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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.

ART in Adults & Adolescents

AETC AIDS Education & Training Center Program Southeast

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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 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** (*CI*)[1]

Darunavir/r once daily + lamivudine[3] (*CI*)[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:

- Bictegravir/tenofovir alafenamide/emtricitabine
- (Darunavir/c **or** Darunavir/r) + tenofovir[2]/emtricitabine[3]
- Dolutegravir + tenofovir[2]/emtricitabine[3]

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)

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
ddI + d4T (*AII*)	Peripheral neuropathy, pancreatitis, lactic acidosis, implicated in deaths of several pregnant women
ddI + TDF (*AII*)	↑ ddI 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/mm3 or ♂ with CD4 > 400 cells/mm3 (*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.

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R 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. Tivicay® *[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.

R Renal Dosing for Combo Products

Agent(s)	Dose Adjustment
EFV/FTC/TDF (Atripla®)[9] 3TC/TDF (Cimduo™, Temixys™)[9] ZDV/3TC (Combivir®) 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®)	CrCl < 50: not recommended. See dosing for individual agents
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®)	CrCl < 70: Use with TDF not recommended ART-exp on HD: ATV/c not recommended
DRV/c (Prezcobix®)	CrCl < 70: Use with TDF not recommended
BIC/FTC/TAF (Biktarvy®)[9]	CrCl < 30: not recommended
DTG/RPV (Juluca®)	No dose adjustment necessary CrCl < 30: monitor closely for adverse effects
EVG/c/TAF/FTC (Genvoya®)[9] RPV/FTC/TAF (Odefsey®)[9] DRV/c/FTC/TAF (Symtuza™)[9]	CrCl < 30 not on HD: not recommended HD[7]: one tablet daily.
EVG/c/FTC/TDF (Stribild®)[9]	CrCl < 70 do not initiate CrCl < 50 not recommended
LPV/r (Kaletra®)	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
Rosuvastatin	ATV/r, ATV/c LPV/r	Titrate rosuvastatin dose carefully (not to exceed 10 mg daily)
	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) G H

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, ddI)[13]

(dye-DAH-no-seen) G R

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) R

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) G R

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) G R

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.

See Tables 20, 21 and 22 of the DHHS guidelines and *www.hiv-druginteractions.org* for drug interaction information before prescribing any ART regimen.

NRTIs (Continued)

Tenofovir alafenamide (Vemlidy®, TAF)
(ten-OH-foh-veer) (G) (R) (TB)

Dosage form: 25 mg tablet (approved for hepatitis B treatment)
Also available in combination products: Biktarvy®, Descovy®, Genvoya®, Odefsey®, Symtuza™
Adult dose: 1 tab PO once daily

Important Points:
- Document urine glucose and protein at baseline and perform routine monitoring (e.g., at least every 6 months) of eGFR
- Monitor serum phosphorus in pts with or at risk for renal impairment
- Abrupt withdrawal can cause chronic active hep B flares
- AEs: nausea, diarrhea, headache, renal insufficiency, decreased bone density (renal and bone issues less common and increases in cholesterol, LDL, Trigs, HDL more common than with tenofovir disoproxil fumarate)

Tenofovir Disoproxil Fumarate (Viread®, TDF)
(ten-OH-foh-veer) (G) [15] (R)

Nucleotide RTI

Dosage form: 150, 200, 250, ♦300 mg tab
40 mg/1 g oral powder (60 g multi-use bottle)
Also available in combination products: Cimduo™, Temixys™, Symfi™ and Symfi Lo™, Truvada®, Atripla®, Complera®, Delstrigo™, Stribild®; see **Combination Products** for more detail
Adult and adolescent[16] dose (weight ≥ 35 kg): 300 mg PO once daily

Important Points:
- Take tabs with or without food; take powder with food. Mix powder in ¼ - ½ cup of soft food (e.g., applesauce, baby food, yogurt) and take entire dose ASAP to avoid bad taste.
- Interacts with ATV (see ATV for dosing)
- Document urine glucose and protein at baseline and perform routine monitoring (at least every 6 months) of eGFR
- Monitor serum phosphorus in pts with or at risk for renal impairment
- Avoid TDF if concomitant or recent use of nephrotoxic agent
- Abrupt withdrawal can cause chronic active hep B flares
- Can decrease bone mineral density, consider calcium and vitamin D supplementation
- AEs: Flatulence, headache, diarrhea, nausea, vomiting, renal insufficiency, Fanconi Syndrome (rare), ↓ PO_4, osteopenia (rare, multifactorial)

