

Hepatitis C Virus (HCV), an Overview of the Diagnosis, Treatment and Nursing Implications

Beth Powell

Hepatitis is the condition of inflammation of the liver. By definition, it may be caused by toxic chemicals, drugs, viruses, alcohol, or any other factor that may cause injury to hepatocytes, the cells of the liver. Hepatitis is most commonly caused by a virus. Before the late eighties there were three viruses identified: A, B; and non-A and non-B. Today there are six viruses identified, A, B, C, D, E and G.

The focus of this paper is on the Hepatitis C virus (HCV), a single-stranded RNA virus that belongs to the Flavivirus family. HCV is a blood-borne virus. The HCV enters the body through a break in the skin and targets the liver cells where it replicates, is released from the infected cell and goes on to infect more healthy cells. The initial phase of hepatitis C is called the acute phase. The symptoms of acute HCV may include fatigue, jaundice, appetite loss, abdominal pain, nausea and vomiting, joint pain, dark urine and clay-colored stool. Often these symptoms are flu-like. Sixty to seventy percent of people in the acute stage have no symptoms at all and this is why HCV often goes undiagnosed. In those who do develop symptoms, the average time period between exposure and symptom onset is 4–12 weeks. Fifteen to twenty percent of acute cases spontaneously clear within 2–12 weeks. However, up to 80% of people initially infected with HCV do not clear the virus from their bodies, and continue to have liver disease and with 55% developing into chronic liver disease. Many people with chronic HCV do not have symptoms and lead relatively normal lives for a number of years at which point that changes. A symptom or symptoms of HCV may not bring about a clinical visit for 15 to 20 years. In the 80% who develop chronic HCV, 20% of those progress to cirrhosis over the course of 10–40 years. The rate of progression of liver scarring (fibrosis) shows significant variability among individuals. Recent data suggests that among untreated patients, roughly one-third progress to liver cirrhosis in less than 20 years. Another third progress to cirrhosis within 30 years and the remainder of patients appear to progress so slowly that they are unlikely to develop cirrhosis within their lifetimes (NIH, 2002). Factors that have been reported to accelerate the rate of HCV disease progression include age (individuals between the ages of 45-55 have a faster progression rate), gender (males progress more rapidly than females), alcohol consumption, smoking, and HIV or HBV co-infection. Four to six percent of those with cirrhosis progress to Hepatic cellular carcinoma, or cancer of the liver.

When we talk about risk we are talking about persons who have come into direct contact with the blood of a Hepatitis C infected individual sometime in the course of their lives. The individuals who should be screened for HCV include:

- anyone who was given a blood transfusion, received an organ, or had surgery prior to 1992 before tests for HCV antibodies became readily available on the market (until 1992 blood

transfusions were the most common way to get HCV), anyone receiving blood clotting factors before 1987

- anyone who has ever received long-term hemodialysis treatment
- anyone with known exposures to HCV, such as healthcare workers from needle-sticks and sharps involving HCV-positive blood,
- anyone with the HIV virus
- anyone who has sex with multiple partners
- anyone who has had piercings or tattoos and may have been infected through unsterile instruments, and
- children born to HCV-positive mothers.

Because the nation's blood supply since 1992 has been thoroughly screened for HCV, injection drug users now have the highest rate of infection. The risk of transmitting HCV through sexual activity is very low. The CDC has not found any higher incidence amongst monogamous married couples above the rate of infection amongst the general population. Men who have sex with men, prostitutes, and people with multiple sex partners and people seen at STD clinics may have a slightly higher incidence of sexual transmission. The risk goes up if the HCV-positive or HCV-negative partner has another sexually transmitted disease, especially one that causes genital sores or lesions (Franciscus & Highleyman, 2004, tab 5). Other ways to transmit HCV are through cuts, nosebleeds, menstrual blood, or sharing toothbrushes, razors, and earrings, straws used to snort cocaine, contaminated medical instruments, or any other item that may contain traces of blood.

