Dosing Guide: Recommended Dose Adjustments for Use of Selected Fixed-Dose Combination Antiretroviral Medications in Patients with Hepatic or Renal Impairment

Lead authors Nicole Bradley PharmD, BCPS, BCIDP; Yuman Lee, PharmD, BCIDP, AAHIVP, John M. Conry, PharmD, AAHIVP, FNAP; with the Medical Care Criteria Committee, May 2020

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<table>
<thead>
<tr>
<th>Fixed-Dose Combination</th>
<th>Hepatic Impairment Dose Adjustment [a]</th>
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<th>Individual Components of FDC and Recommended Dose Adjustment [a]</th>
<th>Clinical Comments</th>
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<tbody>
<tr>
<td><strong>Integrase Strand Transfer Inhibitors (INSTIs)</strong></td>
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</tbody>
</table>
| Abacavir/dolutegravir/lamivudine (ABC/DTG/3TC; Triumeq) | Child-Pugh A, B, C: Do not use. | CrCl <50 mL/min: Use of FDC is not recommended. | • ABC: No renal dose adjustment is needed.  
• DTG: No renal dose adjustment is needed.  
• 3TC:  
  - CrCl 30 to 49 mL/min: 150 mg once daily.  
  - CrCl 15 to 29 mL/min: 150 mg first dose then 100 mg once daily.  
  - CrCl 5 to 14 mL/min: 150 mg first dose then 50 mg once daily.  
  - CrCl <5 mL/min: 150 mg first dose then 25 mg once daily. | • CrCl >30 mL/min: Limited data to support use of FDC; 21 patients with CrCl >30 mL/min received full dose 3TC with minimal increases in AUC. No elevations in lactate or other ADRs reported [Fischetti, et al. 2018].  
• CrCl <30 mL/min, without HD: Renal adjustment should be based on individual components; 13 patients with CrCl <30 mL/min not on HD received 100 mg to 150 mg of 3TC with minimal increases in AUC. No elevations in lactate or other ADRs reported [Fischetti, et al. 2018].  
• CrCl <30 mL/min, with HD: Limited data to support use of FDC. Case series evaluating safety and efficacy of FDC in 9 patients with end-stage renal disease on HD reported viral suppression achieved in all 9 patients. No change in immune function. FDC generally well tolerated; one patient complained of nausea, which resolved without drug discontinuation [Michienzi, et al. 2019].  
• **Note:** DTG serum concentrations appear to be reduced in uninfected healthy controls with eGFR <30 mL/min/m² compared to those with normal kidney function. This may increase the risk of therapeutic failure among patients with HIV drug resistance to INSTIs. [Tivicay Package insert]. |
| Bictegravir/emtricitabine/tenofovir alafenamide [b] (BIC/FTC/TAF; Biktarvy) | Child-Pugh A, B: No dose adjustment is needed. | CrCl <30 mL/min: Use of FDC is not recommended. | • BIC: No renal adjustment is needed.  
• FTC:  
  - CrCl 30 to 49 mL/min: 200 mg every 48 hours.  
  - CrCl 15 to 29 mL/min: 200 mg every 72 hours. | • CrCl <30 mL/min: No data to support use of FDC. Renal dose adjustment should be based on individual components.  
• CrCl 15 to 29 mL/min: No BIC dose adjustment is...
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<tr>
<td>See package insert</td>
<td>Child-Pugh C: Do not use</td>
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<tr>
<td>Elvitegravir/cobicistat/emtricitabine/tenofovir disoproxil fumarate (EVG/COBI/FTC/TDF; Stribild)</td>
<td>Child-Pugh A, B: No dose adjustment is needed. Child-Pugh C: No data; do not use.</td>
<td>CrCl &lt;70 mL/min: Do not initiate therapy. Drop in CrCl to &lt;50 mL/min during treatment: Discontinue therapy.</td>