15. Tabs are with or without food; powder is with food.
16. See the Guidelines for Use of Antiretroviral Agents in Pediatric HIV Infection for concerns about ↓ bone mineral density especially in pre-pubertal or early puberty (Tanner Stages 1 or 2)

Zidovudine (Retrovir®, AZT, ZDV)
(zye-DOE-vue-deen) (G) (R)

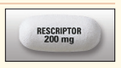
Dosage form: ♦300 mg tab, 100 mg cap, 10 mg/mL IV soln, 10 mg/mL syrup (240 mL/bottle)
Also available in combination products: Combivir®, Trizivir®; see **Combination Products** for more detail
Adult and adolescent dose (age ≥ 18 years): 300 mg PO bid or 200 mg PO tid

Important Points:
- AEs: Headache, nausea, ↑ pigmentation skin/nails, ↓ hemoglobin/hematocrit, ↓ WBC, ↑ MCV, myopathy

NON-NUCLEOSIDE REVERSE TRANSCRIPTASE INHIBITORS (NNRTIs)

Class adverse effects: rash (rarely Stevens-Johnson Syndrome), ↑ LFTs, many drug interactions.
See DHHS Guidelines and www.hiv-druginteractions.org.

Delavirdine (Rescriptor®, DLV)[17]
(deh-LAH-ver-deen) (H) (OC) (TB)



Rarely used

17. See Rescriptor® Prescribing Information for dosage forms, dosing, adverse effects and other important points.

Doravirine (Pifeltro™, DOR)
(Door-Ave-uh-reen) (H) (OC) (TB)

Dosage form: 100 mg tab
Also available in combination product: Delstrigo™; see **Combination Products** for more detail
Adult dose: 100 mg PO once daily

Important Points:
- AEs: nausea, dizziness, abnormal dreams

Efavirenz (Sustiva®, EFV)
(eh-FAH-vih-rehnz) (G) (H) (OC) (TB)

- Dosage form: 50, 200 mg cap, ♦600 mg tab
  Also available in combination products: Atripla®, Symfi™ and Symfi Lo™; see **Combination Products** for more detail

Adult and adolescent dose (weight ≥ 40 kg): 600 mg PO once daily at bedtime

Important Points:
- Take at bedtime without food to ↓ CNS side effects
- False positive cannabinoid or benzodiazepine test (usually on screening, confirmatory test should be negative)
- Use with caution in pts with psychiatric illness or using medications with neuropsych effects (CNS AEs more common)
- AEs: Drowsiness, dizziness, impaired concentration, insomnia, abnormal dreaming, agitation (Usually resolves in 2-4 weeks), depression, suicidal ideation (rare), hallucinations (rare), ↑ lipids , QT prolongation

Etravirine (Intelence®, ETR)[18]
(eh-truh-VIGH-reen) (H) (OC) (TB)

Rarely used

18. See Intelence® Prescribing Information for dosage forms, dosing, adverse effects and other important points.

Nevirapine (Viramune®, Viramune XR®, NVP)[19]
(nah-VAIR-ah-peen) (G) (H) (OC) (TB)

Rarely used

19. See Viramune and Viramune XR Prescribing Information for dosage forms, dosing, adverse effects and other important points.

Rilpivirine (Edurant®, RPV)
(ril-pih-VIGH-reen) (R) (H) (TB)

Dosage form: 25 mg tab
Also available in combination products: Complera® and Odefsey®; see **Combination Products** for more detail
Adult and adolescent dose[20] (weight ≥ 35 kg): 25 mg once daily

Important Points:
- Take with a meal (at least 400 kcal)
- Interacts with acid-reducing agents. See Table 6.
- Caution with drugs that prolong the QT interval
- AEs: Depression, insomnia, headache, rash

20. Not recommended in pts with pre-ART HIV RNA > 100,000 copies/mL or CD4 count < 200 cells/mm³ due to ↑ rate of virologic failure

Table 6. Rilpivirine Interactions with Acid-reducing Agents (ARAs)

