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SPECIAL THANKS TO:
Colorado AIDS Education and Training Center for medication images (images are not actual size and colors may vary) and www.poz.com for phonetic pronunciations.

Table 3. Antiretroviral Drugs, Regimens, or Components Not Recommended at Any Time	
Agent(s)	Comments
Antiretroviral Drugs Not Recommended	
Delavirdine (DLV) Didanosine (ddI) Indinavir (IDV) Nelfinavir (NFV) Stavudine (d4T)	Suboptimal potency, unacceptable toxicities, high pill burden, pharmacologic concerns
Antiretroviral Regimens Not Recommended	
Monotherapy (AI)	NRTI monotherapy inferior to dual-NRTI therapy; PI monotherapy inferior to combination ART; INSTI monotherapy has resulted in virologic rebound and INSTI resistance
Dual-NRTI Regimens (AI)	Inferior to triple-drug combination regimens
Triple-NRTI Regimens (AI)	Suboptimal virologic activity, lack of data
Antiretroviral Components Not Recommended	
ATV + IDV (AIII)	Potential for additive adverse effects (including hyperbilirubinemia and jaundice)
COBI + RTV as pharmacokinetic enhancers	Additive CYP3A4 enzyme inhibition and ↑ concentrations of ARVs or other concomitant medications
ddl + d4T (AII)	Peripheral neuropathy, pancreatitis, lactic acidosis, implicated in deaths of several pregnant women
ddl + TDF (AII)	↑ ddl levels, toxicities, immunologic nonresponse, early virologic failure, resistance
Two NNRTI Combinations (AI)	Excess clinical adverse events and treatment discontinuation; EFV and NVP are enzyme inducers and can ↓ ETR and RPV levels
FTC + 3TC (AIII)	Similar resistance profiles, minimal additive antiviral activity
ETR + unboosted PI (AII)	ETR may induce metabolism and ↓ unboosted PI levels
ETR + FPV/r (AII)	ETR may alter FPV concentration; appropriate doses not established
ETR + TPV/r (AII)	↓ ETR levels
NVP in ART-naïve ♀ with CD4 > 250 cells/mm ³ or ♂ with CD4 > 400 cells/mm ³ (BI)	↑ symptomatic, sometimes life-threatening, hepatic events
RTV as sole PI ⁵	Pill burden, GI intolerance, metabolic toxicities
Unboosted DRV, SQV, or TPV (AII)	Should only be used with low-dose RTV or COBI (DRV)
d4T + ZDV (AII)	Both thymidine analogs; antagonistic
TAF + TDF	No data supporting combination

5. The Guidelines list as "not recommended as part of initial therapy" but the editors of this resource do not recommend at any time.

ART in Adults & Adolescents



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This treatment guideline resource is a collaboration of the North and South Florida Southeast AETC partner sites

This resource summarizes critical information regarding antiretroviral agents approved for use in adults and adolescents such as adult dosing (including renal dosing recommendations), available dosage forms, side effects, and important patient (pt) counseling points. Unless otherwise noted, information is adapted from the Panel on Antiretroviral Guidelines for Adults and Adolescents. Guidelines for the Use of Antiretroviral Agents in Adults and Adolescents Living with HIV. Department of Health and Human Services. Last updated December 18, 2019. Available at: <https://aidsinfo.nih.gov/guidelines/html/1/adult-and-adolescent-arv/0>. Accessed January 5, 2020.

The information contained in this publication is intended for medical professionals, as a quick reference to the national guidelines. This resource does not replace nor represent the comprehensive nature of the published guidelines. Recognizing the rapid changes that occur in this field, clinicians are encouraged to consult with their local experts or research the literature for the most up-to-date information to assist with individual treatment decisions for their patient. If your patient should experience a serious adverse event, please report the event to the FDA (www.fda.gov/Safety/MedWatch/HowToReport/default.htm) to help increase patient safety.