Since the HCV antibody test came on the market, approximately 500,000 people have been diagnosed with the virus, either because they became symptomatic and approached their physician or because it was discovered by blood tests while they were being treated for other co-morbidities. After testing positive for antibodies a polymerase chain reaction RNA test is used to confirm the disease.

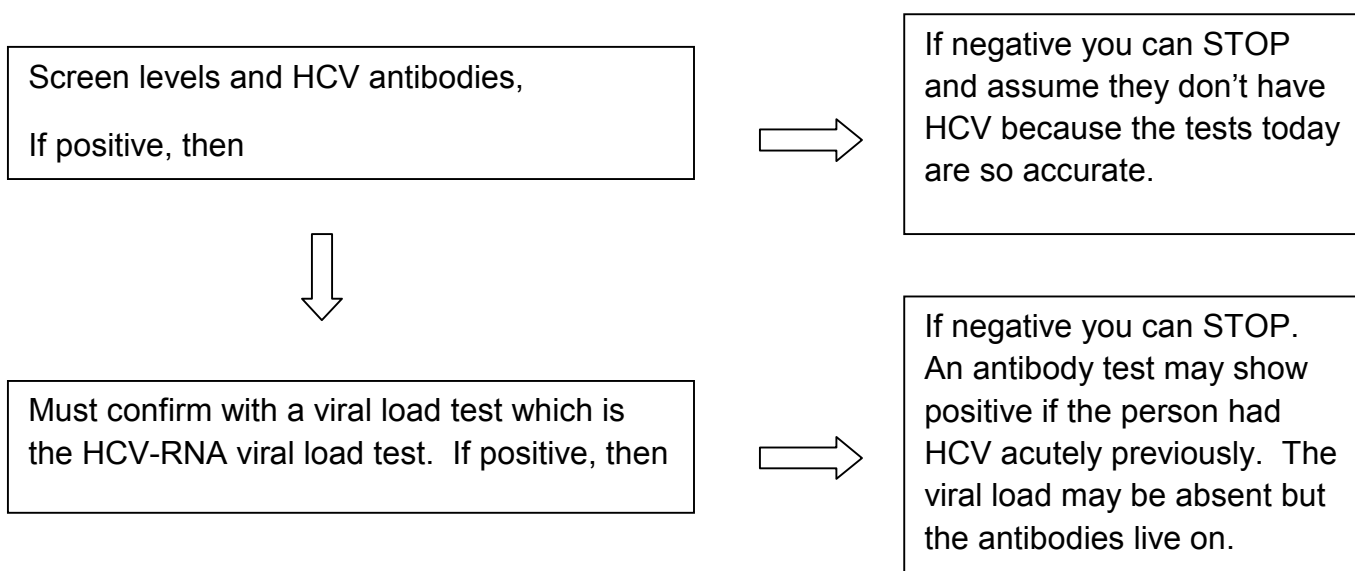
Hepatitis C has been called The Silent Epidemic. Most people know nothing about this common virus, how it is spread or what its consequences are. The most alarming fact about this disease is that 80-90% of persons infected with the virus have no idea they have it so the virus continues to be spread. There is no vaccine for Hepatitis C although there is one for A and B. Many sources state that 4 million Americans are infected with HCV—four times as many as those diagnosed with HIV—but the American Association for the Study of Liver Disease (AASLD) puts the number closer to 5.3 million Americans because the homeless, veterans and the incarcerated were not included in the CDC estimate. Thirty-five thousand more are diagnosed each year. An estimated 15,000 people die of HCV annually and that number is expected to triple in the next decade or so. According to some estimates, HCV deaths in the U.S. surpassed HIV/AIDS deaths three years ago.

In the state of Oregon 47,000 people are chronically infected, (Report, Oregon Public Health Division, Acute and Communicable Diseases, 2007). The majority of these people infected are between the ages of 40 and 60, most of whom were likely infected during the 1970's and 1980's when infection rates were the highest (CDC, FAQ's for Health Professionals, Viral Hepatitis). Between 2006 and 2007 Oregon's highest incidence (30%) of all acute HCV cases were reported in males between the ages of 20 and 29. Females in the same age group comprised 20% of all acute cases. The age groups between 30 and 50 years old comprised 10% of all acute cases reported. Currently 55% of those acutely infected in Oregon and nationwide acquired their HCV through injection drug use as a result of sharing needles and equipment. Those who used a needle exchange program had a lower incidence (22%) of positive tests compared with those who did not use clean needles (80%).