ARA	Rilpivirine Dosing Recommendation
Antacids (e.g., Al, Mg, Ca)	Take antacids ≥ 2 hours before or ≥ 4 hours after RPV
H2-Receptor Antagonists	Take H2-Receptor antagonists ≥ 12 hours before or ≥ 4 hours after RPV
Proton Pump Inhibitors	**Do not combine-contraindicated**

PHARMACOKINETIC (PK) ENHANCERS

Cobicistat (Tybost®, COBI, /c)
(koe-BIK-i-stat) (R) (H) (OC) (TB)

Dosage form: 150 mg tab
Mostly in combination products: Evotaz™, Prezcobix®, Symtuza™, Stribild®, and Genvoya® see **Combination Products** for more detail

Ritonavir (Norvir®, RTV, /r)
(rih-TAH-nuh-veer) (G) [21] (H) (OC) (TB)

Dosage form: 100 mg tab, 100 mg oral powder packet, 80 mg/mL soln (240 mL/bottle)
Used only at low doses with other PIs
(see primary PI for dosing, food requirements and adverse effects)

Important Points:
- Store tabs at room temp; do not refrigerate soln

21. Food requirements depend on concomitant PI. See information in PI section of resource.

PROTEASE INHIBITORS (PIs)

Class adverse effects: ↑ *glucose, ↑ lipids (less with ATV and DRV), lipodystrophy, ↑ LFTs, nausea, vomiting, diarrhea (more common with LPV/r compared to DRV or ATV) ↑ bleeding in hemophiliacs. All undergo hepatic metabolism mostly via CYP3A4 - Many drug interactions. See DHHS Guidelines and www.hiv-druginteractions.org.*

Atazanavir (Reyataz®, ATV)
(ah-ta-ZA-na-veer) (G) (R) (H) (OC) (TB)

Dosage form: 100, 150, 200, ♦300 mg cap, 50 mg oral powder packets
Also available in combination product: Evotaz®; see **Combination Products** for more detail
Adult and adolescent dose (weight ≥ 40 kg):
- 400 mg PO once daily (ART-naïve only) or
- 300 mg + (COBI 150 mg or RTV 100 mg) PO once daily (naïve, exp, or with TDF)

Important Points:
- Take with food
- Interacts with acid reducing agents. See Table 7.
- AEs: ↑ unconjugated bilirubin (common), jaundice or scleral icterus (less common); rash; prolonged PR interval, asymptomatic 1st degree AV block (rare); nephrolithiasis (rare), cholelithiasis

Table 7. Atazanavir Dosing with Acid-reducing Agents

Acid-reducing Agents	ART-naïve	ART-exp
Antacids or buffered medications	ATV, ATV/c, ATV/r: Give ≥ 2 hours before or 1 to 2 hours after antacid or buffered medication	
H2 Receptor Antagonists (H2RAs) Approximate Dose Equivalents:[22] Famotidine 20 mg BID or 40 mg qhs Nizatidine 150 mg BID or 300 mg qhs Ranitidine 150 mg BID or 300 mg qhs	**ART-naïve with or without TDF** • ATV: Give ≥ 2 hours before or 10 hours after H2RA. Max dose of famotidine 20 mg bid (not to exceed 20 mg in single dose) [or equivalent]. • ATV/r or ATV/c: Give simultaneously with or ≥ 10 hours after H2RA. Max dose of famotidine 40 mg bid [or equivalent].	**ART-exp without TDF** ATV/r or ATV/c: Give simultaneously **with or ≥ 10 hours after** H2RA. Max dose of famotidine 20 mg bid [or equivalent]. **ART-exp with TDF** ATV/r (400/100 mg) or ATV/c (400/150 mg): Give simultaneously with or ≥ 10 hours after H2RA. Max dose of famotidine 20 mg bid [or equivalent].
Proton Pump Inhibitors (PPIs) Approximate Dose Equivalents:[23] Esomeprazole 20 mg Lansoprazole 30 mg Omeprazole 20 mg Pantoprazole 40 mg Rabeprazole 20 mg	• ATV: not recommended • ATV/r or ATV/c: Max dose of omeprazole 20 mg once daily [or equivalent] taken ≥ 12 hours prior to ATV/r	ATV/r or ATV/c: **not recommended**

22. Histamine H2 Blocker Oral Dose Comparison. Pharmacist's Letter. 2009;25: Detail –document #250801.
23. Proton Pump Inhibitor Dose Comparison. Pharmacist's Letter. 2009;25: Detail –document #250801.

