (Abbreviation) Trade Name	Formulations	Dosing Recommendations ^a	Elimination/ Metabolic Pathway	Serum/ Intracellular Half-Lives	Adverse Events ^b
Tenofovir Disoproxil Fumarate (TDF) <i>Viread</i> Note: Generic is available.	<u>Viread:</u> <ul style="list-style-type: none"> • 150, 200, 250, and 300 mg tablets • 40 mg/g oral powder <u>Generic:</u> <ul style="list-style-type: none"> • 300 mg tablet 	<u>Viread:</u> <ul style="list-style-type: none"> • TDF 300 mg once daily, <i>or</i> • 7.5 level scoops of oral powder once daily (dosing scoop dispensed with each prescription; 1 level scoop contains 1g of oral powder). • Take without regard to meals. Mix oral powder with 2–4 ounces of a soft food that does not require chewing (e.g., applesauce, yogurt). Do not mix oral powder with liquid.	Renal excretion is primary route of elimination. Dose adjustment is recommended in patients with renal insufficiency (see Appendix B, Table 8).	17 hours/ >60 hours	<ul style="list-style-type: none"> • Renal insufficiency, Fanconi syndrome, proximal renal tubulopathy • Osteomalacia, decrease in bone mineral density • Severe acute exacerbation of hepatitis may occur in HBV-coinfected patients who discontinue TDF. • Asthenia, headache, diarrhea, nausea, vomiting, and flatulence
(TDF/3TC) <i>Cimduo</i>	<u>Cimduo:</u> • (TDF 300 mg plus 3TC 300 mg) tablet	<u>Cimduo:</u> • 1 tablet once daily			
(TDF/FTC) <i>Truvada</i>	<u>Truvada:</u> • (TDF 300 mg plus FTC 200 mg) tablet	<u>Truvada:</u> • 1 tablet once daily • Take without regard to meals.			
(TDF/DOR/3TC) <i>Delstrigo</i>	<u>Delstrigo:</u> • (TDF 300 mg plus DOR 100 mg plus 3TC 300 mg) tablet	<u>Delstrigo:</u> • 1 tablet once daily			
(TDF/EFV/FTC) <i>Atripla</i>	<u>Atripla:</u> • (TDF 300 mg plus EFV 600 mg plus FTC 200 mg) tablet	<u>Atripla:</u> • 1 tablet once daily on an empty stomach, preferably at bedtime			
(TDF/EFV/3TC) <i>Symfi</i>	<u>Symfi:</u> • (TDF 300 mg plus EFV 600 mg plus 3TC 300 mg) tablet	<u>Symfi:</u> • 1 tablet once daily on an empty stomach, preferably at bedtime			
(TDF/EFV/3TC) <i>Symfi Lo</i>	<u>Symfi Lo:</u> • (TDF 300 mg plus EFV 400 mg plus 3TC 300 mg) tablet	<u>Symfi Lo:</u> • 1 tablet once daily on an empty stomach, preferably at bedtime			
(TDF/EVG/c/FTC) <i>Stribild</i>	<u>Stribild:</u> • (TDF 300 mg plus EVG 150 mg plus COBI 150 mg plus FTC 200 mg) tablet	<u>Stribild:</u> • 1 tablet once daily • Take with food.			
(TDF/RPV/FTC) <i>Complera</i>	<u>Complera:</u> • (TDF 300 mg plus RPV 25 mg plus FTC 200 mg) tablet	<u>Complera:</u> • 1 tablet once daily • Take with a meal.			

Appendix B, Table 1. Characteristics of Nucleoside Reverse Transcriptase Inhibitors (Last updated October 25, 2018; last reviewed October 25, 2018) (page 6 of 6)

Generic Name (Abbreviation) Trade Name	Formulations	Dosing Recommendations ^a	Elimination/ Metabolic Pathway	Serum/ Intracellular Half-Lives	Adverse Events ^b
Zidovudine (ZDV) <i>Retrovir</i> Note: Generic is available.	<u>Retrovir:</u> <ul style="list-style-type: none"> • 100 mg capsule • 300 mg tablet (only available as generic) • 10 mg/mL intravenous solution • 10 mg/mL oral solution 	<u>Retrovir:</u> <ul style="list-style-type: none"> • ZDV 300 mg BID, <i>or</i> • ZDV 200 mg TID • Take without regard to meals. 	Metabolized to GAZT Renal excretion of GAZT Dose adjustment is recommended in patients with renal insufficiency (see Appendix B, Table 8).	1.1 hours/ 7 hours	<ul style="list-style-type: none"> • Bone marrow suppression: macrocytic anemia or neutropenia • Nausea, vomiting, headache, insomnia, asthenia • Nail pigmentation • Lactic acidosis/severe hepatomegaly with hepatic steatosis (rare but potentially life-threatening toxicity) • Hyperlipidemia • Insulin resistance/diabetes mellitus • Lipoatrophy • Myopathy
(ZDV/3TC) <i>Combivir</i> Note: Generic is available.	<u>Combivir:</u> <ul style="list-style-type: none"> • (ZDV 300 mg plus 3TC 150 mg) tablet 	<u>Combivir:</u> <ul style="list-style-type: none"> • 1 tablet BID • Take without regard to meals. 			
(ZDV/3TC/ABC) <i>Trizivir</i> Note: Generic is available.	<u>Trizivir:</u> <ul style="list-style-type: none"> • (ZDV 300 mg plus 3TC 150 mg plus ABC 300 mg) tablet 	<u>Trizivir:</u> <ul style="list-style-type: none"> • 1 tablet BID • Take without regard to meals. 			

^a For dose adjustments in patients with renal or hepatic insufficiency, see [Appendix B, Table 8](#).

^b Also see [Table 15](#).

Key to Acronyms: 3TC = lamivudine; ABC = abacavir; **BIC = bictegravir**; BID = twice daily; COBI = cobicistat; CrCl = creatinine clearance; d4T = stavudine; ddl = didanosine; **DOR = doravirine**; DRV = darunavir; DTG = dolutegravir; EC = enteric coated; EFV = efavirenz; EVG = elvitegravir; FDC = fixed-dose combination; FTC = emtricitabine; GAZT = azidothymidine glucuronide; HBV = hepatitis B virus; HLA = human leukocyte antigen; HSR = hypersensitivity reaction; MI = myocardial infarction; RPV = rilpivirine; TAF = tenofovir alafenamide; TDF = tenofovir disoproxil fumarate; TID = three times a day; WHO = World Health Organization; ZDV = zidovudine