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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 HIV-1-infected adults and adolescents. Department of Health and Human Services. July 14, 2016. Available at: https://aidsinfo.nih.gov/contentfiles/lvguidelines/adultandadolescentgl.pdf. Accessed December 15, 2016.

Pregnancy & Perinatal Guidelines

For pregnant woman, see the Perinatal Guidelines for managing HIV infection in pregnancy including recommendations for prevention of mother to child transmission.
https://aidsinfo.nih.gov/contentfiles/lvguidelines/PerinatalGL.pdf

Definition of Symbols

- G = Generic Available
- = Take with food; = Take without food; = Take with or without food
- R = Renal Adjustment (See table)
- H = Hepatic Adjustment See DHHS Guidelines (Appendix B, Table 7) for recommendations for dosing ART in pts with hepatic insufficiency.
- ↑OC = ↑ Combination Oral Contraceptive Level
- ↓OC = ↓ Combination Oral Contraceptive Level; Use alternate/additional form of birth control
- OC = Do not coadminister with Combination Oral Contraceptive
- 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.

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

Adapted from Table 6 of the Guidelines.

Regimens within classes are in 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. ART can be started prior to the results of resistance testing, for example in the setting of acute HIV infection. If ART is initiated without results of resistance testing, [Darunavir/r or dolutegravir] + tenofovir disoproxil fumarate/emtricitabine recommended (AIII[1]).

Recommended Regimen Options (All rated AI or AII[1])

INSTI-Based

- Dolutegravir/abacavir/lamivudine[2] (Triumeq®) - **Only if HLA-B*5701 negative**
- Dolutegravir (Tivicay®) + [tenofovir disoproxil fumarate/emtricitabine[2] (Truvada®) **or** tenofovir alafenamide/emtricitabine (Descovy®)]
- Elvitegravir/c/tenofovir alafenamide/emtricitabine (Genvoya®)
- Elvitegravir/c/tenofovir disoproxil fumarate/emtricitabine (Stribild®)
- Raltegravir (Isentress®) + [tenofovir disoproxil fumarate/emtricitabine[2] **or** tenofovir alafenamide/emtricitabine]

PI-Based

- Darunavir (Prezista®)/r[2] + [tenofovir disoproxil fumarate/emtricitabine[2] **or** tenofovir alafenamide/emtricitabine]

Alternative Regimen Options: *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. (All rated BI or BII[1])*

NNRTI-Based

- Efavirenz/tenofovir disoproxil fumarate/emtricitabine[2] (Atripla®)
- Efavirenz (Sustiva®) + tenofovir alafenamide/emtricitabine
- Rilpivirine/tenofovir disoproxil fumarate/emtricitabine[2] (Complera®) **or** Rilpivirine/tenofovir alafenamide/emtricitabine (Odefsey®) **Only if pre-ART viral load < 100,000 copies/mL and CD4 > 200 cells/mm³**

PI-Based

- [Atazanavir/r (Reyataz®/r) **or** atazanavir/c (Evotaz™)] + [tenofovir disoproxil fumarate/emtricitabine[2] **or** tenofovir alafenamide/emtricitabine]
- Darunavir/r **or** darunavir/c (Prezcobix®) + abacavir/lamivudine[2] (Epzicom®) - **Only if HLA-B*5701 negative**
- Darunavir/c + [tenofovir disoproxil fumarate/emtricitabine[2] **or** tenofovir alafenamide/emtricitabine]

Other Regimen Options: *When compared to Recommended or Alternative options, may have ↓ virologic efficacy, limited data from large comparative clinical trials, more toxicities, higher pill burden, drug interaction potential or limitations for use in certain pt populations. (All rated CI, CII, or CII[1])*

If HIV RNA < 100,000 copies/mL and HLA-B*5701 negative

- [Atazanavir/c **or** atazanavir/r] + abacavir/lamivudine[2]
- Efavirenz + abacavir/lamivudine[2]
- Raltegravir + abacavir/lamivudine[2]

Other Regimens when Tenofovir alafenamide, Tenofovir disoproxil fumarate, or Abacavir Cannot be Used

- Darunavir/r once daily + raltegravir twice daily - **Only if pre-ART viral load < 100,000 copies/mL and CD4 > 200 cells/mm³**
- Lopinavir/r (Kaletra®) twice daily + lamivudine[2] (Epivir®) twice daily

1. See Table 2 of DHHS Guidelines for rating scheme for strength of recommendations/quality of evidence.
2. Emtricitabine may replace lamivudine and vice versa (co-formulation is major determining factor).