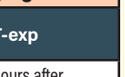
Darunavir (Prezista®, DRV)
(da-ROO-nuh-veer) (H) (OC) (TB)

Dosage form: 75, 150, ♦600, ♦800 mg tab, 100 mg/mL susp (200 mL/bottle)
Also available in combination products: Prezcobix® and Symtuza™; see **Combination Products** for more detail
Adult and adolescent dose (weight ≥ 40 kg):
- 800 mg + (COBI 150 mg or RTV 100 mg) PO once daily (ART-naïve or ART-exp if no DRV mutations [V11I, V32I, L33F, I47V, I50V, I54L, I54M, T74P, L76V, I84V, L89V])[24] **or**
- 600 mg + RTV 100 mg PO bid (ART-naïve or ART-exp)

Important Points:
- Take with food
- AEs: Rash (10%), abdominal pain, headache, hepatotoxicity, caution with sulfa allergy (not contraindicated)

24. Prezista® *[package insert]*. Titusville, NJ: Janssen Pharmaceuticals, Inc.; Revised January 2019.

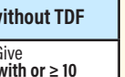
Fosamprenavir (Lexiva®, FPV)[25]
(foss-am-PREH-nah-veer) [26] (H) (OC) (TB)



Rarely used

25. See Lexiva® Prescribing Information for dosage forms, dosing, adverse effects and other important points
26. Suspension: adults without food; peds with food.

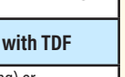
Indinavir (Crixivan®, IDV)[27]
(in-DIH-nuh-veer) [28] (H) (OC) (TB)



Rarely used

27. See Crixivan® Prescribing Information for dosage forms, dosing, adverse effects and other important points.
28. If given without RTV (rarely, if ever, done), take 1 hour before or 2 hours after a meal or with low fat/protein snack.

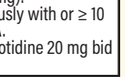
Nelfinavir (Viracept®, NFV)[29]
(nell-FIH-nuh-veer) (H) (OC) (TB)



Rarely used

29. See Viracept® Prescribing Information for dosage forms, dosing, adverse effects and other important points.

Saquinavir (Invirase®, SQV)[30]
(sa-KWIH-nuh-veer) (H) (OC) (TB)



Rarely used

30. See Invirase® Prescribing Information for dosage forms, dosing, adverse effects and other important points.

Tipranavir (Aptivus®, TPV)[31]
(ti-PRAN-a-veer) [32] (H) (OC) (TB)

Rarely used

31. See Aptivus® Prescribing Information for dosage forms, dosing, adverse effects and other important points.
32. Take with food with RTV tabs. Take without regard to meals with RTV soln.

ENTRY INHIBITORS

Fusion Inhibitor

Enfuvirtide (Fuzeon®, T20, ENF)[33]
(en-FEW-ver-tide)

Rarely used

33. See Fuzeon® Prescribing Information for dosage forms, dosing, adverse effects and other important points.

CCR5 Inhibitor

Maraviroc (Selzentry®, MVC)[34]
(mah-RAV-er-rock) (R) (H) (TB)

Rarely used

34. See Selzentry Prescribing Information for dosage forms, dosing, adverse effects and other important points

CD4-Directed Post-attachment HIV-1 Inhibitor

Ibalizumab-uiyk (Trogarzo™)[35]
(eye-ba-LIZ-ue-mab)

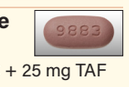
Rarely used

35. See Trogazo™ Prescribing Information for dosage forms, dosing, adverse effects and other important points.

INTEGRASE STRAND TRANSFER INHIBITORS (INSTIs)

Class adverse effects: Insomnia, depression and suicidal ideation reported infrequently, more common in pts with pre-existing psychiatric conditions, weight gain.
See DHHS Guidelines and www.hiv-druginteractions.org.

