Treatment of HCV in Persons with HIV Coinfection

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Module 6: Treatment of Key Populations and Unique Situations
Lesson 1: Treatment of HCV in Persons with HIV Coinfection

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Background of HIV-HCV Coinfection

In the United States, approximately 5% of adults with chronic hepatitis C virus (HCV) infection have coinfection with HIV.[1] Among persons living with HIV in the United States, an estimated 6 to 30% have HCV coinfection, but these rates vary based on the composition of risk factors for acquiring HIV in any given cohort, with higher HCV prevalence among cohorts of persons with HIV who inject drugs.[2,3,4,5] Estimates of chronic HCV infection are also changing in the era of direct-acting antiviral (DAA) therapy, which are substantially more effective in curing HCV than older HCV treatments. Coinfection with HIV can accelerate the progression of hepatic fibrosis and contribute to a more aggressive course of liver disease among persons with untreated HCV (Figure 1).[6,7,8] Cirrhosis has been observed to occur 12 to 16 years earlier in persons with HCV and HIV coinfection compared with those who have HCV monoinfection.[9] For persons living with HIV who have HCV coinfection, liver-related morbidity and mortality is a prominent non-AIDS-related complication—up to 80 to 90% of liver-related deaths in persons living with HIV have been attributed to HCV infection.[10,11] Further, individuals with HIV and HCV coinfection have decreased access to liver transplantation compared with persons who have HCV monoinfection.[12] For these reasons, treatment of HCV in persons with HIV coinfection remains a high priority.

HCV Treatment Data in Persons with HIV Coinfection

Multiple HCV treatment studies using DAA therapy have demonstrated sustained virologic response (SVR) rates in individuals with HIV and HCV coinfection that are comparable to those with HCV monoinfection (Figure 2), providing convincing evidence that persons with HIV and HCV coinfection should no longer be considered a “treatment-refractory” population as they were known to be in the interferon era.[13] In these trials, most participants did not have cirrhosis, and most had CD4 counts well above 200 cells/mm^3.[14,15,16,17,18] Subsequently, however, a variety of observational cohort studies with heterogeneous cohorts of persons with HIV and HCV coinfection, including those with more advanced liver disease and lower CD4 cell counts, have shown comparable HCV SVR rates in persons with HIV and HCV coinfection compared with those who have HCV monoinfection.[19,20,21] For persons with HCV and HIV coinfection, treatment of HCV with first-line DAA regimens (glecaprevir-pibrentasvir or sofosbuvir-velpatasvir) generates SVR12 responses of at least 95%.[13,18,22] The following provides a summary of key clinical trials involving DAA treatment of HCV in persons with HIV coinfection.

