

Table 4: Antiretroviral Medications by Level of Genetic Barrier to Resistance

Table 5: ART Options After First-Line Treatment Failure With Single-Class Drug Resistance

Box 1: Antiretroviral Medication Classes in Order of Position in Interruption of HIV Life Cycle

Table 4: Antiretroviral Medications by Level of Genetic Barrier to Resistance [a,b]		
Low Resistance (single mutation, common)	Intermediate Resistance (1 or 2 mutations, common)	High Resistance (>2 mutations, rarer)
- Lamivudine - Emtricitabine - Efavirenz - Nevirapine - Rilpivirine - Raltegravir - Elvitegravir - Ibalizumab - Lenacapavir	- Tenofovir disoproxil fumarate - Tenofovir alafenamide - Zidovudine - Abacavir - Doravirine - Cabotegravir - Fostemsavir	- Etravirine - Dolutegravir - Bictegravir - Darunavir [c] - Atazanavir [c] - Maraviroc
Notes: a. Derived from [Lataillade, et al. 2018; Oliveira, et al. 2018; Tang and Shafer 2012]. b. For group M, subtype B HIV. c. Combined with ritonavir or cobicistat.		

Table 5: ART Options After First-Line Treatment Failure With Single-Class Drug Resistance [a,b]	
Failed First-Line Regimen Drug Classes	Classes and Medication Options for Switch
2 NRTIs + 1 NNRTI [a]	2 NRTIs + 1 boosted PI: - TAF/FTC/DRV/COBI (single tablet) - TAF/FTC + DRV/RTV 2 NRTIs + 1 INSTI: - TAF/FTC/BIC (single tablet) - TAF/FTC + DTG
2 NRTIs + 1 PI [a]	2 NRTIs + 1 INSTI: - TAF/FTC/BIC (single tablet) - TAF/FTC + DTG 1 INSTI + 1 NNRTI: RPV/DTG (single tablet) 2 NRTIs + 1 fully active boosted PI
2 NRTIs + 1 INSTI [a]	2 NRTIs + 1 boosted PI: - TAF/FTC/DRV/COBI (single tablet) - TAF/FTC + DRV/RTV
Multiclass	2 NRTIs + 1 INSTI + 1 boosted PI +/- 1 NNRTI (based on genotype): - Consider: MVC [c], FTR, IBA, LEN, ETR, DOR, RPV, TPV
Abbreviations: ART, antiretroviral therapy; ARV, antiretroviral drug; BIC, bictegravir; COBI, cobicistat; DOR, doravirine; DRV, darunavir; DTG, dolutegravir; ETR, etravirine; FTC, emtricitabine; FTR, fostemsavir; IBA, ibalizumab; INSTI, integrase strand transfer inhibitor; LEN, lenacapavir; MVC, maraviroc; NNRTI, non-nucleoside reverse transcriptase inhibitor; NRTI, nucleoside/nucleotide reverse transcriptase inhibitor; PI, protease inhibitor; RAM, resistance-associated mutation; RPV, rilpivirine; RTV, ritonavir; TAF, tenofovir alafenamide; TPV, tipranavir.	
Notes: a. Single-class resistance, with no major NRTI RAMs other than M184V. b. Consider use of the ARV selection tool HIV-ASSIST . c. If current tropism assay indicates exclusive R5 tropic virus.	

Box 1: Antiretroviral Medication Classes in Order of Position in Interruption of HIV Life Cycle

- **Attachment inhibitors:** Fostemsavir (FTR; Rukobia), ibalizumab (IBA; Trogarzo)
- **Coreceptor antagonist:** Maraviroc (MVC; Selzentry)
- **Capsid inhibitor:** Lenacapavir (LEN; Sunlenca)
- **Nucleoside/nucleotide reverse transcriptase inhibitors:** Abacavir (ABC; Ziagen), emtricitabine (FTC; Emtriva), lamivudine (3TC; Epivir), tenofovir (TFV)
- **Non-nucleoside reverse transcriptase inhibitors:** Doravirine (DOR; Pifeltro), efavirenz (EFV; Sustiva), etravirine (ETR; Intelence), rilpivirine (RPV; Edurant)
- **Integrase strand transfer inhibitors:** Bictegravir (BIC; Biktarvy), dolutegravir (DTG; Tivicay), raltegravir (RAL; Isentress), elvitegravir/cobicistat (EVG/COBI; Genvoya or Stribild), cabotegravir (CAB; Cabenuva)
- **Protease inhibitors:** Atazanavir (ATV; Reyataz), darunavir (DRV; Prezista), ritonavir (RTV; Norvir; as a pharmacokinetic booster), tipranavir (TPV; Aptivus)

References

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