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

Fact Sheet: Pharmaceutical Company Co-payment Assistance Programs (CAP)

This fact sheet from the National Alliance of State & Territorial AIDS Directors (NASTAD) provides background on what co-payment assistance programs are and an overview of CAP contact information, drugs covered, and assistance offered. (http://www.nastad.org/sites/default/files/121330_HIV_and_PAPs_CAPs_Resource_Document.pdf)

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Antiretroviral Regimens or Components Not Recommended at Any Time

Agent(s)	Comments
Monotherapy (AII)	Rapid development of resistance; inferior to ≥ 3 drugs
Dual-NNRTI (AI)	Adverse events and drug-drug interactions prevent benefit
Dual-NRTI (AI)	Rapid development of resistance; inferior to ≥ 3 drugs
Triple NRTI (AI) exceptions: ABC/ZDV/3TC (BI) and possibly TDF/ZDV/3TC (BII)	Consider exceptions when preferred/alternative not feasible; ↑ early virologic non-response with ABC/TDF/3TC or TDF/ddI/3TC
d4T + ZDV (AII)	Both thymidine analogs; antagonistic
d4T + ddI (AII)	Toxicities: pancreatitis, neuropathy, ↑ lactate Fatalities (lactic acidosis with hepatic steatosis with or without pancreatitis) in pregnancy
ddI + TDF (AII)	↑ ddI levels and toxicity, ↑ virologic failure/resistance, potential for immunologic nonresponse/CD4 ↓; Consider altering regimen even if clinically stable on ddI/TDF containing regimen
FTC + 3TC (AIII)	Similar resistance profile; no benefit
EFV in 1st trimester or if pregnancy potential (AIII)	Teratogenic (in nonhuman primates) use only if no other options and potential benefits > risks (BIII)
EFV + (ATV/c or DRV/c)	Do not combine
EVG + (EFV or NVP)	Do not combine
ETR + (all unboosted PIs, ATV/r, ATV/c, DRV/c, FPV/r, or TPV/r) (AII)	Do not combine
NVP + (ATV/r, ATV/c, or DRV/c)	Do not combine
NVP in ART-naïve ♀ with CD4 > 250 cells/mm³ or ♂ with CD4 > 400 cells/mm³ (BI)	↑ symptomatic hepatic events; use only if potential benefits > risks
ATV + IDV (AIII)	Potential for additive hyperbilirubinemia
RTV as sole PI[3]	Pill burden; GI intolerance
Unboosted DRV, SQV, TPV (AII)	Should only be used with low-dose RTV or COBI (DRV)

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

Statin Interactions with ART[4]

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/c, ATV/r, DRV/c, LPV/r	Titrate atorvastatin dose carefully and use the lowest dose necessary (editors of this resource usually would not exceed 20 mg per day)
	DRV/r	Titrate atorvastatin dose carefully and use lowest dose necessary (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	Use lowest possible starting dose of pravastatin with careful monitoring
	LPV/r	No dosage adjustments necessary
Rosuvastatin	ATV/r LPV/r	Titrate rosuvastatin dose carefully and use lowest dose necessary (not to exceed 10 mg daily)
	ATV/c DRV/c or DRV/r	Titrate rosuvastatin dose carefully and use lowest dose possible while monitoring for toxicities (editors of this resource usually would not exceed 10 mg per day)

Stribild® (EVG/c/TDF/FTC) & Genvoya® (EVG/c/TAF/FTC) Interactions

Statin	Interacting Agent	Prescribing Recommendation
Atorvastatin Pravastatin Rosuvastatin	cobicistat	Titrate atorvastatin, pravastatin, or rosuvastatin dose carefully and use the lowest dose necessary
Fluvastatin Pitavastatin	cobicistat	No data or dosage recommendation
Lovastatin Simvastatin	cobicistat	**CONTRAINDICATED**

4. See DHHS Guidelines (Table 19b) 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 Dose Adjustments[5]

Note: See equation below for estimating Creatinine Clearance (CrCL) using the Cockcroft-Gault Equation