- **Elbasvir-Grazoprevir** (C-EDGE Coinfection): In this prospective, single-arm, open-label clinical trial, investigators enrolled 218 adults with chronic HCV genotype 1, 4, or 6 and HIV coinfection to receive treatment with elbasvir-grazoprevir once daily for 12 weeks.[16] Among those enrolled, 86% had genotype 1a or 1b infection, and 16% had compensated cirrhosis. The overall SVR12 rate was 96% (210 of 218) by primary analysis, with the breakdown by genotype showing 97% for those with genotype 1a, 96% for genotype 1b, and 96% for genotype 4. All study participants with cirrhosis achieved an SVR12.[16]
- **Glecaprevir-Pibrentasvir** (EXPEDITION-2): This open-label, dual-arm, phase 3 trial enrolled adults with HCV (genotype 1, 2, 3, 4, 5, or 6) and HIV coinfection to receive HCV treatment with glecaprevir-pibrentasvir. The 137 participants without cirrhosis were assigned 8 weeks of HCV treatment, and the 16 individuals with compensated cirrhosis received 12 weeks.[22] Most participants (63%) had HCV genotype 1, and 18% were treatment-experienced (16% previously treated with an interferon-based regimen and 2% with a sofosbuvir-based regimen).[22] All but 10 participants were taking raltegravir, dolutegravir, or rilpivirine as the antiretroviral therapy anchor drug. The overall SVR12 rate was 98% (150 of 153); one individual with HCV genotype 3 and cirrhosis experienced on-treatment HCV virologic breakthrough.[22]
- **Ledipasvir-Sofosbuvir** (ION-4): In this phase 3, open-label, multicenter study, investigators enrolled 335 adults with HCV genotype 1 or 4 who had HIV coinfection to receive a 12-week course of ledipasvir-sofosbuvir.[15] Enrollment included HCV treatment-naïve and HCV treatment-experienced individuals, including those without cirrhosis and those with compensated cirrhosis. The HIV enrollment criteria required an HIV RNA level less than 50 copies/mL and a CD4 count greater than 100 cells/mm^3; antiretroviral regimens could include tenofovir DF-emtricitabine plus either efavirenz, rilpivirine, or raltegravir. Overall, 96% (321 of 335) of the study participants who received HCV treatment achieved an SVR12.[15] The results were similar regardless of prior treatment status or the presence of cirrhosis.
- **Ledipasvir-Sofosbuvir** (NIAID ERADICATE): This phase 2 trial investigated the open-label use of ledipasvir-sofosbuvir for 12 weeks in 50 treatment-naïve adults with HCV (genotype 1) and HIV coinfection.[23] Among the 50 participants enrolled, 13 were not taking antiretroviral therapy, and 37 were receiving antiretroviral therapy (the antiretroviral medications that were allowed included tenofovir DF-emtricitabine, efavirenz, and rilpivirine). Overall, 98% (49 of 50) of the participants achieved an SVR12.[23]
- **Sofosbuvir-Velpatasvir** (ASTRAL-5): The ASTRAL-5 study was a single-arm, open-label, phase 3 trial of sofosbuvir-velpatasvir for 12 weeks in adults with HCV and HIV coinfection.[18] The study enrolled 106 individuals with HCV genotype 1, 2, 3, 4, or 6; among those enrolled, 18% had compensated cirrhosis and 29% were treatment-experienced.[18] The mean CD4 count was 583 cells/mm^3 and all participants had suppressed HIV RNA levels. Various antiretroviral regimens, including those containing tenofovir DF and/or boosting agents (cobicistat or ritonavir), were permitted. The overall SVR12 rate was 95% (101 of 106); two viral relapses occurred, both in persons with genotype 1a

HCV.[18] No participants experienced HIV viral rebound during HCV treatment.[18] The presence of cirrhosis, or treatment experience, did not appear to influence treatment response. Creatinine clearance was lower among participants taking both tenofovir DF and a boosting agent, but the creatinine clearance remained relatively stable over time in all groups.[18]

- **Sofosbuvir-Velpatasvir-Voxilaprevir** (RESOLVE): The RESOLVE study was a single-arm, open-label, phase 2b trial of sofosbuvir-velpatasvir-voxilaprevir for 12 weeks in 77 adults with or without HIV coinfection who had experienced treatment failure with prior DAA therapy.[24] The study had high proportionate enrollment among men (83%), persons of Black race (86%), those with HCV genotype 1a (75%), and persons with prior treatment with ledipasvir-sofosbuvir (89%).[24] Among all study participants, 40% (31 of 77) had compensated cirrhosis, and 17 had HIV coinfection; all persons with HIV were taking antiretroviral therapy.[24] Overall, in an intent-to-treat analysis, 91% (70 of 77) achieved an SVR12, and only one of the nonresponders had a viral relapse.[24] Of those with HIV, 82% (14 of 17) achieved an SVR12.[24]

Treatment of HCV in Persons with HIV Coinfection

Recommendations in AASLD-IDSA Guidance

The AASLD-IDSA HCV Guidance recommends using the same general approach for treating HCV in persons with HIV coinfection as with HCV monoinfection, but notes the importance of recognizing and managing potential drug interactions between HCV medications and HIV antiretroviral medications.[13,25] Persons with HIV who are treatment naïve and otherwise meet clinical criteria are also eligible for the simplified treatment approach, and this involves treatment with either glecaprevir-pibrentasvir or sofosbuvir-velpatasvir; HIV coinfection is not a reason for exclusion from this HCV treatment algorithm.[13,25] In most instances, the AASLD-IDSA HCV Guidance recommends using the same HCV treatment regimens and duration for persons with HIV coinfection as for those with HCV monoinfection, with one exception (as outlined below) that requires a longer treatment duration for persons with HIV coinfection than those with HCV monoinfection due to insufficient data on the efficacy of these 8-week regimens among individuals with HIV coinfection.[13]