Bictegravir/emtricitabine/tenofovir alafenamide
(**Biktarvy®** | *bik-TAR-vee*) (R) (H) (TB)



Each tab contains: 50 mg bictegravir (BIC) + 200 mg FTC + 25 mg TAF
Adult dose: 1 tab PO once daily
- See Full Regimen Combinations for important points

Dolutegravir
(**Tivicay®**[36], **DTG** | *Doe-loo-teg'-ra-vir*) (R) (H) (TB)

Dosage form: 10, 25, 50 mg tab
Also available in combination products: Juluca® and Triumeq®; see **Combination Products** for more detail
Adult and adolescent dose[37] (weight ≥ 40 kg):
- 50 mg PO once daily (ART-naïve or exp but INSTI-naïve) **or**
- 50 mg PO bid (ART-naïve or exp but INSTI-naïve when given with potent UGT1A/CYP3A inducers [e.g., EFV, FPV/r, TPV/r, carbamazepine, or rifampin]) **or**
- 50 mg PO bid (pts with clinically suspected INSTI resistance or INSTI mutations)

See the Viking-3 trial data in the Tivicay® Prescribing Information for predicted efficacy response in the setting of certain INSTI resistance mutations.
Refer to: http://hivdb.stanford.edu/DR/INIResiNote.html for a complete list of INSTI mutations. In the setting of suspected or known INSTI resistance, consider a regimen that does not include metabolic inducers.

Important Points:
- Interacts with polyvalent cations. See Table 8.
- AEs: Headache and insomnia most common. Hypersensitivity reaction including rash, constitutional symptoms and organ dysfunction (e.g. liver injury) have been reported.
- Increase in SCr (without a decrease in glomerular function).

36. Tivicay® *[package insert]*. Research Triangle Park, NC: ViiV Healthcare; Revised October 2019.
37. Do not combine with NVP. Do not combine with ETR unless ATV/r, DRV/r, or LPV/r included in regimen as ETR may ↓ DTG levels. Note: DHHS Guidelines do not recommend combining ETR with ATV (± RTV).

Raltegravir (Isentress®, Isentress® HD, RAL)
(ral-TEG-ra-veer) (H) (TB)

Dosage form: ♦400 mg tab, ♦600 mg tab (HD), 25 mg, 100 mg chewable tabs, 100 mg packet for oral suspension
Adult and adolescent dose (weight ≥ 25 kg) for RAL: 400 mg PO bid
Adult and adolescent dose (weight ≥ 40 kg) for RAL HD: 1200 mg PO once daily

Important Points:
- Interacts with polyvalent cations. See Table 8.
- AEs: Diarrhea, nausea, headache; ↑ ALT, AST, CPK; myopathy and rhabdomyolysis have been reported, rare severe skin reactions (SJS/TEN) and systemic HSR with rash and constitutional symptoms +/- hepatitis

COMBINATION PRODUCTS

See individual drug components for important points

NRTI Combinations

Lamivudine/tenofovir disoproxil fumarate
(**Cimduo™, Temyxis™** | *sim-DEW-oh*) (R)

Each tab contains: 300 mg 3TC + 300 mg TDF
Adult and Adolescent dose (weight ≥ 35 kg): 1 tab PO once daily

Lamivudine/zidovudine
(**Combivir®** | *COM-bih-veer*) (G) (R)

Each tab contains: 150 mg 3TC + 300 mg ZDV
Adult and adolescent dose (weight ≥ 30 kg): 1 tab PO bid

Emtricitabine/tenofovir alafenamide
(**Descovy®** | *des-KOH-vee*) (R) (TB)

Each tab contains: 200 mg FTC + 25 mg TAF
Adult and adolescent dose (weight > 35 kg): 1 tab PO once daily

Abacavir/lamivudine
(**Epzicom®** | *EP-zih-com*) (G) (R) (H)

Each tab contains: 600 mg ABC + 300 mg 3TC
Adult and adolescent dose (weight ≥ 25 kg): 1 tab PO once daily
NOTE: Perform HLA-B*5701 test prior; only use if negative

NRTI Combinations (Continued)

Abacavir/lamivudine/zidovudine
(**Trizivir®** | *TRY-zih-veer*) (G) (R) (H)

Each tab contains: 300 mg ABC + 150 mg 3TC + 300 mg ZDV
Adult and adolescent dose (weight ≥ 40 kg): 1 tab PO bid
NOTE: Perform HLA-B*5701 test prior; only use if negative

Emtricitabine/tenofovir disoproxil fumarate
(**Truvada®** | *true-VAH-duh*) (R)