In a Jackson County pilot study conducted between June 2007 and June 2008, free HCV testing was offered to high risk individuals, mainly injection drug users and those who were incarcerated. Jackson County submitted 53 anti-HCV tests to the Oregon State Public Health Laboratory and 8 of those (15%) were positive. These 8 were considered chronic carriers; no acute cases of HCV were discovered through this testing setting. Six of these eight were males and the most common risk factor reported was injected drug use with methamphetamine being the drug of choice, (Jackson County Free HCV Testing Pilot Study, 2008).

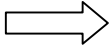
An estimated 60% of people in prison in the United States are infected with HCV; this figure doesn't include county jails because this population is in transition. Approximately 1.4 million HCV-infected persons pass through the corrections system annually, accounting for one-third of the total number of HCV-infected persons in the United States. This high prevalence of HCV infection is due to the substantial increase in drug-related arrests over the past 2 decades. Another major concern regarding transmission today in the 18 to 25 year old population is potential exposure to blood-borne pathogens as a result of unsanitary exposure from piercings and tattoos because of unsafe practices. These activities are occurring in state and federal prisons which add to the higher incidences of the disease in this population.

To screen, diagnose, and decide how to treat HCV, Dr. Lorenzo Rossaro, Chief GI and Hepatologist of University of California at Davis, suggests the following algorithm:





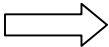
We are certain they have HCV and we are trying to determine the severity and treatment guidelines. Next step is to do a genotype test to determine which of the six HCV genotypes is, and predict response to therapy.



If it turns out to be genotype 2 or 3, testing may be STOPPED and treatment may be discussed. Genotype 2 & 3 respond well to treatment—75% success rate with 6 months of treatment.



If it's genotype 1a or 1b look again at patient's history to determine when exposure may have occurred. Look for physical findings (stigmata of liver disease). Check labs. If these tests don't indicate severity of chronic liver disease, then



Labs: Persons having advanced chronic liver disease may have ↑ PT-INR (liver responsible for many clotting factors), ↓albumin (liver makes proteins), ↓platelets (due to increased size of spleen, secondary to portal HTN), and ↑ alphafetoprotein (due to liver trying to regenerate itself).

Stigmata: Ascites with umbilical hernia, spider angiomas that blanch when pressed, malnutrition, temporal wasting, jaundice or palmar erythema.

Liver biopsy not needed, begin treatment.



Liver biopsy should be considered. With a liver biopsy the severity of fibrosis on a scale of 0–4 can be graded which is useful when determining disease progression and treatment options.

HCV requires effective instruction in order to be competently managed. A person first diagnosed with HCV should maintain open dialog with healthcare providers to be guided through the processes. Not only should the patient receive regular care and monitoring of liver health but the patient's overall wellness may be determined by lifestyle choices that emphasize healthier ways to live. Education should begin by examining the ways the patient may begin to incorporate lifestyle modifications such as with diet and exercise. A healthy, well-balanced diet that follows the food pyramid is generally recommended. Alcohol should be eliminated from the body permanently. Some literature advises that alcohol should be taken in moderation because many of the studies done do not address

occasional drinkers, but many experts agree that abstinence from alcohol is the only policy, (Franciscus & Highleyman). Alcohol lowers the immune response, helps HCV replicate and lowers drug treatment response (Franciscus & Highleyman). Exercise is always very important. Exercise helps boost the immune system, and helps reduce fatigue, tension, stress and depression. Adequate rest is also important to allow the liver to heal. Fatigue can be debilitating at times so most patients know the value of rest. The patient must avoid any substance that is hepatotoxic, including smoking. Certain prescription and over the counter medications are hepatotoxic, as are recreational drugs, herbal remedies and excessive vitamin and mineral supplements. Environmental toxins such as paint thinners, solvents, pesticides, and aerosol sprays should be avoided. Patients with hepatitis C can also be infected with hepatitis A or hepatitis B so it is strongly recommended that they receive a vaccination for Hepatitis A and Hepatitis B if those titers were negative. If they have Hepatitis C and acquire Hepatitis A or B the outcome can be very severe, including death. Again, there is no vaccine for Hepatitis C.