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	
Zidovudine	CrCL < 15 or HD[6]: 100 mg tid or 300 mg every 24 hours
Emtricitabine	CrCL 30-49: 200 mg cap every 48 hours; CrCL 15-29: 200 mg cap every 72 hours; CrCL < 15 or HD[6]: 200 mg cap every 96 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[6]: 50 mg x 1 then 25 mg every 24 hours
Tenofovir disoproxil fumarate[7]	CrCL < 70: Do not use with cobicistat 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: not recommended; HD[6]: 300 mg every week (assumes 3 HD sessions per week of approximately 4 hours each)
NNRTIs	
Nevirapine[8]	HD: Give extra 200 mg dose following each HD
Rilpivirine[9]	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[10]	Use with caution in INSTI-exp pts with severe renal impairment 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

5. No renal dose adj for abacavir, PIs (except ATV, lopinavir/r), NNRTIs, dolutegravir, raltegravir, or T20.
6. Dose after hemodialysis (HD) on HD days.
7. CAUTION: consider tenofovir disoproxil fumarate (TDF) as possible cause for renal dysfunction.
8. Viramune® *[package insert]*. Ridgefield, CT: Boehringer Ingelheim Pharmaceuticals, Inc.; Revised January 2014.
9. Edurant® *[package insert]*. Titusville, NJ: Janssen Therapeutics, Division of Janssen Products; Revised August 2015.
10. Tivicay® [package insert]. Research Triangle Park, NC: ViiV Healthcare; Revised June 2016.

R Renal Dosing for Combo Products

Agent(s)	Dose Adjustment
EFV/FTC/TDF (Atripla®)[7]	These fixed-dose combo products should not be used in pts with CrCL < 50. See dosing for individual agents.
ZDV/3TC (Combivir®)	
RPV/FTC/TDF (Complera®)[7]	
ABC/3TC (Epzicom®)	
DTG/ABC/3TC (Triumeq®)	
ABC/ZDV/3TC (Trizivir®)	
FTC/TDF (Truvada®)[7]	CrCL 30-49: One tab every 48 hours; CrCL < 30: Combo product cannot be used; 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
FTC/TAF (Descovy®)[11]	CrCL < 30: do not use
EVG/c/FTC/TAF (Genvoya®)[11]	
RPV/FTC/TAF (Odefsey®)[11]	
EVG/c/FTC/TDF (Stribild®)[7]	CrCL < 70: do not initiate CrCL < 50: discontinue

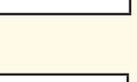
11. CAUTION: consider tenofovir alafenamide (TAF) as possible cause for renal dysfunction

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)[12]

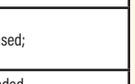
(dye-DAH-no-seen) G R

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

12. 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 B



Dosage form: 200 mg cap, 10 mg/mL soln (170 mL/bottle)
Also available in combination products: 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

ART Components Not Recommended as Part of Initial Therapy

Agent(s)	Comments	Agent(s)	Comments
ABC/ZDV/3TC ± TDF	↓ virologic efficacy	FPV (± RTV)	Unboosted FPV virologic failure may → DRV resistance mutations; less data with FPV/r than for other boosted PIs
d4T + 3TC	Lipoatrophy, peripheral neuropathy, symptomatic lactic acidosis, hepatic steatosis, and pancreatitis	IDV (± RTV)	Nephrolithiasis, meal/fluid requirements
ddI + (3TC or FTC)	↓ virologic efficacy; limited clinical trial data in ART-naïve; ddI toxicity	LPV/r + 2 NRTIs	Higher pill burden and RTV dose compared to other PIs; GI intolerance
ZDV/3TC	More toxicities (e.g., bone marrow suppression, GI toxicity, lipoatrophy, symptomatic lactic acidosis, hepatitis steatosis, and pancreatitis) than recommended NRTIs	NFV	↓ virologic efficacy; ↑ diarrhea
DLV	↓ virologic efficacy; inconvenient dosing	SQV/r	High pill burden; QT and PR prolongation possible and requires ECG monitoring
ETR	Insufficient data in ART-naïve	TPV/r	↓ virologic efficacy
NVP	Serious and potentially fatal toxicities (e.g., hepatic events, severe rash including SJS, TEN); did not meet noninferiority criteria compared to EFV	ENF, T20	Insufficient data in ART-naïve, T20 requires bid SQ injections
ATV (unboosted)	Less potent than boosted ATV	MVC	CCR5 tropism testing required prior to use; no virologic benefit compared to recommended regimens; requires bid dosing