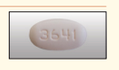
Each tab contains: 200 mg FTC + 300 mg TDF
Adult and adolescent dose (weight ≥ 35 kg): 1 tab (200 mg FTC/300 mg TDF) PO once daily
Also available in pediatric dosing formulations: 100 mg FTC + 150 mg TDF, 133 mg FTC + 200 mg TDF and 167 mg FTC + 250 mg TDF

Table 8. INSTI Interactions with Acid-reducing Agents and Polyvalent Cations

	Bictegravir (BIC)	Dolutegravir (DTG)	Elvitegravir/ cobicistat (EVG/c)	Raltegravir (RAL)
Antacids (e.g., Al, Mg, Ca)	• Take BIC ≥ 2 hours before or ≥ 6 hours after antacids containing Al or Mg • Take BIC with antacids containing Ca with food	Take DTG ≥ 2 hours before or ≥ 6 hours after antacids containing Al, Mg, Ca	Take EVG/c ≥ 2 hours before or ≥ 2 hours after antacids containing Al, Mg, Ca	**With calcium carbonate antacids:** • No dosage adjustment or separation needed with RAL 400 mg bid • Do not use once daily RAL HD formulation with calcium carbonate antacids **With Al and/or Mg containing antacids:** •Do not combine
Polyvalent cation (e.g., Al, Ca, Fe, Mg, Zn) containing medications including multivitamins, supplements, laxatives, sucralfate and buffered medications	**Supplements containing Ca or Fe:** • Take simultaneously with food or if fasting, take BIC ≥ 2 hours before **Other polyvalent cations (editor recommendation):** • Take BIC ≥ 2 hours before or ≥ 6 hours after	**Supplements containing Ca or Fe:** • Take simultaneously with food or if fasting, take DTG ≥ 2 hours before or ≥ 6 hours after **Other polyvalent cations:** • Take DTG ≥ 2 hours before or ≥ 6 hours after	Take EVG/c ≥ 2 hours before or ≥ 6 hours after polyvalent cation containing supplements	Take RAL ≥ 2 hours before or ≥ 6 hours after polyvalent cation containing supplements
H2-Receptor Antagonists	No dose adjustment necessary			
Proton Pump Inhibitors	No dose adjustment necessary			

PI Combinations

Atazanavir/cobicistat
(**Evotaz®** | *EV-oh-taz*) (R) (H) (OC) (TB)



Each tab contains: 300 mg ATV + 150 mg COBI
Adult dose: 1 tab PO once daily

Darunavir/cobicistat
(**Prezcobix®** | *prez-koe-bix*) (R) (H) (OC) (TB)

Each tab contains: 800 mg DRV + 150 mg COBI
Adult dose: 1 tab PO once daily

Lopinavir/ritonavir
(**Kaletra®**[38] | *kuh-LEE-tra*) [39] (H) (OC) (TB)

Rarely used

38. See Kaletra® Prescribing Information for dosage forms, dosing, adverse effects and other important points.
39. Tabs are with or without food; soln is with food.

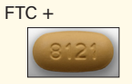
Full Regimen Combinations

Bictegravir/emtricitabine/tenofovir alafenamide
(**Biktarvy®** | *bik-TAR-vee*) (R) (H) (TB)

Each tab contains: 50 mg bictegravir (BIC) + 200 mg FTC + 25 mg TAF
Adult dose: 1 tab PO once daily

Important points:
- Interacts with polyvalent cations. See Table 8.
- AEs: BIC: diarrhea, nausea, headache

Darunavir/cobicistat/emtricitabine/tenofovir alafenamide
(**Symtuza™** | *sim toó zah*) (R) (H) (OC) (TB)



Each tab contains: 800 mg DRV + 150 mg COBI + 200 mg FTC + 10 mg TAF
Adult dose: 1 tab PO once daily
Important Points: Take with food

Dolutegravir/abacavir/lamivudine
(**Triumeq®** | *TRI-u-meck*) (R) (H) (TB)

Each tab contains: 50 mg DTG + 600 mg ABC + 300 mg 3TC
Adult and adolescent dose (weight ≥ 40 kg): 1 tab PO once daily
NOTE: Perform HLA-B*5701 test prior; only use if negative and pt not co-infected with hepatitis B virus

Dolutegravir/lamivudine
(**Dovato®**) (R) (H) (TB)