- **Treatment Naïve, without Cirrhosis, Genotypes 1a and 1b**: The recommended treatment duration for the ledipasvir-sofosbuvir regimen is 8 weeks for persons with HCV monoinfection and baseline HCV RNA less than 6 million IU/mL, but the duration should be 12 weeks for persons with HCV-HIV coinfection, regardless of their baseline HCV RNA level.[26]

Recommendations in HIV Opportunistic Infections Guidelines

The recommendations in the Adult and Adolescent OI Guidelines are consistent with the AASLD-IDSA HCV Guidance, but note the strength of recommendation for HCV treatment with 8 weeks of glecaprevir-pibrentasvir is weaker for persons with HIV and cirrhosis due to the lack of prospective trial data to support this treatment duration in this subpopulation.[13,28] Although not directly addressed by either of these guidelines, the same could be said for persons with HCV genotype 5 or 6, with or without cirrhosis, since the EXPEDITION 8 trial, where genotypes 5 and 6 were studied, excluded individuals with HIV.[29] In addition, the Adult and Adolescent OI Guidelines note this simplified treatment approach is not recommended for some individuals, as outlined below.[28]

Table 1.

Characteristics of People with HIV for Whom Simplified Hepatitis C Virus Treatment Is Not Recommended[a]

• Prior HCV treatment (reinfection after prior successful therapy is **not** an exclusion)
• Decompensated cirrhosis[b]
• TDF-containing regimen with an eGFR <60mL/min
• On efavirenz, etravirine, nevirapine, or boosted HIV-1 protease inhibitors[c]
• Untreated chronic HBV infection
• Pregnancy

[a] People with HIV and HCV infection who meet these exclusion criteria should be treated for HCV following standard approaches in the AASLD/IDSA Guidance (see the AASLD/IDSA HCV Guidance).
[b] Including, but not limited to, current or prior variceal bleeding, ascites, or hepatic encephalopathy
[c] People with HIV on boosted protease inhibitors are not eligible for treatment with glecaprevir-pibrentasvir and may require on-treatment monitoring.
Key: eGFR = estimated glomerular filtration rate; HBV = hepatitis B virus; HCV = hepatitis C virus; TDF = tenofovir disoproxil fumarate

Source:

- Panel on Opportunistic Infections in Adults and Adolescents with HIV. Guidelines for the prevention and treatment of opportunistic infections in adults and adolescents with HIV: recommendations from the Centers for Disease Control and Prevention, the National Institutes of Health, and the HIV Medicine Association of the Infectious Diseases Society of America. Hepatitis C virus. Last Updated: January 18, 2023. [HIV.gov]

Treatment of HIV in Persons with HCV Coinfection

The Adult and Adolescent Antiretroviral Therapy Guidelines emphasize the following key points on treating HIV with antiretroviral therapy for persons with HCV coinfection:[30]

- Antiretroviral therapy is recommended for all persons with HIV.
- Antiretroviral treatment for HIV may slow the progression of HCV-related liver disease and reduce the risk of liver-related morbidity.
- Treatment of HIV with antiretroviral therapy should be initiated for all persons with HIV and HCV coinfection, regardless of the CD4 cell count and fibrosis stage.
- If treatment for both HIV and HCV is indicated, the selection of the treatment regimens should consider potential drug interactions and whether the recommended DAA treatment should be given for a longer than standard duration on account of HIV coinfection.
- Individuals with HIV and HCV coinfection should be screened for prior or active HBV infection with a hepatitis B surface antigen, hepatitis B surface antibody, and hepatitis B core antibody. Those with chronic HBV in addition to HIV and HCV coinfection should receive antiretroviral therapy that is active against HBV prior to starting HCV treatment, ideally with a regimen that includes either tenofovir DF or tenofovir alafenamide in combination with emtricitabine or lamivudine.
- Treatment of HCV with DAAs should not be withheld solely based on a perceived lack of adherence or due to untreated HIV infection.
- Because of the increased risk of hepatotoxicity after initiating antiretroviral therapy in persons with HCV confection, evaluation of alanine aminotransferase (ALT) and aspartate aminotransferase (AST) levels should take place 4 to 8 weeks after starting antiretroviral therapy and be repeated 6 to 12 months later. Elevated values will require more frequent monitoring.