Cockcroft-Gault Equation CrCL Estimation

Male

$$\frac{(140 - \text{age in years}) \times (\text{weight in kg})}{72 \times (\text{serum creatinine})}$$

Female

$$\frac{(140 - \text{age in years}) \times (\text{weight in kg}) \times 0.85}{72 \times (\text{serum creatinine})}$$

See Tables 17, 18, 19, and 20 of the DHHS guidelines and *www.hiv-druginteractions.org* for drug interaction information before prescribing any ART regimen.

NRTIs (Continued)

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®, Epzicom®, 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)[13]
(STA-vue-deen) G ⊘ ⊘ R

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

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

Tenofovir Disoproxil Fumarate (Viread®, TDF)
(ten-OH-foh-veer) ⊘ ⊘[14] 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: Truvada®, Atripla®, Complera®, Stribild®; see **Combination Products** for more detail
Adult and adolescent[15] 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)

14. Tabs are with or without food; powder is with food.
15. 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)

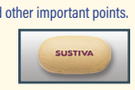
Class adverse effects: rash (rarely Stevens-Johnson Syndrome), ↑ LFTs, many drug interactions.
See DHHS Guidelines and www.hiv-druginteractions.org.

Delavirdine (Rescriptor®, DLV)[16]
(deh-LAH-ver-deen) ⊘ ⊘ H ↑OC TB

Rarely used

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

Efavirenz (Sustiva®, EFV)
(eh-FAH-vih-rehnz) ⊘ H OC[17] TB



- Dosage form: 50, 200 mg cap, ♦600 mg tab
Also available in combination product: Atripla®; 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

17. Consider alternative agent in ♀ with childbearing potential not using adequate birth control due to the risk of teratogenicity during the first 5-6 weeks of pregnancy. If pregnancy occurs while on EFV, EFV can be continued if the pt is virologically suppressed.

Etravirine (Intelence®, ETR)
(eh-truh-VIGH-reen) H ↑OC TB

Dosage form: 25, 100, ♦200 mg tab
Adult and adolescent dose[18] (weight ≥ 30 kg): 200 mg po bid

Important Points:
- Take following a meal
- May disperse tabs in 5mL of water, stir well. If desired mix with additional water, orange juice or milk (no warm or carbonated drinks) and then drink immediately. Rinse glass several times with water, milk, or orange juice and drink rinse.[19]
- AEs: Nausea, hypersensitivity reactions with rash, constitutional findings, hepatic failure has been reported

18. Do not use ETR with unboosted PIs, ATV/c, ATV/r, DRV/c, FPV/r, TPV/r. Standard dosing with DRV/r, LPV/r, SQV/r.
19. Intelence® *[package insert]*. Titusville, NJ: Janssen Therapeutics, Division of Janssen Products, LP; Revised August 2014.

Nevirapine (Viramune®,Viramune XR®, NVP)
(nah-VAIR-ah-peen) G ⊘ ⊘ H ↑OC TB

Dosage form: 100 mg tab (XR), ♦200 mg tab, ♦400 mg tab (XR), 10 mg/mL susp (240 mL bottle)
Adult and adolescent dose[20] (BSA ≥ 1.33 m^2):
200 mg po once daily for 14 days, then
[200 mg po bid or 400 mg (XR) po once daily]

Important Points:
- XR tabs should not be crushed, chewed, or broken
- AEs: Rash - mild to severe, usually within 1st 6 weeks, discontinue if severe; ↑ LFTs (Monitor LFTs - baseline, 2 weeks after dose escalation, then monthly for the 1st 18 weeks); hepatotoxicity often rash-associated, check LFTs in any pt with rash; ♀ and ♂ with pre-ART CD4 > 250 and > 400, respectively and pts with chronic active hep B or C co-infection are at ↑ risk for ↑ LFTs

20. If NVP discontinued ≥ 7 days, restart at lower dose for 14 days; pts taking NVP immediate release (200 mg bid or 400 mg once daily) can switch to XR 400 mg once daily without 200 mg daily lead-in dosing; if mild rash occurs and hepatotoxicity ruled out, can continue 200 mg once daily lead-in dose for up to 28 days.