Definition of Symbols
G = Generic Available
= Take with food = Take without food = Take with or without food
OC = Interaction with Oral Contraceptives. See Table 3 in Recommendations for the Use of Antiretroviral Drugs in Pregnant Women with HIV Infection and Interventions to Reduce Perinatal HIV Transmission in the United States
H = Hepatic Adjustment See DHHS Guidelines (Appendix B, Table 10) for recommendations for dosing ART in pts with hepatic insufficiency.
R = Renal Adjustment (See table)
TB = See Treatment of Tuberculosis (TB) in Adults with HIV Infection treatment guideline resource for drug interactions. Located at www.seaetc.com/reference
◆ = Dosage in photo, when multiple dosage forms are available
Note: Medication images are NOT actual size, and colors may vary.

Information on crushing and liquid ART formulations available at http://www.hivclinic.ca/main/drugs_extra_files/Crushing%20and%20Liquid%20ARV%20Formulations.pdf

Table 4. Renal Dose Adjustments ⁶	
Renal dosage adjustments are required for didanosine and stavudine. The clinician is encouraged to consider alternative regimen options in any pts on either of these agents. See prescribing information if renal dosing is necessary.	
Agent(s)	Dose Adjustment
NRTIs	
Emtricitabine	CrCL 30-49: 200 mg cap every 48 hours; CrCL 15-29: 200 mg cap every 72 hours; CrCL < 15: 200 mg cap every 96 hours HD ⁷ : 200 mg every 24 hours See guidelines for oral soln dosing
Lamivudine	CrCL 30-49: 150 mg every 24 hours; CrCL 15-29: 150 mg x 1 then 100 mg every 24 hours; CrCL 5-14: 150 mg x 1 then 50 mg every 24 hours; CrCL < 5 or HD ⁷ : 50 mg x 1 then 25 mg every 24 hours
Tenofovir alafenamide ⁸	CrCL < 15 and not on HD: Not recommended On HD ⁷ : One tablet once daily
Tenofovir disoproxil fumarate ⁹	CrCL 30-49: 300 mg every 48 hours; CrCL 10-29: 300 mg twice weekly every 72-96 hours; CrCL < 10 and not on HD: no recommendation; HD ⁷ : 300 mg every week (assumes 3 HD sessions per week of approximately 4 hours each)
Zidovudine	CrCL < 15 or HD ⁷ : 100 mg tid or 300 mg every 24 hours
NNRTIs	
Nevirapine	HD: Give extra 200 mg dose following each HD
Rilpivirine ¹⁰	Severe renal impairment or HD: use with caution and monitor for adverse effects
PIs	
Atazanavir (ATV)	ART-naïve on HD: ATV 300 mg + RTV 100 mg once daily; ART-experienced (exp) on HD: ATV not recommended (unboosted or boosted)
Lopinavir/r	HD: Avoid once daily dosing
INSTI	
Dolutegravir ¹¹	Use with caution in INSTI-exp pts with severe renal impairment and certain INSTI resistance mutations or suspected resistance as DTG levels may be decreased
CCR5 Inhibitor	
Maraviroc	CrCL < 30 or HD: With potent CYP3A inhibitor or inducer: not recommended Without potent CYP3A inhibitor or inducer: 300 mg PO bid (↓ to 150 mg PO bid if postural hypotension occurs)
Pharmacokinetic Enhancers	
Cobicistat	CrCL < 70: ATV/c or DRV/c use with TDF not recommended

6. No renal dose adj for abacavir, PIs (except ATV, lopinavir/r), NNRTIs, dolutegravir, raltegravir, or T20.
7. Dose after hemodialysis (HD) on HD days.
8. CAUTION: consider tenofovir alafenamide (TAF) as a possible cause for renal dysfunction. TAF as a single agent is available as Vemlidy[®] and is approved for HBV infection. Vemlidy[®] [package insert]. Foster City, CA: Gilead Sciences, Inc; Revised February 2019.
9. CAUTION: consider tenofovir disoproxil fumarate (TDF) or TAF as possible cause for renal dysfunction.
10. Edurant[®] [package insert]. Titusville, NJ: Janssen Pharmaceuticals, Inc; Revised May 2019.
11. Trivicya[®] [package insert]. Research Triangle Park, NC: ViiV Healthcare; Revised October 2019.
12. See DHHS Guidelines Drug-Drug Interactions section and www.hiv-druginteractions.org for additional information including statin interactions with NNRTIs. Generally no dosage adjustments needed but there may be decreased statin response depending on agents used.