Drug Interactions with HIV-HCV Coinfection Treatment

Resources for Drug Interaction

There are very few significant drug interactions between commonly used DAAs with nucleoside reverse transcriptase inhibitors (NRTIs) or integrase strand transfer inhibitors (INSTIs). There are, however, several important drug interactions between DAAs and regimens that contain a protease inhibitor (PI) and/or a non-nucleoside reverse transcriptase inhibitor (NNRTI). For resources on drug interactions that may occur with HIV antiretroviral medications and HCV treatment medications, access the following sites:

- AASLD-IDSA HCV Guidance: Patients with HIV/HCV Coinfection[13]
    - Drug Interactions Between Direct-Acting Antivirals and Antiretroviral Drugs-Recommended Regimens
- HHS Adult and Adolescent Antiretroviral Therapy Guidelines: Drug-Drug Interaction[30,31]
    - Concomitant Use of Selected Antiretroviral Drugs and Hepatitis C Virus Direct-Acting Antiviral Drugs for Treatment of Hepatitis C Virus in Adults with HIV
- University of Liverpool, England
    - HEP Drug Interactions
    - HIV Drug Interactions

Drug Interaction Summaries

The following provides key points related to potential drug interactions between HCV medications (DAAs and ribavirin) and HIV antiretroviral medications. The first section will address interactions from the perspective of the antiretroviral medication classes with the recommended DAA regimens and the second section will address interactions from the perspective of the DAA medications.

Antiretroviral Medication: Key Points

The following summarizes key points with the use of antiretroviral medications with the five recommended AASLD-IDSA HCV regimens: elbasvir-grazoprevir, glecaprevir-pibrentasvir, ledipasvir-sofosbuvir, sofosbuvir-velpatasvir, and sofosbuvir-velpatasvir-voxilaprevir.[13,31,32,33,34]

- **NRTIs**: Abacavir, emtricitabine, lamivudine, and tenofovir alafenamide can be used safely with all recommended HCV DAA regimens. Caution should be used with tenofovir DF in combination with any regimen that includes sofosbuvir plus an NS5A inhibitor (ledipasvir-sofosbuvir, sofosbuvir-velpatasvir, or sofosbuvir-velpatasvir-voxilaprevir); the NS5A inhibitor in these regimens can increase tenofovir DF drug levels.
- **NNRTIs**: Doravirine and rilpivirine can be used safely with all recommended HCV regimens. Efavirenz and etravirine should not be used with any of the recommended HCV treatment regimens, except for ledipasvir-sofosbuvir. The use of efavirenz or etravirine with DAAs can reduce DAA concentrations and may reduce the HCV therapeutic efficacy.
- **INSTIs**: Bictegravir, dolutegravir, and raltegravir can be used safely with all recommended HCV regimens. Cobicistat-boosted elvitegravir should not be administered with elbasvir-grazoprevir, nor should it be administered with the combination of tenofovir DF with ledipasvir-sofosbuvir. Caution should be used if using cobicistat-boosted elvitegravir with glecaprevir-pibrentasvir, sofosbuvir-velpatasvir, or sofosbuvir-velpatasvir-voxilaprevir, especially if concomitantly given with tenofovir DF.
- **PIs**: All ritonavir- or cobicistat-boosted protease inhibitors should be used with caution with all recommended HCV treatment regimens. In addition, boosted atazanavir, boosted darunavir, and boosted lopinavir should not be used with elbasvir-grazoprevir or glecaprevir-pibrentasvir. Further, boosted atazanavir and boosted lopinavir should not be used with sofosbuvir-velpatasvir-voxilaprevir. Unboosted atazanavir could be used with ledipasvir-sofosbuvir or sofosbuvir-velpatasvir.
- **Entry Inhibitors CCR5 Antagonist**: The entry inhibitors ibalizumab (postattachment inhibitor)

maraviroc (CCR5 antagonist), and enfuvirtide (fusion inhibitor) do not have any significant drug interactions with DAA medications. Coadministration of fostemsavir (attachment inhibitor) with either elbasvir-grazoprevir or sofosbuvir-velpatasvir-voxilaprevir may result in an increase of grazoprevir or voxilaprevir levels.