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[21] (weight ≥ 35 kg): 25 mg once daily

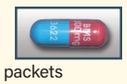
Important Points:
- Take with a meal (at least 400 kcal)
- Interacts with acid-reducing agents
  - PPIs (e.g., omeprazole, lansoprazole): contraindicated
  - H2-receptor blockers (e.g., famotidine, ranitidine) should be taken at least 12 hours before or 4 hours after RPV
  - Antacids (e.g., aluminum or magnesium hydroxide, calcium carbonate) should be taken at least 2 hours before or 4 hours after RPV
- Caution with drugs that prolong the QT interval
- AEs: Depression, insomnia, headache, rash

21. Not recommended in pts with pre-ART HIV RNA > 100,000 copies/mL or CD4 count < 200 cells/mm^3 due to ↑ rate of virologic failure

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) ⊘ R H OC[22] 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
- AEs: ↑ unconjugated bilirubin (common), jaundice or scleral icterus (less common); rash; prolonged PR interval, asymptomatic 1st degree AV block (rare); nephrolithiasis (rare), cholelithiasis

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)	**ART-naïve with or without TDF**	**ART-exp without TDF**
Approximate Dose Equivalents:[23] Famotidine 20 mg BID or 40 mg qhs Nizatidine 150 mg BID or 300 mg qhs Ranitidine 150 mg BID or 300 mg qhs	• 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].	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. ATV/r: OC dose **minimum** 35 mcg ethinyl estradiol (EE); ATV: OC dose **maximum** 30 mcg EE. Alternative contraception recommended. OCs with < 25 mcg EE, progestins other than norethindrone or norgestimate, and other hormonal contraceptives have not been studied. ATV/c: No data available regarding coadministration with oral or other hormonal contraceptive. Consider alternative nonhormonal contraception.
23. Tseng A. Interactions between acid reducing agents and antiretrovirals. Available at *http://www.hivclinic.ca/main/drugs_interact_files/acid-reducing%20agents-int.pdf*.

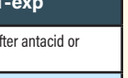
Darunavir (Prezista®, DRV)
(da-ROO-nuh-veer) H JOC TB

Dosage form: 75, 150, ♦600, ♦800 mg tab, 100 mg/mL susp (200 mL/bottle)
Also available in combination product: Prezcobix®; 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; Revised September 2016.

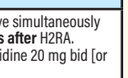
Fosamprenavir (Lexiva®, FPV)[25]
(foss-am-PREH-nah-veer) ⊘ ⊘[26] H OC TB



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 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.

Lopinavir/ritonavir (Kaletra®, KAL, LPV/r)
(lo-PIN-uh-veer/rih-TAH-nuh-veer) ⊘ ⊘[29] H JOC TB

Dosage form: ♦200/50 mg, 100/25 mg tab
400/100 mg per 5 mL soln (160 mL/bottle)
Adult and adolescent dose[30] (weight > 35 kg):
- 2 tabs (400/100 mg) po bid (PI-naïve or PI-exp) or
- 4 tabs (800/200 mg) po once daily (PI-naïve or PI-exp with ≤ 3 significant mutations)

Important Points:
- Swallow tabs whole; cannot be chewed, broken, or crushed
- May take tabs without food, soln should be taken with food
- Oral soln contains 42% alcohol
- AEs: GI intolerance (N/V/D); asthenia; pancreatitis; prolonged PR, rare cases of 2nd/3rd degree AV block; prolonged QT interval, rare cases of torsade de pointes (causality not established)
- Do not take tabs out of container for > 2 weeks especially in areas of ↑ humidity
- Refrigerate soln (stable until label date) or store at room temp (max 25°C/77°F) for up to 60 days

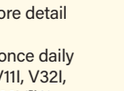
29. Tabs are with or without food; soln is with food.
30. Once daily dosing should not be used in pregnant ♀. Dose LPV/r bid in pts with ≥ 3 of the following PI mutations: L10F/I/R/V, K20M/N/R, L24I, L33F, M36I, I47V, G48V, I54L/T/V, V82A/C/F/S/T, and I84V.