Table 1. Regimens for Treatment of HIV-1 in Non-Pregnant Antiretroviral-Naïve Adults/Adolescents

Adapted from Table 6 of the Guidelines.
Regimens within classes are arranged by evidence rating and then alphabetical order. (r) indicates low-dose ritonavir and (c) indicates cobicistat for boosting.
See detailed information in this resource and in the Guidelines for dosing and other important points.
NOTE: Regimens below assume no baseline resistance. Resistance testing recommended for all pts upon entry into care. Consider repeat testing at the time of ART initiation if treatment is deferred.

Pregnancy & Perinatal Guidelines	
For pregnant woman or women with childbearing potential, see the Perinatal Guidelines for managing HIV infection in pregnancy including recommendations for prevention of mother to child transmission. https://aidsinfo.nih.gov/guidelines/html/3/perinatal-guidelines/0	
Recommended Initial Regimens for Most People with HIV	
Demonstrated durable virologic efficacy, favorable tolerability and toxicity profiles, and ease of use.	
INSTI + 2 NRTIs	
Bictegravir/tenofovir alafenamide (TAF)/emtricitabine (FTC) (AI) ¹	
Dolutegravir/abacavir/lamivudine - Only if HLA-B*5701 negative and without hepatitis B virus (HBV) coinfection (AI) ¹	
Dolutegravir + tenofovir ² /emtricitabine ³ (AI) ¹	
Raltegravir ⁴ + tenofovir ² /emtricitabine ³ (BI for TDF, BII for TAF) ¹	
INSTI + 1 NRTI	
Dolutegravir/lamivudine (AI) ¹	
- If HIV RNA < 500,000, no HBV coinfection, and genotype results showing no reverse transcriptase resistance	

Recommended Initial Regimens in Certain Clinical Situations:	
Effective/tolerable but have potential disadvantages compared to recommended regimens listed above, have limitations for use in certain patient populations, or have less randomized clinical trial data. May be preferred in some pts. See Table 7 Antiretroviral Regimen Considerations as Initial Therapy based on Specific Clinical Scenarios in the Guidelines for examples.	
INSTI + 2 NRTIs	
Elvitegravir/cobicistat/tenofovir ² /emtricitabine (BI) ¹	
Boosted PI + 2 NRTIs (Boosted darunavir [DRV] is preferred over boosted atazanavir [ATV])	
(Darunavir/c or Darunavir/r) + tenofovir ² /emtricitabine ³ (AI) ¹	
(Atazanavir/c or Atazanavir/r) + tenofovir ² /emtricitabine ³ (BI) ¹	
(Darunavir/c or Darunavir/r) + abacavir/lamivudine (3TC) - Only if HLA-B*5701 negative and no HBV coinfection (BII) ¹	
NNRTI + 2 NRTIs	
Doravirine/TDF/lamivudine (BI) ¹ or Doravirine + TAF ² /emtricitabine ³ (BIII) ¹	
Efavirenz (EFV) + tenofovir ² /emtricitabine ³ (BI for EFV 600 mg/TDF/FTC ³ and EFV 400 mg/TDF/3TC, BII for EFV 600 mg + TAF/FTC) ¹	
Rilpivirine/tenofovir ² /emtricitabine (BI)	
- If HIV RNA < 100,000 copies/mL and CD4 > 200 cells/mm³	
Regimens to Consider when Tenofovir ² or Abacavir Cannot be Used or Are Not Optimal	
Two-drug options should not be used in individuals with HBV coinfection or known pre-existing resistance to either ARV in the combination	
Dolutegravir/lamivudine (AI) ¹	
-If HIV RNA < 500,000	
Darunavir/r once daily + raltegravir twice daily - If HIV RNA < 100,000 copies/mL and CD4 > 200 cells/mm³ (C) ¹	
Darunavir/r once daily + lamivudine ³ (C) ¹	