- **Long-Acting Injectable Antiretroviral Therapy** (cabotegravir and rilpivirine): The injectable antiretroviral combination of cabotegravir and rilpivirine has not been studied extensively with DAAs, but based on what is known with cabotegravir and rilpivirine, no anticipated drug interaction is expected with currently recommended HCV treatment regimens.

HCV DAA Medicaton Drug Interactions: Key Points

The following provides key points regarding the use of DAAs used to treat HCV in persons with HIV coinfection.

- **Elbasvir-Grazoprevir**: Grazoprevir is a substrate of the OATP1B1/3 transporters and therefore contraindicated for use with OATP1B1/3 inhibitors such as the HIV protease inhibitors or cobicistat-containing regimens that can increase grazoprevir drug levels and the risk of hepatotoxicity. Both elbasvir and grazoprevir are metabolized by the CYP3A levels and levels may decrease if given with CYP3A inducers, such as efavirenz and etravirine. Coadministration of elbasvir-grazoprevir is contraindicated with all protease inhibitors; the NNRTIs efavirenz, etravirine, nevirapine, and any cobicistat-containing regimen. The use of elbasvir-grazoprevir with fostemsavir should be avoided, if possible, due to increased grazoprevir levels.
- **Glecaprevir-Pibrentasvir**: Glecaprevir is a substrate of OATP1B1/3, p-glycoprotein (P-gp), and breast cancer resistance protein (BCRP), as well as an inhibitor of these transporters. The levels of glecaprevir are increased when used with the HIV protease inhibitors atazanavir, lopinavir, or ritonavir.[35] In addition, the use of atazanavir with glecaprevir-pibrentasvir has been associated with an increased risk of ALT elevation; therefore, these medications should not be used together. Cobicistat-containing regimens may also increase ALT levels, but to a lesser extent, and monitoring for hepatotoxicity is advised. Coadministration of glecaprevir-pibrentasvir with inducers of CYP3A, such as efavirenz or etravirine may result in lower plasma concentrations of glecaprevir and pibrentasvir. Glecaprevir-pibrentasvir is contraindicated for use with atazanavir (with or without ritonavir or cobicistat). In addition, glecaprevir-pibrentasvir is not recommended for coadministration with darunavir, lopinavir, tipranavir, ritonavir, efavirenz, etravirine, or nevirapine.
- **Ledipasvir-Sofosbuvir**: The NS5A inhibitor ledipasvir is not metabolized by the cytochrome p450 system, but it is both a substrate and an inhibitor of p-glycoprotein and BCRP transporters. Ledipasvir increases tenofovir AUC (area under the plasma drug concentration-time curve) levels by 40 to 98% when concomitantly given with tenofovir DF and either rilpivirine or efavirenz. Concurrent use of ledipasvir with tenofovir DF and an HIV protease inhibitor (or cobicistat) has not been adequately studied, but there is concern that tenofovir levels may increase substantially with this combination. Because of this concern and lack of data, the use of ledipasvir with the combination of tenofovir DF and cobicistat- or ritonavir-boosted HIV protease inhibitors should, if possible, be avoided. For similar reasons, ledipasvir-sofosbuvir should not be used with cobicistat, elvitegravir, or tipranavir. Monitoring for tenofovir DF nephrotoxicity or switching to tenofovir alafenamide should be considered. Ledipasvir-sofosbuvir should not be used in persons with HIV infection on tenofovir DF if the baseline creatinine clearance is less than 60 mL/min. Ledipasvir does not have significant drug interactions with tenofovir alafenamide.
- **Ribavirin**: Significant and serious toxicities can occur with the simultaneous use of ribavirin and certain HIV nucleoside reverse transcriptase inhibitors. The use of ribavirin with didanosine, stavudine, or zidovudine should be avoided. In addition, concurrent use of ribavirin and zidovudine should also be avoided because of additive hematologic toxicity and increased risk of severe anemia with this combination.