Current FDA-approved HCV treatments include standard interferon-alfa monotherapy, standard interferon plus ribavirin combination therapy, pegylated interferon monotherapy, and pegylated interferon plus ribavirin combination therapy. The human body produces its own interferon which helps defend against invaders. Interferon adds to the body's potential to defend by preventing the entry of viruses into cells, which limits new cellular infection. Interferon stimulates the production of cytokines which call into action macrophages, NK cells, and killer T-cells. Pegylated interferon is an extended release version so fewer injections are required. Interferon is usually injected subcutaneously three times a week.

Because of the potential for adverse reactions, interferon is contraindicated for patients with a major depressive illness, a psychiatric disorder, hyperthyroidism, cytopenias, autoimmune disease, history of kidney transplant, or active substance abuse. It is prohibited in those who are pregnant (American Family Physician, vol.59, no.2). It is also not given to those who have demonstrated non-compliance in the past. Ribavirin is a nucleoside reverse transcriptase inhibitor or NRTI which inhibits viral replication. It is taken by mouth, usually 1000 to 1200 mgs a day. The primary goal of this combination therapy is SVR or sustained virological response, meaning blood serum shows a significant reduction or complete elimination of HCV-RNA for a period of six months after the close of treatment. When this is not possible, the goal of therapy is to decrease the progression of the disease thereby reversing cirrhosis, decreasing the risk of cancer, and eliminating the need for a liver transplant. Together, interferon and ribavirin can eradicate HCV in 75% of people with genotype 2 and 3 HCV. Response rates are much lower for people with genotype 1 HCV (40-50%), (Franciscus & Highleyman).

Some patients may have control of how long they can hold off treatment by practicing a healthy lifestyle that focuses on wellness. HCV treatment is costly and not without side effects and needs to be monitored closely. As mentioned above, beginning treatment is accomplished by open dialog between doctor and patient. It is not a prerequisite that the doctor be a hepatologist or gastroenterologist so long as the doctor is familiar with chronic liver disease protocol and has access to specialists if a question should arise. It is recommended, however, that the first consultation be

done with a specialist in chronic liver disease. The rate and level of chronic liver disease progression should be determined and the patient consulted as to the conditions and duration of the treatment so that a successful adherence to protocol may be followed. There are many factors to consider before the start of treatment. The patient's livelihood should be considered. If they operate heavy machinery, or have to maintain a high level of alertness can they safely do so while on HCV medication? Do they want to start their regimen while on vacation so they can have time to adjust before returning to work? Do they have a home or are they homeless? Do they have access to a phone? Do they have insurance or do they want to apply for a pharmaceutical assistance program? Another very important factor to consider is whether the patient has access to a doctor, NP or case manager at all times. It is important that the patient isn't given their meds, along with instructions and told to come back in six weeks for a follow-up. A two-week follow-up is more appropriate, or a follow-up every week if that's what's needed. One study has shown that the patients who have received better social support—easier access to the health system, home visits by health professionals and family support—had more intense natural killer (NK) cell responses, (*Psychological Bulletin*, 119(3), p.488). The NK cells fight against viruses. The patient also has a better chance at following a medicine regimen knowing that they are not in this alone. Treatment can be emotionally and physically draining. Besides the physical dimension to this disease there is the psychosocial dimension. People with HCV often feel isolated, anxious related to relationships, scared of their own mortality, worried about finances, worried about their decreased quality of life, and worried about the stigma associated with HCV. HCV-related liver disease sufferers experience the same discrimination as HIV carriers.