Each tab contains: 50 mg DTG and 300 mg 3TC
Adult dose: 1 tab PO once daily

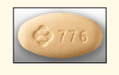
Important points:
- Interacts with polyvalent cations. See Table 8
- Only for adults with no antiretroviral treatment history, HIV RNA < 500,00 copies/mL, no HBV coinfection and with no resistance mutations to the individual components

Dolutegravir/rilpivirine
(**Juluca®** | *Jah-LOO-kah*) (R) (H) (TB)

Each tab contains: 50 mg DTG + 25 mg RPV
Adult dose: 1 tab PO once daily

Important Points:
- Take with a meal (at least 400 kcal)
- Not intended for ART-naive pts. Juluca® can be used in pts who are virologically suppressed (HIV-1 RNA <50 copies/mL) on a stable antiretroviral regimen for ≥6 months with no history of treatment failure and no known resistance mutations to the individual components of Juluca®.

Doravirine/lamivudine/tenofovir disoproxil fumarate
(**Delstrigo™** | *del-STREE-go*) (H) (R) (OC) (TB)



Each tab contains: 100 mg DOR + 300 mg 3TC + 300 mg TDF
Adult dose: 1 tab PO once daily

Efavirenz/emtricitabine/tenofovir disoproxil fumarate
(**Atripla®** | *uh-TRIP-luh*) (R) (H) (OC) (TB)

Each tab contains: 600 mg EFV + 200 mg FTC + 300 mg TDF
Adult and adolescent dose (weight ≥ 40 kg): 1 tab PO once daily at bedtime

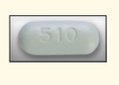
Important Points:
- Take at bedtime without food to ↓ CNS side effects

Efavirenz/lamivudine/tenofovir disoproxil fumarate
(**Symfi™ & Symfi Lo™** | *SIM-fee & SIM-fee LOW*) (R) (H) (OC) (TB)

Each tab contains: 600 mg EFV + 300 mg 3TC + 300 mg TDF (Symfi™)
400 mg EFV + 300 mg 3TC + 300 mg TDF (Symfi Lo™)
Adult and Adolescent dose (weight ≥ 35 kg): 1 tab PO once daily

Important Points:
- Take at bedtime without food to ↓ CNS side effects

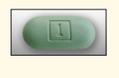
Elvitegravir/cobicistat/emtricitabine/tenofovir alafenamide
(**Genvoya®** | *jen-VOY-uh*) (R) (H) (OC) (TB)



Each tab contains: 150 mg EVG + 150 mg COBI + 200 mg FTC + 10 mg TAF
Adult and adolescent dose (age ≥ 12 years and weight ≥ 35 kg): 1 tab PO once daily

Important Points:
- Take with food
- Interacts with polyvalent cations. See Table 8.
- AEs: EVG/COBI: diarrhea, nausea

Elvitegravir/cobicistat/emtricitabine/tenofovir disoproxil fumarate
(**Stribild®** | *STRY-bild*) (R) (H) (OC) (TB)



Each tab contains: 150 mg EVG + 150 mg COBI + 200 mg FTC + 300 mg TDF
Adult and adolescent dose (weight > 35 kg and Tanner stage 4 or 5): 1 tab PO once daily

Important Points:
- Take with food
- Do not initiate in pts with CrCL < 70
- Interacts with polyvalent cations. See Table 8.
- AEs: EVG/COBI: diarrhea, nausea

Rilpivirine/emtricitabine/tenofovir alafenamide
(**Odefsey®** | *oh-DEF-see*) (R) (H) (TB)

Each tab contains: RPV 25 mg + 200 mg FTC + 25 mg TAF
Adult and adolescent dose (weight ≥ 35 kg): 1 tab PO once daily

Important Points:
- Take with a meal (at least 400 kcal)
- Interacts with acid reducing agents. See Table 6.

Rilpivirine/emtricitabine/tenofovir disoproxil fumarate
(**Complera®** | *com-PLAIR-uh*) (R) (H) (TB)

Each tab contains: 25 mg RPV + 200 mg FTC + 300 mg TDF
Adult and adolescent dose (weight ≥ 35 kg): 1 tab PO once daily

Important Points:
- Take with a meal (at least 400 kcal)
- Interacts with acid reducing agents. See Table 6.