- **Sofosbuvir-Velpatasvir**: Drugs that are inducers of P-gp and/or moderate to potent inducers of CYP2B6, CYP2C8, or CYP3A4 have the potential to decrease plasma concentrations of sofosbuvir and/or velpatasvir. For this reason, efavirenz and etravirine, as well as tipranavir, are contraindicated for concurrent use. Velpatasvir, when given with tenofovir DF, can increase tenofovir levels, so caution is advised when using this combination, especially in persons taking additional medications that may increase tenofovir levels or in persons who have an increased risk for nephrotoxicity. An increase in tenofovir levels can occur with coadministration of sofosbuvir-velpatasvir and tenofovir alafenamide, although to a lesser extent than with tenofovir DF.
- **Sofosbuvir-Velpatasvir-Voxilaprevir**: Drugs that are inducers of P-gp and/or moderate to potent inducers of CYP2B6, CYP2C8, or CYP3A4 have the potential to decrease plasma concentrations of sofosbuvir and/or velpatasvir. Therefore, efavirenz, etravirine, and tipranavir are not recommended for concurrent use with sofosbuvir-velpatasvir-voxilaprevir. In addition, atazanavir and lopinavir are not recommended for use with sofosbuvir-velpatasvir-voxilaprevir. The same concerns related to tenofovir DF and velpatasvir discussed above should be considered when using this combination. The use of elbasvir-grazoprevir with fostemsavir should be avoided, if possible, due to increased voxilaprevir levels.

The following table summarizes the key drug interactions between HIV antiretroviral medications and the two combination medications (glecaprevir-pibrentasvir and sofosbuvir-velpatasvir), that are recommended in the HCV simplified treatment algorithm.[25,28,36,37] Table 2.

Summary of Major Drug Interactions Between HIV and HCV Antivirals

HIV Antiretrovirals	Glecaprevir-Pibrentasvir	Sofosbuvir-Velpatasvir
Efavirenz, Etravirine, Nevirapine, and other strong CYP3A4 and P-gp inducers	Significant decrease in glecaprevir and pibrentasvir concentrations **(avoid)**	Significant decrease in velpatasvir concentrations **(avoid)**
Protease inhibitor/ritonavir, Protease inhibitor/cobicistat, unboosted Atazanavir	Significant increase in glecaprevir and pibrentasvir concentrations **(avoid)**	Boosted PIs may increase velpatasvir concentrations, but no significant adverse events in clinical trial Coadministration allowed
Tenofovir DF, Tenofovir alafenamide	Coadministration allowed	Tenofovir alafenamide preferred If Tenofovir DF is used with boosted protease inhibitors if GFR <60 mL/min, monitoring is recommended.
Rilpivirine, Doravirine, Elvitegravir-cobicistat,	Coadministration allowed	Coadministration allowed

HIV Antiretrovirals	Glecaprevir-Pibrentasvir	Sofosbuvir-Velpatasvir
Raltegravir, Bictegravir, Dolutegravir, Abacavir, Emtricitabine, Lamivudine, Maraviroc		
Key: CYP = cytochrome P450; P-gp = p-glycoprotein; GFR = glomerular filtration rate		

Source:

- Panel on Opportunistic Infections in Adults and Adolescents with HIV. Guidelines for the prevention and treatment of opportunistic infections in adults and adolescents with HIV: recommendations from the Centers for Disease Control and Prevention, the National Institutes of Health, and the HIV Medicine Association of the Infectious Diseases Society of America. Hepatitis C virus. Last Updated: January 18, 2023. [HIV.gov]

Summary Points

- In persons with chronic HCV, coinfection with HIV can accelerate the progression of hepatic fibrosis and increase the risk of liver-related complications. Therefore, treatment of both HIV and HCV should have high priority in persons with HIV and HCV coinfection.
- The availability of highly effective, convenient, and safe DAA regimens has changed the HCV treatment landscape for persons with HIV and HCV coinfection. Multiple studies using DAA HCV treatment regimens have demonstrated comparable SVR12 rates in persons with HIV and HCV coinfection as in those with HCV monoinfection.
- The recommended HCV treatment approach for persons with HIV and HCV coinfection as with HCV monoinfection is the same, except the 8-week treatment regimens should be extended to 12-week regimens in a few specific situations.
- Special consideration should be given to monitoring and managing HIV antiretroviral and HCV DAA drug interactions.
- Antiretroviral therapy is recommended for all persons with HIV, including those with HIV and HCV coinfection. Treatment of HIV may slow liver disease progression in persons with HIV and HCV coinfection.

