Antiretroviral Treatment Options for Patients on Directly Acting Antivirals for Hepatitis C

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<th>DAAs/NNRTIs</th>
<th>Daclatasvir</th>
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<td>Pak®/Pak® (US)</td>
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<td>60 mg daily with sofosbuvir 400 mg daily</td>
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| PIs: atazanavir | ↓ daclatasvir dose to 30 mg daily with atazanavir/ritonavir or atazanavir/cobicistat.³ | Contraindicated with atazanavir³: 10.58-fold ↑ grazoprevir AUC⁴ and 4.76-fold ↑ elbasvir exposures⁵ | Potential for ↑ tenofovir concentrations when administered with concomitant booster. Monitor for toxicity.⁶ | OK with atazanavir/ritonavir⁷ | Coadministration not recommended due to ↑ voxilaprevir concentrations.¹⁰ | OK with atazanavir 300 mg QD.¹¹,¹² | Contraindicated due to ↑ risk of ALT elevations.¹³ |          |
| PIs: other | No dose modifications required with darunavir/ritonavir, darunavir/cobicistat or lopinavir/ritonavir.² | Contraindicated with darunavir, lopinavir, saquinavir, tipranavir²: 7.5-12.86-fold ↑ grazoprevir AUC⁴ and 0.66-3.7-fold ↑ elbasvir exposures⁵ | Darunavir/ritonavir: ↑ voxilaprevir AUC¹⁴, but considered safe.¹⁵ | Darunavir/ritonavir: take without additional ritonavir; monitor HIV viral load due to decreased darunavir C trough (Canadian monograph). | Darunavir/ritonavir: Coadministration not recommended due to ↑ glecaprevir and pibrentasvir.¹³ |          |          |          |

| NNRTIs | Doravirine OK.¹⁶ | Doravirine OK.¹⁶ | Doravirine OK.¹⁶ | Doravirine OK.¹⁶ | Doravirine OK.¹⁶ | Doravirine OK.¹⁶ | Doravirine OK.¹⁶ | Doravirine OK.¹⁶ |

PIs: atazanavir↓ atazanavir dose to 30 mg daily with atazanavir/ritonavir or atazanavir/cobicistat.¹,²

Contraindicated with atazanavir³: 10.58-fold ↑ grazoprevir AUC⁴ and 4.76-fold ↑ elbasvir exposures⁵

Potential for ↑ tenofovir concentrations when administered with concomitant booster. Monitor for toxicity.⁶

OK with atazanavir/ritonavir⁷

Coadministration not recommended due to ↑ voxilaprevir concentrations.¹⁰

OK with atazanavir 300 mg QD.¹¹,¹²

Contraindicated due to ↑ risk of ALT elevations.¹³

PIs: other:

No dose modifications required with darunavir/ritonavir, darunavir/cobicistat or lopinavir/ritonavir.²

Contraindicated with darunavir, lopinavir, saquinavir, tipranavir²: 7.5-12.86-fold ↑ grazoprevir AUC⁴ and 0.66-3.7-fold ↑ elbasvir exposures⁵

Darunavir/ritonavir: ↑ voxilaprevir AUC¹⁴, but considered safe.¹⁵

Darunavir/ritonavir: take without additional ritonavir; monitor HIV viral load due to decreased darunavir C trough (Canadian monograph).

Darunavir/ritonavir: Coadministration not recommended due to ↑ glecaprevir and pibrentasvir.¹³

NNRTIs:

Doravirine OK.¹⁶

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Notes:

¹,²: 10.58-fold ↑ grazoprevir AUC and 4.76-fold ↑ elbasvir exposures.

³: 7.5-12.86-fold ↑ grazoprevir AUC and 0.66-3.7-fold ↑ elbasvir exposures.

⁴: 7.5-12.86-fold ↑ grazoprevir AUC and 0.66-3.7-fold ↑ elbasvir exposures.

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⁹: 7.5-12.86-fold ↑ grazoprevir AUC and 0.66-3.7-fold ↑ elbasvir exposures.

¹⁰: 7.5-12.86-fold ↑ grazoprevir AUC and 0.66-3.7-fold ↑ elbasvir exposures.

¹¹: 7.5-12.86-fold ↑ grazoprevir AUC and 0.66-3.7-fold ↑ elbasvir exposures.

¹²: 7.5-12.86-fold ↑ grazoprevir AUC and 0.66-3.7-fold ↑ elbasvir exposures.

¹³: 7.5-12.86-fold ↑ grazoprevir AUC and 0.66-3.7-fold ↑ elbasvir exposures.

¹⁴: 7.5-12.86-fold ↑ grazoprevir AUC and 0.66-3.7-fold ↑ elbasvir exposures.

¹⁵: 7.5-12.86-fold ↑ grazoprevir AUC and 0.66-3.7-fold ↑ elbasvir exposures.