<td>EVG: No renal dose adjustment is needed. EVG/COBI: No renal dose adjustment is needed. FTC: CrCl 30 to 49 mL/min: 200 mg every 48 hours. CrCl 15 to 29 mL/min: 200 mg every 72 hours. CrCl &lt;15 mL/min: 200 mg every 96 hours. TDF: CrCl 30 to 49 mL/min: 300 mg every 48 hours. CrCl 10 to 29 mL/min: 300 mg every 72 to 96 hours. CrCl &lt;10 mL/min, without HD: No data available. CrCl &lt;10 mL/min, with HD: 300 mg every 7 days.</td>
<td>Child-Pugh A, B: No dose adjustment is needed. Child-Pugh C: Do not use. CrCl &lt;30 mL/min, without HD: No data to support use of FDC. Renal dose adjustment should be based on individual components. EVG/COBI: Dose adjustment not warranted. In 12 patients with eGFR &lt;30 mL/min (not on HD) and 12 controls with normal renal function given 7 days of EVG/COBI, lower EVG AUC, Cmax, and Cmin values and higher COBI AUC, Cmax, and Cmin values were observed in severe renal impairment, but values were not considered clinically relevant [German, et al. 2012].</td>
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<tr>
<td>Elvitegravir/cobicistat/emtricitabine/tenofovir alafenamide [b] (EVG/COBI/FTC/TAF; Genvoya)</td>
<td>Child-Pugh A, B: No dose adjustment is needed. Child-Pugh C: Do not use</td>
<td>CrCl &lt;70 mL/min: Use of FDC is not recommended.</td>
<td>EVG: No renal dose adjustment is needed. EVG/COBI: No renal dose adjustment is needed. FTC: CrCl 30 to 49 mL/min: 200 mg every 48 hours. CrCl 15 to 29 mL/min: 200 mg every 72 hours. CrCl &lt;15 mL/min: 200 mg every 96 hours. TAF: CrCl &lt;15 mL/min, without HD: Use is not recommended. CrCl &lt;15 mL/min, with HD: No renal dose adjustment is needed. ESRD, with HD: One tablet once daily; administer after HD on HD days.</td>
<td>Child-Pugh A, B: No dose adjustment is needed. Child-Pugh C: Do not use. CrCl &lt;30 mL/min, without HD: No data to support use of FDC. Renal adjustment should be based on individual components. CrCl &lt;15 mL/min, with HD: In a study of 55 patients on FDC for up to 96 weeks, 18 (33%) had grade 3 or higher ADR during treatment, and 3 patients discontinued treatment due to adverse effects. The authors concluded that, at 48 weeks, the FDC regimen was well tolerated in patients on HD [Eron, et al. 2018].</td>
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<tr>
<td>Dolutegravir/lamivudine (DTG/3TC; Dovato)</td>
<td>Child-Pugh A, B: No dose adjustment is needed. Child-Pugh C: Do not use</td>
<td>CrCl &lt;50 mL/min: Use of FDC is not recommended.</td>
<td>DTG: No renal dose adjustment is needed. 3TC: CrCl 30 to 49 mL/min: 150 mg once daily. CrCl 15 to 29 mL/min: 150 mg first dose, then 100 mg once daily.</td>
<td>Child-Pugh A, B: No dose adjustment is needed. Child-Pugh C: Do not use. CrCl &lt;50 mL/min: No data to support use of FDC. Renal dose adjustment should be based on individual components.</td>
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<td>CrCl 5 to 14 mL/min: 150 mg first dose, then 50 mg once daily.</td>
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<td>CrCl &lt;5 mL/min: 50 mg first dose, then 25 mg once daily.</td>
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<td>Dolutegravir/rilpivirine (DTG/RPV; Juluca)</td>
<td>not use.</td>
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<tr>
<td>Emtricitabine/rilpivirine/tenofovir alafenamide/FTC/RPV/TAF; Odefsey) [b]</td>
<td>see package insert</td>
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<td>Doravirine/lamivudine/tenofovir disoproxil fumarate (DOR/3TC/TDF; Delstrigo)</td>
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Non-Nucleoside Reverse Transcriptase Inhibitor (NNRTIs)