Table 2. Initiation of ART While Awaiting Results of Resistance Testing and Other Labs	
ART should be started immediately, or as soon as possible, after diagnosis. If results of labs including renal and resistance tests are not available at the time of ART initiation, providers should consider starting one of the following regimens:	
<ul style="list-style-type: none"> Bictegravir/tenofovir alafenamide/emtricitabine (Darunavir/c or Darunavir/r) + tenofovir²/emtricitabine³ Dolutegravir + tenofovir²/emtricitabine³ 	

1. See Table 2 of DHHS Guidelines for rating scheme for strength of recommendations/quality of evidence.
2. Tenofovir alafenamide (TAF) and tenofovir disoproxil fumarate (TDF) are two FDA-approved forms of tenofovir. TAF has fewer bone and kidney toxicities and TDF is associated with lower lipid levels (unknown clinical significance). Consider safety, cost, and access when choosing between TAF and TDF. If initiating tenofovir without results of renal function tests, our editor recommendation is to use TAF rather than TDF.
3. Emtricitabine (FTC) may replace lamivudine (3TC) and vice versa (co-formulation is major determining factor).
4. Raltegravir can be dosed 400 mg bid (Isentress[®]) or 1200 mg once daily (two 600 mg tablets, Isentress[®] HD)

Renal Dosing for Combo Products	
Agent(s)	Dose Adjustment
EFV/FTC/TDF (Atripla) ⁹	CrCl < 50: not recommended. See dosing for individual agents
3TC/TDF (Cimduo [®] , Temixys [™]) ⁹	
ZDV/3TC (Combivir [®]) ⁹	
RPV/FTC/TDF (Complera [®]) ⁹	
ABC/3TC (Epzicom [®])	
DOR/3TC/TDF (Delstrigo [™]) ⁹	
DTG/3TC (Dovato [®])	
EFV/3TC/TDF (Symfi [™] and Symfi Lo [™]) ⁹	
DTG/ABC/3TC (Triumeq [™])	
ABC/ZDV/3TC (Trizivir [®])	
TAF/FTC (Descovy [™]) ⁹	CrCl < 30 and not on HD: not recommended CrCl < 30 and on HD ⁷ : one tablet daily
FTC/TDF (Truvada [™]) ⁹	CrCl 30-49: one tablet every 48 hours CrCl < 30: not recommended See dosing for individual agents
ATV/c (Evotaz [™]) ⁹	CrCl < 70: Use with TDF not recommended ART-exp on HD: ATV/c not recommended
DRV/c (Prezcobix [™]) ⁹	CrCl < 70: Use with TDF not recommended
BIC/FTC/TAF (Biktarvy [™]) ⁹	CrCl < 30: not recommended
DTG/RPV (Juluca [™]) ⁹	No dose adjustment necessary CrCl < 30: monitor closely for adverse effects
EVG/c/TAF/FTC (Genvoya [™]) ⁹	CrCl < 30 not on HD: not recommended HD ⁷ : one tablet daily.
RPV/FTC/TAF (Odefsey [™]) ⁹	
DRV/c/FTC/TAF (Symtuza [™]) ⁹	
EVG/c/FTC/TDF (Stribild [™]) ⁹	CrCl < 70 do not initiate CrCl < 50 not recommended
LPV/r (Kaletra [™]) ⁹	HD: avoid once daily dosing

Table 5. Statin Interactions with ART ¹²		
Protease Inhibitor (PI) Interactions		
NOTE: Interactions with indinavir, fosamprenavir, nelfinavir, saquinavir, and tipranavir are not included since these are rarely used		
Statin	Interactive PI(s)	Prescribing Recommendation
Atorvastatin	ATV, ATV/r	Titrate atorvastatin dose carefully (editors of this resource usually would not exceed 20 mg daily)
	ATV/c	Do not combine
	DRV/c, DRV/r, LPV/r	Titrate atorvastatin dose carefully (not to exceed 20 mg daily)
Fluvastatin	All HIV PIs	No data available
Lovastatin Simvastatin	All HIV PIs	CONTRAINDICATED
Pitavastatin	All HIV PIs	No dosage adjustments necessary
Pravastatin	ATV/c, ATV/r, DRV/c or DRV/r	Titrate pravastatin dose carefully while monitoring for toxicities
	LPV/r	No dosage adjustments necessary
	ATV/r, ATV/c, LPV/r	Titrate rosuvastatin dose carefully (not to exceed 10 mg daily)
Rosuvastatin	DRV/c, DRV/r	Titrate rosuvastatin dose carefully (not to exceed 20 mg daily)
	Stribild[®] (EVG/c/TDF/FTC) & Genvoya[®] (EVG/c/TAF/FTC) Interactions	
Statin	Interacting Agent	Prescribing Recommendation
Atorvastatin	cobicistat	Titrate atorvastatin dose carefully (not to exceed 20 mg daily)
Fluvastatin Pitavastatin Pravastatin	cobicistat	No data or dosage recommendation
Lovastatin Simvastatin	cobicistat	CONTRAINDICATED
Rosuvastatin	cobicistat	Titrate rosuvastatin dose carefully (editors of this resource usually would not exceed 20 mg daily)