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Figures

Figure 1 Progression to Cirrhosis in Patients with HCV Monoinfection and HIV-HCV Coinfection

This graph shows accelerated progression to cirrhosis in patients with HIV and HCV coinfection when compared with those with HCV monoinfection.

Source: Di Martino V, Rufat P, Boyer N, et al. The influence of human immunodeficiency virus coinfection on chronic hepatitis C in injection drug users: a long-term retrospective cohort study. Hepatology. 2001;34:1193-9.

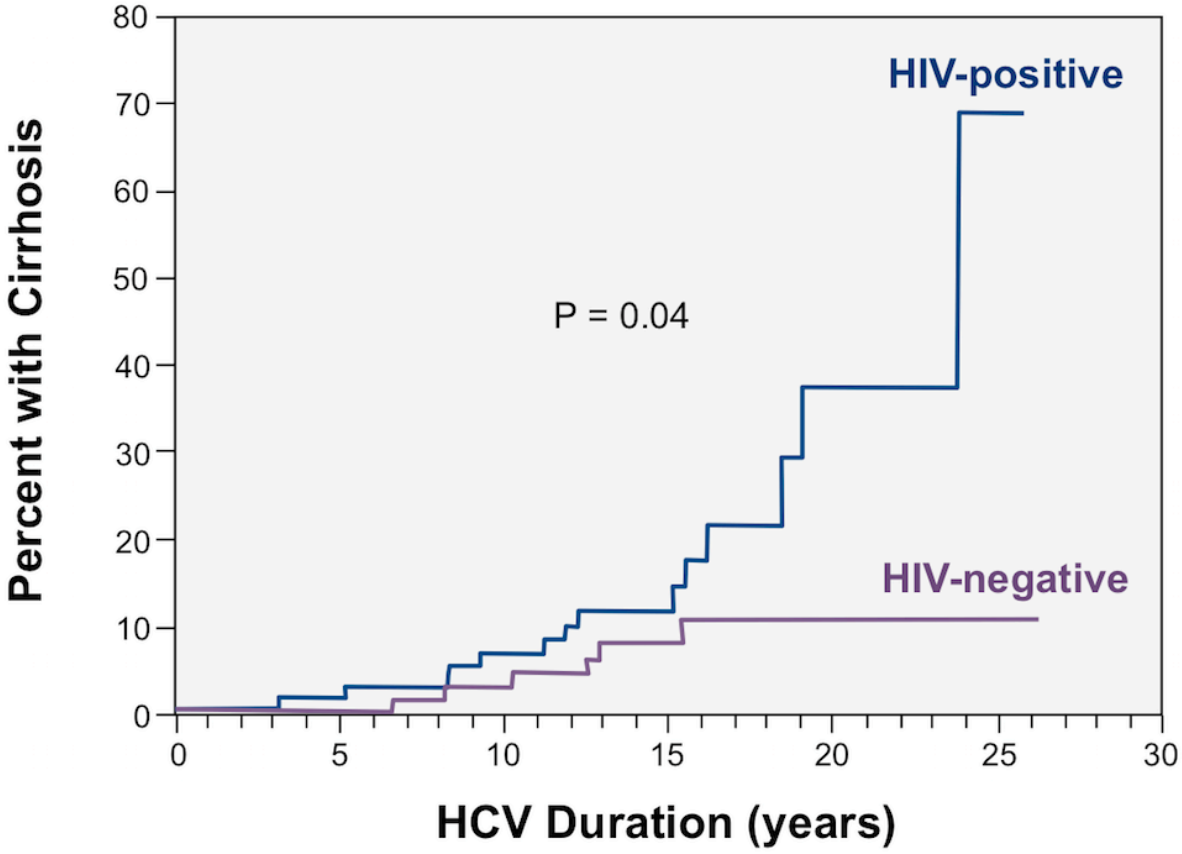

Figure 2 SVR Rates in Treatment-Naïve Adults with HIV and HCV Coinfection versus HCV Monoinfection