- **Emtricitabine/rilpivirine/tenofovir alafenamide/FTC/RPV/TAF; Odefsey) [b]**
  
  - **Child-Pugh A, B:** No dose adjustment is needed.
  - **Child-Pugh C:** No data; do not use.

- **CrCl <30 mL/min or ESRD:** No dose adjustment is needed; increased monitoring is recommended.

- **FTC:**
  - CrCl 30 to 49 mL/min: 200 mg every 48 hours.
  - CrCl 15 to 29 mL/min: 200 mg every 72 hours.
  - CrCl <15 mL/min: 200 mg every 96 hours.

- **RPV:** No renal dose adjustment needed.

- **TAF:**
  - CrCl <15 mL/min, without HD: Use is not recommended.
  - CrCl <15 mL/min, with HD: No renal dose adjustment is needed.

- **CrCl <30 mL/min, without HD:** No data to support use of FDC. Renal dose adjustment should be based on individual components.

- **CrCl <30 mL/min, with HD:** One FDC tablet once daily. On HD days, administer after dialysis [AIDSinfo 2019].

- Dose recommended based on data using FTC/TAF as part of FDC with EVG/COBI in patients on HD: In a study of 55 patients on EVG/COBI/FTC/TAF for up to 96 weeks, 18 (33%) had grade 3 or higher ADRs during treatment, and 3 patients discontinued treatment due to adverse effects. The authors concluded that at 48 weeks, the FDC regimen was well tolerated in patients on HD [Eron, et al. 2018].

- **CrCl <50 mL/min:** Use of FDC is not recommended.

- **3TC:**
  - CrCl 30 to 49 mL/min: 150 mg once daily.
  - CrCl 15 to 29 mL/min: 150 mg first dose, then 100 mg once daily.
  - CrCl 5 to 14 mL/min: 150 mg first dose, then 50 mg once daily.
  - CrCl <5 mL/min: 50 mg first dose, then 25 mg once daily.

- **DOR:** No renal dose adjustment is needed.

- **CrCl <50 mL/min:** No data to support use of FDC. Renal dose adjustment should be based on individual components.
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</table>
| Efavirenz/lamivudine/tenofovir disoproxil fumarate (EFV/3TC/TDF; Symfi Lo)  
See package insert |  | • TDF:  
  - CrCl 30 to 49 ml/min: 300 mg every 48 hours.  
  - CrCl 10 to 29 ml/min: 300 mg every 72 to 96 hours.  
  - CrCl <10 ml/min, without HD: No data available.  
  - CrCl <10 ml/min, with HD: 300 mg every 7 days. |  |
| Efavirenz/emtricitabine/tenofovir disoproxil fumarate (EFV/FTC/TDF; Atripla)  
See package insert |  | • TDF:  
  - CrCl 30 to 49 ml/min: 300 mg every 48 hours.  
  - CrCl 10 to 29 ml/min: 300 mg every 72 to 96 hours.  
  - CrCl <10 ml/min, without HD: No data available.  
  - CrCl <10 ml/min, with HD: 300 mg every 7 days. |  |
| Protease Inhibitors (Pis) |  |  |  |
| Darunavir/cobicistat/emtricitabine/tenofovir alafenamide (DRV/CObi/FTC/TAF; Symtuza) [b] |  |  |  |

### Notes:
- [a] Dose adjustment is based on creatinine clearance (CrCl) values.
- [b]推薦 dose adjustment for CrCl <70 ml/min is recommended when combined with TDF.
- [c] Renal dose adjustment should be based on individual components.
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<tr>
<td>See package insert</td>
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<td>- CrCl 15 to 29 mL/min: 200 mg every 72 hours.</td>
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<td>- CrCl &lt;15 mL/min: 200 mg every 96 hours.</td>
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<td><strong>TAF:</strong></td>
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<td>- CrCl &lt;15 mL/min, without HD: Use is not recommended.</td>
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<td>- CrCl &lt;15 mL/min, with HD: No renal dose adjustment is needed.</td>
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<tr>
<td>Nucleoside/Nucleotide Reverse Transcriptase Inhibitors (NRTIs)</td>
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**Emtricitabine/tenofovir alafenamide (FTC/TAF; Descovy)**

See package insert

- Child-Pugh A, B: No dose adjustment is needed.
- Child-Pugh C: No data.

- **CrCl <30 mL/min:** Use of FDC is not recommended.

- **FTC:**
  - CrCl 30 to 49 mL/min: 200 mg every 48 hours.
  - CrCl 15 to 29 mL/min: 200 mg every 72 hours.
  - CrCl <15 mL/min: 200 mg every 96 hours.

- **TAF:**
  - CrCl <15 mL/min, without HD: Use is not recommended.
  - CrCl <15 mL/min, with HD: No renal dose adjustment is needed.

- **CrCl <30 mL/min, without HD:** No data to support use of FDC. Renal adjustment should be based on individual components.
- **CrCl <30 mL/min, with HD:** One FDC once daily. On HD days, administer after HD [AIDSinfo 2019].

**Emtricitabine/tenofovir disoproxil fumarate (FTC/TDF; Truvada)**

See package insert

- No dose adjustment is needed.
- **CrCl <30 mL/min:** Use of FDC is not recommended.