Side effects of the HCV drug regimen can be quite debilitating for some people. For some the side effects produced by interferon and ribavirin may often be so intense that the patient gives up the treatment or the treatment is discontinued by the physician. Other patients seem to manage without any side effects. A person's reaction to the medicine regimen is highly individual. The most common side effects include depression, anorexia, sleep alterations, myalgias and fatigue. Interferon depletes serotonin in the brain and has been known to cause serious depression. In some cases it causes decreased libido, hair loss, dry skin and rashes, and/or nausea and vomiting. Ribavirin has a hemolytic effect, causing anemia, and makes symptoms from interferon worse. Ribavirin is teratogenic so for women two forms of birth control are needed for up to six months post treatment. Side effects generally subside three months after treatment but may take more time for some patients.

Side effects can be managed with adjunct medications such as pain killers, antidepressants, and drugs that stimulate blood cell production. Some people will need to have their doses of interferon or ribavirin modified if side effects cannot be effectively controlled. In general it is recommended that a person on HCV therapy inject before bedtime, drink lots of water, take low doses of ibuprofen or acetaminophen, take pain or sleep medications, keep up with light exercise, moisturize daily, vary their injection sites, consider antidepressants, get plenty of rest and eat frequent small meals.

Effective treatment can improve liver function tests, reverse liver tissue damage, and/or reduce viral loads. Some people experience all these benefits and some only achieve one, two, or none. Some

people can achieve a lower viral load in the first twelve weeks of therapy only to have it increase again a few weeks or months after treatment. For a percentage of persons the viral load becomes completely undetectable. If the viral load is still undetectable six months after the close of treatment, it is called a sustained virological response.

Last but not least, it is important to address the nurse's role in caring for the HCV patient. It is paramount that nurses must first protect themselves to make sure they do not contract HCV through careless behavior, or that they and their peers never expose another person to the HCV virus. Outbreaks of HCV have occurred in outpatient settings, hemodialysis units, long-term care facilities and hospitals as a result of unsafe injection practices, reuse of needles, fingerstick devices and syringes (CDC, Healthcare Settings and Viral Hepatitis). Just last January it was discovered that 50,000 endoscopy patients in Nevada had been exposed to Hepatitis B, Hepatitis C, and HIV because healthcare workers were reusing syringes and vials. Nurses must exercise extreme vigilance to blood-borne precautions when practicing—every time, without fail—for the safety of themselves, their patients and their peers. Bad habits and substandard practice should be reported immediately to help prevent the spread of infectious diseases. As long as Standard Precautions and other infection control practices are used consistently, medical procedures do not generally pose a risk for the spread of HCV. Still, every year there are over 1,000,000 injuries reported from conventional needles and “sharps” (e.g. scalpels, IV catheters) with as many as 5,000,000 unreported (Market Watch, 2008). The average rate of seroconversion (becoming positive) after an occupational exposure to HCV positive blood is about 1.8%, but has ranged as high as 7–10% in some studies. This risk is highest with hollow-bore needles, (Reau and Jensen, 2003).

A very important part of the nurse's job is to recognize all patients who may be at risk for HCV by taking thorough histories. Again, this group includes:

- Persons who ever injected illegal drugs, including those who injected just once years ago
- Persons who received a blood transfusion or organ transplant before July 1992
- Persons who received clotting factor concentrates before 1987
- Persons who were ever on long-term dialysis
- Children born to HCV-positive women
- Healthcare, emergency medical and public safety workers after needlesticks, sharps, or mucosal exposures to HCV-positive blood
- Persons with evidence of chronic liver disease

The nurse must then encourage testing and begin health promotion and prevention with his or her patient. The role of the nurse as educator cannot be stressed enough. Many patients, partners, friends and family do not understand this disease and may be scared that they may contract HCV also. Nurses need to teach the patient how the disease can be transmitted and how it cannot be

transmitted, to alleviate their concerns. The nurse should suggest that the person's partner get tested for several reasons. The partner of the infected individual is going to want to know if they have HCV also. A negative test will put their fears to rest and the nurse can educate about prevention so partners can protect themselves in the future. If the partner does test positive, once the genotype is identified, it may be different than their partner's, and it can be said that the transmission was acquired from a different event and source. If the strain is the same it cannot be assumed it was acquired through sexual intercourse. It's also good to know if both partners have been infected, for if one person has been through treatment they should know if their partner is infected so they can avoid possible re-infection.

