

**OREGON PUBLIC HEALTH DIVISION • OREGON HEALTH AUTHORITY**

**A TALE OF TWO VIRUSES: HEPATITIS C AND HIV COINFECTION**

**BOOK THE FIRST**

In the United States, approximately 4 million people are infected with hepatitis C virus (HCV), and 1 million are infected with HIV;\* approximately 300,000 have both.<sup>1,2</sup> In Oregon we estimate that about 50,000 are infected with HCV and 6,000–7,000 with HIV. According to our reportable disease data, *at least* 8% of Oregonians with HIV – 500 people – also have HCV.

**RECALL(ED TO) LIFE CYCLE**

One pathogen is a retrovirus that primarily affects lymphocytes and the other a flavivirus that infects hepatocytes, but HIV and HCV have interesting similarities (box).<sup>3</sup> In particular, both are high-replication RNA viruses, a shared feature that results in tremendous capacity for mutation. This makes them difficult to treat, and currently, impossible to prevent through vaccination. Bloodborne or sexual transmission occurs for both, though sexual transmission is relatively uncommon for HCV. Infection with either is often asymptomatic in the acute phase and characterized by an initial viremic burst followed by prolonged periods of relatively fixed levels of virus. Each has a serological ‘window period’ in which viral antigen is present but antibodies are not; in the case of HCV, this period can last up to 12 weeks.

HCV infection is endemic among networks of people who inject drugs, probably because it is 10 times more likely than HIV to be transmitted after a single bloodborne exposure. Consequently, HCV is often acquired before HIV in people who inject drugs, and it is vastly more prevalent among HIV-infected people who have used injection drugs than among people who are thought to have acquired their HIV infection via sexual transmission (table). Sexual transmission of HCV can occur, though rarely. HIV infection does appear to increase risk of sexual

\* [www.cdc.gov/hiv/resources/factsheets/us.htm](http://www.cdc.gov/hiv/resources/factsheets/us.htm)

acquisition of HCV among men who have sex with men, perhaps because of HIV-related enteropathy.<sup>3</sup>

HIV and HCV Comparison	
<u>Similarities</u>	
• High-replication, enveloped RNA viruses, frequent mutation	
• Treatable; not preventable through vaccination	
• Bloodborne, maternal-child, and sexual transmission	
• Frequently asymptomatic acute phase followed by prolonged latency and relative stasis of viral load	
• Spontaneous clearance occurs (though much rarer for HIV)	
• T-cell response determines clearance and T-cell “exhaustion” a likely cause of deterioration	
<u>Differences</u>	
• Typical route of transmission: HCV: bloodborne; HIV: sexual/ bloodborne (HCV is 10-fold more easily transmitted after bloodborne exposure than HIV)	
• Viral loads ~10 <sup>3</sup> higher in HCV infection	
• Taxonomy: HIV:retrovirus; HCV:flavivirus	
• Target: HCV:hepatocytes; HIV:CD4+ T-lymphocytes	
• Serodiagnostic window: HCV 3 – 15 weeks; HIV 2 – 6 weeks	

**WORST OF TIMES**

HCV is a bad actor, regardless of HIV status. Few people who acquire HCV ever completely clear it from their blood, and 60%–80% go on to develop chronic hepatitis. Although most are initially asymptomatic or only mildly ill, by 20 years after infection cirrhosis develops in 15%–30% of patients – a percentage that increases over time. Thus, approximately 1 in 4 people with HCV develop cirrhosis within 20 years.

In people coinfecting with HIV, HCV outcomes are worse: higher likelihood of viral persistence, faster progression of fibrosis, faster hepatic decompensation, and reduced viral response after treatment (figure, *verso*). Conversely,

**Table. Percent of HIV cases with reported HCV infection, Oregon 2006–2009**

	HIV Cases	Percent with HCV
<b>Sex</b>		
Male	899	7
Female	134	15
<b>Age group (yrs.)</b>		
<40	631	6
40–49	253	12
>49	151	7
<b>Race/ethnicity</b>		
Hispanic	182	7
White	692	8
Black	61	9
<b>HIV-related behavior</b>		
Sex with men (men)	622	3
Any injection drug use	156	33

“the effect of HCV infection on HIV disease progression and immune reconstitution is uncertain although not likely to be clinically relevant.” Some HIV treatments, however, may be hepatotoxic.<sup>†</sup>

In Oregon, chronic hepatitis—mostly HCV—is an increasing factor in mortality of HIV-infected people who die. From 2006 through 2009, chronic hepatitis was among the multiple causes of death for 15 (5%) of 279 HIV-infected people who died in Oregon. As people live longer with HIV infection, and monitoring both diseases improves, we expect this proportion to increase.