- **FTC:**
  - CrCl 30 to 49 mL/min: 200 mg every 48 hours.
  - CrCl 15 to 29 mL/min: 200 mg every 72 hours.
  - CrCl <15 mL/min: 200 mg every 96 hours.

- **TDF:**
  - CrCl 30 to 49 mL/min: 300 mg every 48 hours.
  - CrCl 10 to 29 mL/min: 300 mg every 72 to 96 hours.
  - CrCl <10 mL/min, without HD: No data available.
  - CrCl <10 mL/min, with HD: 300 mg every 7 days

- **CrCl <30 mL/min:** No data to support use of FDC. Renal dose adjustment should be based on individual components.

**Abacavir/lamivudine (ABC/3TC; Epzicom)**

See package insert

- Child-Pugh A, B, C: Do not use.

- **CrCl <50 mL/min:** Use of FDC is not recommended.

- **ABC:** No renal dose adjustment is needed.
- **3TC:**
  - CrCl 30 to 49 mL/min: 150 mg once daily.

- **CrCl >30 mL/min:** Limited data to support use of FDC. No elevations in lactate or other ADRs reported in a study of 21 patients with CrCl >30 mL/min who...
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<td></td>
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<td>− CrCl 15 to 29 mL/min: 150 mg first dose, then 100 mg once daily.</td>
<td>received full dose of 3TC; minimal increases in AUC. [Fischetti, et al. 2018].</td>
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<td>− CrCl 5 to 14 mL/min: 150 mg first dose, then 50 mg once daily.</td>
<td>• CrCl &lt;30 mL/min, without HD: Renal dose adjustment should be based on individual components. 13 patients with CrCl &lt;30 mL/min received 100-150 mg of 3TC with minimal increases in AUC. No elevations in lactate or other ADRs reported [Fischetti, et al. 2018].</td>
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<td>− CrCl &lt;5 mL/min: 50 mg first dose, then 25 mg once daily.</td>
<td>• CrCl &lt;30 mL/min, with HD: Limited data to support use of FDC. A case series evaluating safety and efficacy of Triumeq (ABC/3TC/DTG) as an FDC in 9 patients with ESRD on HD showed viral suppression was achieved in all 9 patients. No change in immune function. FDC was generally well tolerated; one patient complained of nausea, which resolved without drug discontinuation [Michienzi, et al. 2019].</td>
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</table>

Abbreviations: ADR, adverse drug reaction; AUC, area under the curve; $C_{\text{max}}$, maximum plasma concentration; $C_{\text{min}}$, minimum plasma concentration; CrCl, creatinine clearance; eGFR, estimated glomerular filtration rate; ESRD, end-stage renal disease; HD, hemodialysis.

Notes:
a. Per package inserts; see links.
b. Per package inserts, FTC can be used at standard dose in FDCs that contain FTC/TAF when CrCl is >30 mL/min. FTC as an individual component requires renal dose adjustment when CrCl is <50 mL/min.

Other ARVs, not included above:
- TDF/FTC/RPV (Complera): See package insert
  - Renal dose adjustment: CrCl <50 mL/min: do not use.
  - Hepatic dose adjustment: Child-Pugh A,B—no adjustment; Child-Pugh C—no data
- Atazanavir (ATV; Reyataz): See package insert
  - Renal dose adjustment: No adjustment, but use only 300 mg dose with 100 mg RTV; do not use in treatment-experienced patients on HD.
  - Hepatic dose adjustment: Child-Pugh A,B—no adjustment; Child-Pugh C—no data
- ATV/COBI (Evotaz): See package insert
  - Renal dose adjustment: Do not use in patients with CrCl <70 mL/min taking a TDF-containing regimen; do not use in treatment-experienced patients on HD. Hepatic dose adjustment: No
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<tr>
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<td>data; not recommended.</td>
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<tr>
<td>• Raltegravir (RAL; Isentress): See package insert</td>
<td>Renal dose adjustment: None</td>
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<td></td>
<td>Hepatic dose adjustment: 400 mg twice daily—Child-Pugh A, B—no adjustment; Child-Pugh C—no data. 600 mg once daily: No data; use with caution.</td>
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</tbody>
</table>

REFERENCES


DRUG MANUFACTURER PACKAGE INSERTS


• **Evotaz**: FDA. Evotaz (atazanavir and cobicistat) tablets, for oral use. 2015 Jan. [https://www.accessdata.fda.gov/drugsatfda_docs/label/2015/206353s000lbl.pdf](https://www.accessdata.fda.gov/drugsatfda_docs/label/2015/206353s000lbl.pdf) [accessed 2020 May 14].