The HCV virus is not transmitted through casual contact. The nurse needs to help his or her patient discuss their fears and concerns and help the patient come up with appropriate ways of coping with these concerns. One concern the patient will undoubtedly have is how to deal with the stigma attached to HCV. Often people assume that the person who acquires HCV is injecting street drugs, or is overly promiscuous, or is a homosexual. They may even believe the person who contracted HCV deserved it and brought it on themselves through their immoral lifestyle. Nurses cannot let this stigma perpetuate itself. The nurse needs to be able to provide the patient with resources such as support groups, online communities and current research. Most importantly, the nurse needs to help the patient strike a balance between living with the disease and living a normal life. She needs to teach the patient methods of how to accentuate the positive (what hasn't been impacted by HCV) and how to deal with the negative aspects of living with HCV chronic liver disease.

Educate, educate, educate is the mantra. The CDC's research funds for Hepatitis have decreased dramatically over the past ten years but getting the accurate word out is free. If nurses can dispel the myths about HCV, then patients themselves can dispel the myths for other persons. As funding dries up, a grassroots effort becomes increasingly important.

Literature Cited

Burrow, D., & Remak, W. (2008). Procedural crisis in Nevada and possibly elsewhere: Back to nursing 101 [Electronic version]. *The Nursing Voice*, 13(2).

Center for Disease Control (2001). A comprehensive strategy for the prevention and control of hepatitis C virus infection and its consequences. Retrieved November 30, 2008, from <http://www.cdc.gov/hepatitis/HCV/Strategy/NatHepCPrevStrategy.htm>

Chronic hepatitis C: Current disease management". In *National Digestive Diseases Information Clearinghouse*. (2006). Washington, D.C: National Institute of Health. Retrieved November 30, 2008, from <http://digestive.niddk.nih.gov/ddiseases/pubs/chronichepc/>

Durston, S. (2004, July). The ABC's...and more...of hepatitis . *Nursing Made Incredibly Easy*, 2 (4). Pages 26-33.

Franciscus, A., & Highleyman, L. (2004). Train the trainer workshop. A *Hepatitis C Training Manual* (3rd ed.). San Francisco: The Hepatitis C Support Project.

Maddrey, W. C., & Schiff, E. R. (2001). A guide to living with chronic hepatitis b and c. In *The Hepatitis Workbook*. Schering Corporation.

Moyer, L. A., Mast, E. E., & Alter, M. J. (1999, January 15). Hepatitis c: part II. prevention counseling and medical evaluation [electronic version], *American Family Physician*, Retrieved November 30, 2008, from <http://www.aafp.org/afp/990115ap/349.html>

Reau, N., & Jensen, D. M. (2003). *Needlestick exposure and hepatitis c*. San Francisco: Hepatitis C Support Project.

Strauss, E., & Teixeira, M. (2006, September 1). *Quality of life in hepatitis c*. Retrieved November 30, 2008, from <Http://www.medscape.com/viewarticle/543535>

Viral hepatitis, FAQ's for health professionals. In *Department of Health and Human Services*. (2008). Washington, D.C: Center for Disease Control. Retrieved November 30, 2008, from <http://www.cdc.gov/hepatitis/HCV/HCVfaq.htm>

Uchino, B. M., Cacioppo, J. T., & Kiecolt-Glaser, J. K. (1996). The relationship between social support and physiological processes: a review with emphasis on underlying mechanisms and implications for health [Electronic version]. *Psychological Bulletin*, 119(3), 488-531.

William Remak, Chairman, California Hepatitis C Task Force (Phone interview Nov. 2008)

© Copyright, 2008. Beth Powell, All Rights Reserved