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# Dangerous Exposure

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Although Hepatitis B and C are the main offenders when it comes to hepatocellular carcinoma, there are actually a total of five viruses, labeled A through E.

Hepatitis A is an acute condition, so most people get better on their own within a few weeks without any long-term ill effects. Found in feces of infected people, transmission typically occurs through consumption of contaminated food or water. A vaccine is the best protection against hepatitis A and is recommended for people traveling in underdeveloped countries. The hepatitis E virus is spread in much the same way as hepatitis A. It's rare in the United States, and infected people generally get better over time.

Hepatitis D can occur simultaneously with hepatitis B, known as a co-infection, or as a so-called superinfection in people already infected with chronic HBV, which can lead to cirrhosis.

Studies estimate 15 percent of HCC diagnoses in the United States are the result of HBV, 47 percent result from HCV, 5 percent result from co-infection of both viruses and the remaining 33 percent of HCC cases have non-viral causes.

A hepatitis B vaccine has been available since 1982, and infants and children in the United States are routinely vaccinated. The 1.4 million Americans with chronic HBV need lifelong monitoring and screening. Many patients are healthy carriers of HBV, and although they don't have liver damage, they can transmit the virus to others through exchange of blood or bodily fluids during unprotected sex, sharing of drug needles or during birth, when an infected mother transmits the virus to her newborn.

Several antiviral drugs are available to treat chronic HBV, including interferon alfa, adefovir dipivoxil and lamivudine. The various subtypes of HBV can develop drug-resistant mutations, but in most cases, the immune system can mount a strong enough attack to rid the body of HBV. Rarely—1 to 5 percent of the time—HBV can lead to cancer.

Things are trickier with HCV. No vaccine currently exists to protect against the virus, which wasn't discovered until 1989. HCV is transmitted through the same

methods as HBV, though HCV is rarely passed from mother to newborn. Countless people who received blood transfusions before the early 1990s—when HCV screening of blood products began—may have been unknowingly infected.

While HBV is more common worldwide than HCV—up to 400 million versus 170 million—HCV dominates hepatitis cases in the United States, with an estimated four million Americans infected with HCV. For most, the virus becomes chronic, and of those, 10 to 25 percent will develop HCC. HCV-caused liver cancer can develop more quickly than cancer caused by HBV, taking two to three decades as opposed to two to seven decades—often with no symptoms of infection. When symptoms of HCV do occur, they may include jaundice, fatigue, dark urine, abdominal pain, nausea and loss of appetite. People with chronic HCV increase their risk of cirrhosis and liver cancer if they excessively consume alcohol or are overweight.

Treating HCV has been challenging because the virus mutates frequently, developing variations that resist both the immune system and antiviral medications. The current standard treatment is a combination of pegylated interferon (Pegasys® [peginterferon alfa-2a] or PEG-Intron® [peginterferon alfa-2b]) and ribavirin. For many people, treatment isn't effective, and even when it is, there's a high rate of relapse once treatment stops.

Researchers are developing new treatments, some of which are in phase III testing, that they hope will be more effective. Particularly promising is a protease inhibitor in phase II trials called telaprevir (VX-950) that inhibits an enzyme the virus needs to replicate and survive.