NUCLEOSIDE/NUCLEOTIDE REVERSE TRANSCRIPTASE INHIBITORS (NRTIs)

Class adverse effects: Lactic acidosis and hepatic steatosis

Abacavir (Ziagen[®], ABC)
(uh-BACK-ah-veer)

Dosage form: 300 mg tab, 20 mg/mL soln (240 mL/bottle)
Also available in combination products: Epzicom[®], Trizivir[®], Triumeq[™]; see **Combination Products** for more detail

Adult and adolescent dose (weight ≥ 25 kg):
300 mg PO bid or 600 mg PO once daily

NOTE: Perform HLA-B*5701 test prior; only use if negative

Important Points:

- Use with caution in pts with ↑ CVD risk. Use with caution if pre-ART viral load >100,000 copies/mL unless combined with dolutegravir.
- Alcohol ↑ ABC levels 41%; potential for adverse effects
- AEs: Hypersensitivity reaction (2-9%), characterized by sign/symptom from ≥ 2 groups: G1: fever; G2: rash; G3: nausea, vomiting, diarrhea, or abdominal pain; G4: malaise, fatigue, or achiness; G5: dyspnea, cough, or pharyngitis (onset 4-6 weeks). Discontinue drug promptly and DO NOT RECHALLENGE!

Didanosine (Videx[®] EC, ddl)¹³
(dye-DAH-no-seen)

Rarely used. Adult/adolescent formulations will be removed from the market in 2020. Switch pts to another ARV.

13. See **Videx[®]** and **Videx EC[®]** Prescribing Information for dosage forms, dosing, adverse effects and other important points.

Emtricitabine (Emtriva[®], FTC)
(em-trih-SIGH-ta-been)

Dosage form: 200 mg cap, 10 mg/mL soln (170 mL/bottle)
Also available in combination products: Biktarvy[™], Symtuza[™], Truvada[™], Atripla[®], Complera[®], Descovy[™], Genvoya[™], Odefsey[™], Stribild[™]; see **Combination Products** for more detail

Adult and adolescent dose (weight ≥ 40 kg):
200 mg cap or 240 mg (24 mL) soln PO once daily

Important Points:

- Abrupt withdrawal can cause chronic active hep B flares
- AEs: Generally well-tolerated, ↑ pigmentation of palms/soles (> in black and Hispanic pts)
- Refrigerate soln or room temp if used within 3 months

Lamivudine (Epivir[®], 3TC)
(la-MI-vue-deen)

Dosage form: 150 mg, ♦300 mg tab, 10 mg/mL soln (240 mL)
Also available in combination products: Combivir[®], Cimduo[™], Delstrigo[™], Epzicom[®], Temixys[™], Symfi[™] and Symfi Lo[™]
Trizivir[®], Triumeq[™]; see **Combination Products** for more detail

Adult and adolescent dose (weight ≥ 25 kg):
300 mg PO once daily or 150 mg PO bid

Important Points:

- Abrupt withdrawal can cause chronic active hep B flares
- AEs: Generally well-tolerated

Stavudine (Zerit[®], d4T)¹⁴
(STA-vue-deen)

Rarely used. All formulations will be removed from the market in 2020. Switch pts to another ARV.

14. See **Zerit[®]** Prescribing Information for dosage forms, dosing, adverse effects and other important points.