Nelfinavir (Viracept®, NFV)[31]
(nell-FIH-nuh-veer) H JOC TB

Rarely used

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

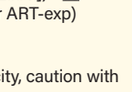
Saquinavir (Invirase®, SQV)[32]
(sa-KWIH-nuh-veer) H JOC TB



Rarely used

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

Tipranavir (Aptivus®, TPV)[33]
(ti-PRAN-a-veer) ⊘ ⊘[34] H JOC TB



Rarely used

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

ENTRY INHIBITORS

Fusion Inhibitor

Enfuvirtide (Fuzeon®, T20, ENF)[35]
(en-FEW-ver-tide)

Rarely used

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

CCR5 Inhibitor

Maraviroc (Selzentry®, MVC)
(mah-RAV-er-rock) ⊘ ⊘ R H TB

Dosage form: 25, 75, ♦150, 300 mg tab, 20 mg/mL oral soln (230 mL)
Note: Do not use in pts with dual/mixed tropic or CXCR4-tropic virus. Perform tropism assay prior to use and if virologic failure is suspected. A phenotypic tropism assay is preferred over a genotypic assay to predict co-receptor usage. Many drug interactions. See table below, DHHS Guidelines, and www.hiv-druginteractions.org.

Maraviroc Dosing

Concomitant Medications	Adult and adolescent Dose (weight ≥ 40 kg)
CYP3A inhibitors (with or without a CYP3A inducer)[36]: • protease inhibitors (except TPV/r) • cobicistat • ketoconazole, itraconazole, clarithromycin • other strong CYP3A inhibitors (e.g., nefazodone, telithromycin)	150 mg po bid
CYP3A inducers (without a strong CYP3A inhibitor) including[36]: • EFV, ETR • rifampin • carbamazepine, phenobarbital, and phenytoin	600 mg po bid
Other concomitant medications, including[36]: TPV/r, NVP, RPV, all NRTIs, T20, RAL, DTG	300 mg po bid

36. Concomitant medication lists are not all-inclusive

Important Points
- AEs: Hepatotoxicity: may be preceded by a systemic allergic reaction (↑ LFTs, pruritic rash, ↑ eos, other systemic symptoms), dizziness/postural hypotension, cough, pyrexia, URI, rash, musculoskeletal symptoms, abdominal pain, ↑ CV events (MI, ischemic events)

INTEGRASE STRAND TRANSFER INHIBITORS (INSTIs)

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

Dolutegravir (Tivicay®, DTG)
(Doe-loo-teg'-ra-vir) ⊘ ⊘ R H TB

Dosage form: 10, 25, 50 mg tab
Also available in combination product: 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® package insert for predicted efficacy response in the setting of certain INSTI resistance mutations.[38]
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:
- Take DTG ≥ 2 hours before or 6 hours after antacids, laxatives or other medications containing polyvalent cations (e.g., Al, Mg, Zn), including multivitamins with minerals, sucralfate, oral iron or calcium supplements, or buffered medications. Alternatively, DTG and multivitamins or supplements containing calcium or iron can be taken simultaneously with food.
- DTG ↑ metformin levels. When starting metformin or DTG, limit the total daily dose of metformin to 1,000 mg and adjust as indicated. Monitor blood glucose closely during concomitant use or after withdrawal of DTG.
- 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).

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).
38. Tivicay® *[package insert]*. Research Triangle Park, NC: ViiV Healthcare; Revised June 2016.

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

Dosage form: ♦400 mg tab, 25 mg, 100 mg chewable tabs, 100 mg packet for oral suspension
Adult and adolescent dose (weight ≥ 25 kg):
400 mg po bid

Important Points:
- Do not combine with antacids containing Al or Mg. No separation needed when given with $CaCO_3$ antacids. Take RAL ≥ 2 hours before or 6 hours after medications containing other polyvalent cations (e.g., Fe, Zn) including multivitamins with minerals.
- AEs: Diarrhea, nausea, headache, and pyrexia; ↑ ALT, AST, CPK; myopathy and rhabdomyolysis have been reported, rare severe skin reactions (SJS/TEN) and systemic HSR with rash and constitutional symptoms +/- hepatitis

PHARMACOKINETICS (PK) ENHANCERS

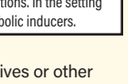
Cobicistat (Tybost®, COBI, /c)
(koe-BIK-i-stat) ⊘ R H OC[39] TB

Dosage form: 150 mg tab
Also available in combination products: Evotaz™, Prezcobix®, Stribild®, and Genvoya®
see **Combination Products** for more detail
(see primary PI for dosing, food requirements and adverse effects)

Important Points:
- Take with food
- Increase in SCr (without a decrease in glomerular function)

39. No data to make recommendation on use with oral or other hormonal contraceptives. Use alternate/additional form of birth control.