¹⁶: 7.5-12.86-fold ↑ grazoprevir AUC and 0.66-3.7-fold ↑ elbasvir exposures.
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<th>Drug</th>
<th>Initial Dose and Dosing Schedule</th>
<th>Notes and Interactions</th>
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| Daclatasvir (Daklinza®, DCV)              | 60 mg daily with sofosbuvir 400 mg daily | ↑ daclatasvir dose to 90 mg once daily with efavirenz.1 \n|                                           |                                  | Contraindicated with efavirenz²: (84% ↓ grazoprevir AUC¹⁷ and 54% ↓ elbasvir AUC.¹⁸) \n|                                           |                                  | Efaviren OK.¹⁹ \n|                                           |                                  | Do not use with efavirenz (50% ↓ velpatasvir AUC).²⁰ \n|                                           |                                  | Coadministration with efavirenz not recommended due to decreased velpatasvir and voxilaprevir.¹⁰ \n|                                           |                                  | Contraindicated with efavirenz (increased risk of adverse events including LFT elevations).¹²,²¹ \n|                                           |                                  | Coadministration with efavirenz not recommended due to possible decreased glecaprevir and pibrentasvir.¹³ \n| Elbasvir/Grazoprevir (Zepatier®)           | 100 mg/50 mg coformulation once daily | No data. Coadministration not recommended with etravirine or nevirapine due to potential for ↓ daclatasvir.²² \n| Ledipasvir/Sofosbuvir (Harvoni®)          | 90/400 mg coformulation once daily | Not recommended with etravirine due to potential for decreased elbasvir and grazoprevir concentrations. \n| Sofosbuvir/Velpatasvir (Epclusa®)         | 400/100 mg coformulation once daily | Avoid or use with caution until further data available. \n| Sofosbuvir/Velpatasvir/Voxilaprevir (Vosevi®) | 400/100/100 mg coformulation once daily | Avoid or use with caution until further data available. \n| Holkira Pak®/Viekira Pak® (US)            |                                  | Etravirine contraindicated due to risk of decreased 3D exposures.¹² \n|                                           |                                  | Avoid or use with caution until further data available. \n| Glecaprevir/Pibrentasvir (Maviret®/Mavyret® - US) |                                  | \n|                                           |                                  | *dosed as glecaprevir 300 mg/pibrentasvir 120 mg = 3 tablets once daily \n
**InSTIs**

| Bictegravir OK.                            |                                  | Bictegravir OK.²⁷                            |
| Dolutegravir OK.                            |                                  | Dolutegravir OK.²⁹ \n|                                          | Monitor for tenofovir-associated toxicities if using tenofovir-based backbone.³⁰ |
| Raltegravir OK.                            |                                  | Raltegravir OK.¹⁹                            |

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<tr>
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<tr>
<td>↓ daclatasvir dose to 30 mg daily with cobicistat&lt;sup&gt;22&lt;/sup&gt;</td>
<td>Not recommended with elvitegravir/co/FTC/TDF due to increased elbasvir (2.2-fold increase) and grazoprevir (5.4-fold increase) concentrations.&lt;sup&gt;34&lt;/sup&gt;</td>
<td>Potential for ↑ tenofovir concentrations when administered with concomitant booster. Monitor for toxicity.&lt;sup&gt;7, 8&lt;/sup&gt;</td>
<td>Elvitegravir/co/FTC/TDF: 40% ↑ tenofovir AUC. Monitor for toxicity.&lt;sup&gt;9&lt;/sup&gt;</td>
<td>Elvitegravir/co/FTC/TDF: 40% ↑ tenofovir AUC. Monitor for toxicity.&lt;sup&gt;10&lt;/sup&gt;</td>
<td>Do not coadminister elvitegravir/cobicistat since paritaprevir and ombitasvir are coformulated with ritonavir.</td>
<td>Elvitegravir/ cobicistat OK.&lt;sup&gt;32&lt;/sup&gt;</td>
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<td>Avoid with elvitegravir/co/FTC/TAF (as above).</td>
<td>Elvitegravir/co/FTC/TAF: OK.&lt;sup&gt;30&lt;/sup&gt;</td>
<td>Elvitegravir/co/FTC/TAF: OK.&lt;sup&gt;3&lt;/sup&gt;</td>
<td>Elvitegravir/co/FTC/TAF: ↑ voxilaprevir AUC&lt;sup&gt;14&lt;/sup&gt; but considered safe.&lt;sup&gt;10&lt;/sup&gt;</td>
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<td>Maraviroc</td>
<td>Standard doses of both OK.&lt;sup&gt;23&lt;/sup&gt;</td>
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<td>Tenofovir DF OK.&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Tenofovir DF OK.&lt;sup&gt;18, 33&lt;/sup&gt;</td>
<td>Potential for ↑ tenofovir concentrations. Monitor for toxicity.&lt;sup&gt;8&lt;/sup&gt;</td>
<td>Potential for 40-81% ↑ tenofovir concentrations. Monitor for toxicity.&lt;sup&gt;35&lt;/sup&gt;</td>
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<td></td>
<td>Tenofovir alafenamide OK.&lt;sup&gt;25&lt;/sup&gt;</td>
<td>Tenofovir alafenamide OK.&lt;sup&gt;35&lt;/sup&gt;</td>
<td>Tenofovir alafenamide OK.&lt;sup&gt;10&lt;/sup&gt;</td>
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Key:  
- **Red** = avoid combination  
- **Yellow** = caution/dose adjustment  
- **Green** = combination OK

Co=cobicistat; FTC: emtricitabine; TAF = tenofovir alafenamide; TDF = tenofovir disoproxil fumarate

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