• **Genvoya**: FDA. Genvoya (elvitegravir, cobicistat, emtricitabine, and tenofovir alafenamide) tablets, for oral use. 2015 Nov. [https://www.accessdata.fda.gov/drugsatfda_docs/label/2015/207561s000lbl.pdf](https://www.accessdata.fda.gov/drugsatfda_docs/label/2015/207561s000lbl.pdf) [accessed 2020 Mar 5].

• **Isentress**: FDA. Isentress (raltegravir) tablets for oral use. 2013 June. [https://www.accessdata.fda.gov/drugsatfda_docs/label/2013/022145s029lbl.pdf](https://www.accessdata.fda.gov/drugsatfda_docs/label/2013/022145s029lbl.pdf) [accessed 2020 May 14].

• **Juluca**: FDA. Juluca (dolutegravir and rilpivirine) tablets, for oral use. 2017 Nov. [https://www.accessdata.fda.gov/drugsatfda_docs/label/2017/210192s000lbl.pdf](https://www.accessdata.fda.gov/drugsatfda_docs/label/2017/210192s000lbl.pdf) [accessed 2020 Mar 5].

• **Odefsey**: FDA. Odefsey (emtricitabine, rilpivirine, and tenofovir alafenamide) tablets, for oral use. 2016 Mar. [https://www.accessdata.fda.gov/drugsatfda_docs/label/2016/208351s000lbl.pdf](https://www.accessdata.fda.gov/drugsatfda_docs/label/2016/208351s000lbl.pdf) [accessed 2020 Mar 5].

• **Reyataz**: FDA. Reyataz (atazanavir) capsules, for oral use. 2016 Sept. [https://www.accessdata.fda.gov/drugsatfda_docs/label/2016/021567s039,206352s004lbl.pdf](https://www.accessdata.fda.gov/drugsatfda_docs/label/2016/021567s039,206352s004lbl.pdf) [accessed 2020 May 14].

• **Stribild**: FDA. Stribild (elvitegravir, cobicistat, emtricitabine, tenofovir disoproxil fumarate) tablets, for oral use. 2016 Sep. [https://www.accessdata.fda.gov/drugsatfda_docs/label/2016/203100s024lbl.pdf](https://www.accessdata.fda.gov/drugsatfda_docs/label/2016/203100s024lbl.pdf) [accessed 2020 Mar 5].

• **Symfi Lo**: FDA. Symfi Lo (efavirenz, lamivudine, and tenofovir disoproxil fumarate) tablets, for oral use. 2018 Feb. [https://www.accessdata.fda.gov/drugsatfda_docs/label/2018/208255s000lbl.pdf](https://www.accessdata.fda.gov/drugsatfda_docs/label/2018/208255s000lbl.pdf) [accessed 2020 Mar 5].

• **Symtuza**: FDA. Symtuza (darunavir, cobicistat, emtricitabine, and tenofovir alafenamide) tablets, for oral use. 2018 Jul. [https://www.accessdata.fda.gov/drugsatfda_docs/label/2018/210455s000lbl.pdf](https://www.accessdata.fda.gov/drugsatfda_docs/label/2018/210455s000lbl.pdf) [accessed 2020 May 14].

• **Triumeq**: FDA. Triumeq (abacavir, dolutegravir, and lamivudine) tablets, for oral use. 2017 Nov. [https://www.accessdata.fda.gov/drugsatfda_docs/label/2017/205551s011lbl.pdf](https://www.accessdata.fda.gov/drugsatfda_docs/label/2017/205551s011lbl.pdf) [accessed 2020 Mar 5].

• **Truvada**: FDA. Truvada (emtricitabine/tenofovir disoproxil fumarate) tablets, for oral use. 2004. [https://www.accessdata.fda.gov/drugsatfda_docs/label/2016/021752s047lbl.pdf](https://www.accessdata.fda.gov/drugsatfda_docs/label/2016/021752s047lbl.pdf) [accessed 2020 Mar 5].

• **Tivicay**: FDA. Tivicay (dolutegravir) tablets, for oral use. 2013. [https://www.accessdata.fda.gov/drugsatfda_docs/label/2013/204790lbl.pdf](https://www.accessdata.fda.gov/drugsatfda_docs/label/2013/204790lbl.pdf) [accessed 2020 Apr 13].