**BEST OF TIMES?**

Effective treatments are available for both HIV and HCV infections.<sup>4</sup> Generally, antiretroviral therapy for patients with HIV and HCV can be approached as for mono-infected patients. In the U.S., the average life expectancy after HIV diagnosis went from 10.5 years in 1996 to 22.5 years in 2005, and 40% of participants with both HIV and HCV in the APRICOT (!) trial achieved sustained viral suppression of HCV after treatment for HCV with pegylated interferon

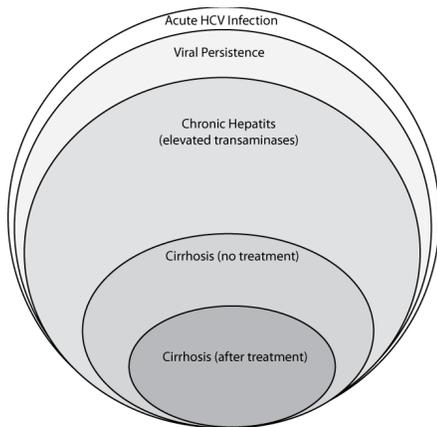
† <http://hivinsite.ucsf.edu/InSite?page=md-agl-hcv>



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**Figure. Proportional HCV outcomes in people with HIV**



alpha-2a and ribavirin.<sup>5,6</sup> Because cirrhosis takes many years to develop, many trials of HCV treatment use sustained viral response at 72 weeks as a measure of effective treatment, with the assumption that progression to cirrhosis is less likely in patients with sustained viral response. Cost effectiveness modeling suggests that treatment with interferon alfa and ribavirin generally costs less than \$40,000 per quality-adjusted life year saved, a figure comparable to other accepted medical therapies. So, if as it presently appears, 40% of expected cirrhosis cases in HIV-HCV coinfecting people can be averted with treatment, it is important to treat HCV in people co-infected with HIV.

**ECHOES FROM A DISTANCE THAT RUMBLE MENACINGLY: CONSIDERATIONS FOR HCV TREATMENT?**

Caution should be used when prescribing antiretroviral agents with the greatest risk of drug-induced liver

injury or steatosis, or with the following patients:

- Women who are pregnant or unwilling to use birth control
- Advanced immunosuppression uncontrolled on antiretroviral therapy
- Hepatic decompensation (coagulopathy, hyperbilirubinemia, encephalopathy, ascites)
- Severe uncontrolled co-morbid condition such as cancer or cardiopulmonary disease
- Severe depression with suicidal ideation
- Significant hematologic abnormality, uncorrected
- Renal insufficiency
- Sarcoidosis
- Active, uncontrolled autoimmune condition

**REPRESSION IS THE ONLY LASTING PHILOSOPHY**

Advice for patients infected with HIV, HCV or both:

- Avoid injecting drugs
- Avoid sharing needles, syringes, cottons, “works”
- Use condoms
- Know sex and needle partners’ HIV and HCV status
- If positive for one, (HIV or HCV) get tested for the other regularly
- Seek treatment early if infected (early treatment more likely to result in sustained viral response)
- Inform sex and injecting partners

**RESOURCES**

For patients

- CAREAssist (HIV care and treatment): 800-805-2313 and [www.oregon.gov/DHS/ph/hiv/careassist/index.shtml](http://www.oregon.gov/DHS/ph/hiv/careassist/index.shtml)
- HIV & Hepatitis C Resource Guide: 503-988-3030 and [www.oregonaidshotline.com](http://www.oregonaidshotline.com)

For health care providers

- Research + Education Group (Northwest AIDS Education and Training, Portland Office): 503-229-8428 and <http://depts.washington.edu/nwaetc/offices/oregon.html>
- National HIV/AIDS Treatment Hotline: 866-448-4635 and [www.projectinform.org](http://www.projectinform.org)

**FOR MORE INFORMATION**

Visit the Public Health Division’s HIV/Sexually Transmitted Disease/Tuberculosis web site [www.oregon.gov/DHS/ph/hst/index.shtml](http://www.oregon.gov/DHS/ph/hst/index.shtml).

**REFERENCES**

1. Armstrong GL, Wasley A, Simard EP, et al. The prevalence of hepatitis C virus infection in the United States, 1999 through 2002. *Ann Intern Med* 2006;144:705–14.
2. Bonacini M, Puoti M. Hepatitis C in patients with human immunodeficiency virus infection: Diagnosis, natural history, meta-analysis of sexual and vertical transmission, and therapeutic issues. *Arch Intern Med* 2000;160:3365–73.
3. Kim AY, Chung RT. Coinfection with HIV-1 and HCV—a one-two punch. *Gastroenterology* 2009;137:795–814.
4. 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. December 1, 2009; 1–161. Available at [www.aidsinfo.nih.gov/ContentFiles/AdultandAdolescentGL.pdf](http://www.aidsinfo.nih.gov/ContentFiles/AdultandAdolescentGL.pdf). Accessed December 21, 2010.
5. Harrison KM, Song R, Zhang X. Life expectancy after HIV diagnosis based on national HIV surveillance data from 25 states, United States. *J Acquir Immune Defic Syndr* 2010;53:124–30.
6. Torriani FJ, Rodriguez-Torres M, Rockstroh JK, et al. Peginterferon alfa-2a plus ribavirin for chronic hepatitis C virus infection in HIV-infected patients. *N Engl J Med* 2004;351:438–50.
7. Centers for Disease Control and Prevention. Guidelines for prevention and treatment of opportunistic infections in HIV-infected adults and adolescents. *MMWR* 2009;58(No. RR-4).