SVR Rates with GT 1 HCV-HIV Coinfection and HCV Monoinfection				
Regimen (12 weeks)	Genotype 1			
	HCV-HIV Coinfection		HCV Monoinfection	
	Study	SVR	Study	SVR
Elbasvir-Grazoprevir	C-EDGE Coinfection	95%	C-EDGE TN	95%
Glecaprevir-Pibrentasvir	EXPEDITION-2	98%	ENDURANCE-1	99%
Ledipasvir-Sofosbuvir	ION-4	96%	ION-1	99%
Sofosbuvir-Velpatasvir	ASTRAL-5	95%	ASTRAL-1	98%

Table 1.

Characteristics of People with HIV for Whom Simplified Hepatitis C Virus Treatment Is Not Recommended[a]

• Prior HCV treatment (reinfection after prior successful therapy is **not** an exclusion)
• Decompensated cirrhosis[b]
• TDF-containing regimen with an eGFR <60mL/min
• On efavirenz, etravirine, nevirapine, or boosted HIV-1 protease inhibitors[c]
• Untreated chronic HBV infection
• Pregnancy

[a] People with HIV and HCV infection who meet these exclusion criteria should be treated for HCV following standard approaches in the AASLD/IDSA Guidance (see the AASLD/IDSA HCV Guidance).
[b] Including, but not limited to, current or prior variceal bleeding, ascites, or hepatic encephalopathy
[c] People with HIV on boosted protease inhibitors are not eligible for treatment with glecaprevir-pibrentasvir and may require on-treatment monitoring.
Key: eGFR = estimated glomerular filtration rate; HBV = hepatitis B virus; HCV = hepatitis C virus; TDF = tenofovir disoproxil fumarate

Source:

- Panel on Opportunistic Infections in Adults and Adolescents with HIV. Guidelines for the prevention and treatment of opportunistic infections in adults and adolescents with HIV: recommendations from the Centers for Disease Control and Prevention, the National Institutes of Health, and the HIV Medicine Association of the Infectious Diseases Society of America. Hepatitis C virus. Last Updated: January 18, 2023. [HIV.gov]

Table 2.

Summary of Major Drug Interactions Between HIV and HCV Antivirals

HIV Antiretrovirals	Glecaprevir-Pibrentasvir	Sofosbuvir-Velpatasvir
Efavirenz, Etravirine, Nevirapine, and other strong CYP3A4 and P-gp inducers	Significant decrease in glecaprevir and pibrentasvir concentrations **(avoid)**	Significant decrease in velpatasvir concentrations **(avoid)**
Protease inhibitor/ritonavir, Protease inhibitor/cobicistat, unboosted Atazanavir	Significant increase in glecaprevir and pibrentasvir concentrations **(avoid)**	Boosted PIs may increase velpatasvir concentrations, but no significant adverse events in clinical trial Coadministration allowed
Tenofovir DF, Tenofovir alafenamide	Coadministration allowed	Tenofovir alafenamide preferred If Tenofovir DF is used with boosted protease inhibitors if GFR <60 mL/min, monitoring is recommended.
Rilpivirine, Doravirine, Elvitegravir-cobicistat, Raltegravir, Bictegravir, Dolutegravir, Abacavir, Emtricitabine, Lamivudine, Maraviroc	Coadministration allowed	Coadministration allowed
Key: CYP = cytochrome P450; P-gp = p-glycoprotein; GFR = glomerular filtration rate		

Source:

- Panel on Opportunistic Infections in Adults and Adolescents with HIV. Guidelines for the prevention and treatment of opportunistic infections in adults and adolescents with HIV: recommendations from the Centers for Disease Control and Prevention, the National Institutes of Health, and the HIV Medicine Association of the Infectious Diseases Society of America. Hepatitis C virus. Last Updated: January 18, 2023. [HIV.gov]