Ritonavir (Norvir®, RTV, /r)
(rih-TAH-nuh-veer) ⊘ ⊘[40] H TB



Dosage form: 100 mg tab,
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

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

COMBINATION PRODUCTS

NRTI Combinations
(see individual drug components for important points)

Combivir®
(COM-bih-veer) G ⊘ ⊘ R

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

Descovy®
(des-KOH-vee) ⊘ ⊘ R

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

Important Points:
- 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
- Abrupt withdrawal can cause chronic active hep B flares
- AEs: nausea, diarrhea, headache, renal insufficiency, osteopenia (renal and bone issues less common and increases in cholesterol, LDL, Trigs, HDL more common than with tenofovir disoproxil fumarate)

Epzicom®
(EP-zih-com) G ⊘ ⊘ R H

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

Trizivir®
(TRY-zih-veer) G ⊘ ⊘ R H

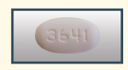
Each tab contains: 300 mg ZDV + 150 mg 3TC + 300 mg ABC
Adult and adolescent dose (weight ≥ 40 kg): 1 tab po bid
NOTE: Perform HLA-B*5701 test prior; only use if negative

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

PI Combinations
(see individual drug components for important points)

Evotaz™
(EV-oh-taz) ⊘ R H OC[41] TB



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

41. No data on use with oral or other hormonal contraceptives. Use alternate/additional form of birth control.

Prezcobix®
(prez-koe-bix) ⊘ ⊘ R H OC[41] TB

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

Kaletra® (KAL, LPV/r)
(kuh-LEE-tra) ⊘ ⊘[29] H JOC TB

Dosage Form: ♦200/50 mg, 100/25 mg tab
400/100 mg per 5 mL soln (160 mL/bottle)
Adult dose[30]: - 2 tabs (400/100 mg) po bid (PI-naïve or PI-exp) or
- 4 tabs (800/200 mg) po once daily (PI-naïve or PI-exp with ≤ 3 significant mutations)

Full Regimen Combinations

Atripla®
(uh-TRIP-luh) ⊘ R H OC[42] 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
- See individual drug components for other important points

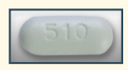
42. ♀ with child-bearing potential, should use 2 forms of birth control since EFV is teratogenic; consider pregnancy test prior to use.

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)
- See rilpivirine and tenofovir disoproxil fumarate/emtricitabine sections for other important points

Genvoya®
(jen-VOY-uh) ⊘ R H OC[43] 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
- Take ≥ 2 hours before or 2 hours after antacids containing Ca, Al, or Mg. Take EVG ≥ 2 hours before or 6 hours after other medications containing polyvalent cations (e.g., Al, Ca, Fe, Mg, Zn) including multivitamins with minerals and sucralfate.
- 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
- Abrupt withdrawal can cause chronic active hep B flares
- AEs: TAF: nausea, diarrhea, headache, renal insufficiency, osteopenia (renal and bone issues less common and increases in cholesterol, LDL, Trigs, HDL more common than with tenofovir disoproxil fumarate); FTC: ↑ pigmentation of palms/soles (> in black and Hispanic pts); EVG/COBI: diarrhea, nausea

43. ↑ norgestimate ↓ ethinyl estradiol. See package insert for potential risks/ benefits associated with this interaction. Interactions with alternative hormonal contraception not fully studied. Consider use of nonhormonal contraceptives.

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)
- See rilpivirine and tenofovir alafenamide/emtricitabine sections for other important points

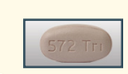
Stribild®
(STRY-bild) ⊘ R H OC[44] TB

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
- Can decrease bone mineral density, consider calcium and vitamin D supplementation (more likely with TDF versus TAF)
- See Genvoya® section for other important points

44. ↑ norgestimate ↓ ethinyl estradiol. See *[package insert]* for potential risks/benefits associated with this interaction. Interactions with alternative hormonal contraception not fully studied. Consider use of nonhormonal contraceptives.

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

Important Points:
- See individual drug components for other important points