

§ 122410

COMMUNICABLE DISEASES  
Div. 105

(5) Protocols for public safety and health care workers who come in contact with hepatitis C patients.

(6) Surveillance programs to determine the prevalence of hepatitis C in ethnic and other high-risk populations.

(7) Education and outreach programs for high-risk individuals, including, but not limited to, individuals who received blood transfusions prior to 1992, hemophiliacs, veterans, women who underwent a caesarian section or premature delivery prior to 1990, persons who received an organ transplant prior to 1990, persons who receive invasive cosmetic procedures, including body piercing and tattooing, students, minority communities, and any other categories of persons at high risk for hepatitis C infection as determined by the director. Education and outreach programs shall be targeted to high-risk individuals as determined by the director. Education programs may provide information and referral on hepatitis C including, but not limited to, education materials developed by health-related companies, community-based or national advocacy organizations, counseling, patient support groups, and existing hotlines for consumers.

(c) Nothing in this section shall be construed to require the department to develop or produce any protocol, guideline, or proposal.

(Added by Stats.1998, c. 867 (S.B.694), § 1. Amended by Stats.2000, c. 754 (S.B.1256), § 3.)

Cross References

Department of Corrections, generally, see Penal Code § 5000 et seq.  
Department of Health Services, generally, see Health and Safety Code § 100100 et seq.  
Peace officers, generally, see Penal Code § 830 et seq.

Library References

Health ¶383. C.J.S. Health and Environment §§ 28 to 34,  
Westlaw Topic No. 198H. 36 to 43.

§ 122415. Director of Corrections; duties relating to hepatitis C virus in correctional facilities

(a) The Director of Corrections shall do all of the following:

(1) Provide the budget subcommittees of the Legislature, on or before March 1, 2002, with an annual statistical report on the prevalence of the hepatitis C virus in correctional facilities and trends in the incidence and prevalence of the hepatitis C virus in the correctional system.

(2) Establish and make available a voluntary program to test inmates for the presence of the hepatitis C virus upon incarceration and in conjunction with any routine blood testing.

(3) Update treatment protocols and regimens as new therapies become available.

(b) This section shall be implemented only to the extent funds for this purpose have been appropriated in the annual Budget Act.

(Added by Stats.2000, c. 754 (S.B.1256), § 4.)

HEPATITIS C  
Pt. 7

§ 122420

Library References

Health ¶383. C.J.S. Prisons and Rights of Prisoners §§ 55,  
Prisons ¶17(2). 59, 63 to 66, 68 to 69, 71 to 72, 76 to 90,  
Westlaw Topic Nos. 198H, 310. 125, 129, 138.  
C.J.S. Health and Environment §§ 28 to 34,  
36 to 43.

§ 122420. Director of Health Services; development of public education and outreach program; duties related to hepatitis C virus in high-risk groups

The Director of Health Services shall do all of the following:

(a) Develop and implement a public education and outreach program to raise awareness of the hepatitis C virus aimed at high-risk groups, physician's offices, health care workers, and health care facilities. The program shall do all of the following:

(1) Attempt to coordinate with national public education efforts related to the identification and notification of recipients of blood from hepatitis C virus-positive donors.

(2) Attempt to stimulate interest and coordinate with community-based organizations to sponsor community forums and undertake other appropriate community outreach activities.

(3) Employ public communication strategies utilizing a variety of media that may include, but is not limited to, print, radio, television, and the Internet.

(b) Include information on co-infection of human immunodeficiency virus (HIV) or hemophilia with the hepatitis C virus in the professional training and all appropriate care and treatment programs under the jurisdiction of the department.

(c) Develop a program to work with the Department of Corrections to identify hepatitis C virus-positive inmates likely to be released within two years and provide counseling and treatment options to reduce the community risk.

(d) Urge local public health officials to make hepatitis C virus screening available for uninsured individuals upon request.

(e) Include hepatitis C counseling, education, and testing, as appropriate, into local state-funded programs including those addressing HIV, tuberculosis, sexually transmitted disease, and all other appropriate programs approved by the director.

(Added by Stats.2000, c. 754 (S.B.1256), § 5.)

Cross References

Department of Corrections, generally, see Penal Code § 5000 et seq.  
State funds, see Government Code § 16300 et seq.

Library References

Health ¶383. C.J.S. Health and Environment §§ 28 to 34,  
Westlaw Topic No. 198H. 36 to 43.

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HepHope has been created to provide others with useful and updated information about the Hepatitis C virus, to provide a network of support for those affected.

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## HEPATITIS C: THE BASICS

- Hepatitis C is the most serious form of hepatitis, and **there is currently NO vaccine or cure.**
- Hepatitis C currently affects about 4 million Americans (about 4 times the number of those infected with HIV!) and about 175 million people world-wide (about 2% of the population).
- There are anywhere from 35,000 to 185,000 new cases in the U.S. per year.
- Chronic Hepatitis C results in 10,000-20,000 deaths a year in the U.S. This figure is expected to triple within the next 10-20 years as more people discover they have HCV.
- Hepatitis C is the most common blood-borne infection in the United States.
- About 85% of all infections develop into chronic infections (also see [The Lifecycle of Hepatitis C](#))
- Liver failure due to hepatitis C is now the leading cause of liver transplants in the United States.
- The Hepatitis C Virus is difficult to treat because it has nearly 90 subtypes!

## SYMPTOMS

Many people with hepatitis C have no outward signs or symptoms (I didn't). Others experience "flu-like" symptoms which can often be tricky to catch. These include:

- fatigue
- loss of appetite
- nausea and vomiting
- fever
- weakness
- mild abdominal pain

-----Less common symptoms include:

- dark urine
- jaundice (yellowing of the skin and eyes)

## WAYS HEP C IS SPREAD

## WAYS HEP C IS NOT SPREAD

## Hepatitis C is easily spread by blood.

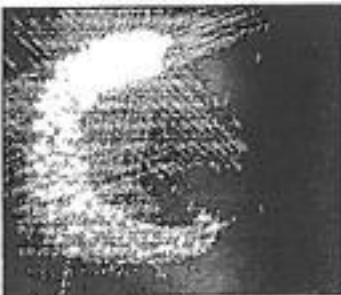
- blood transfusion before 1992, including blood received during a c-section
  - Read more about the risk of contracting HCV through blood transfusions here.
- hemodialysis (using a kidney machine)
- jobs with exposure to blood (especially health care workers), or if you've been exposed to blood in the military
- tattoos and body piercing (potentially contaminated needles or ink)
- sharing straws for inhaling cocaine
- sharing a razor, toothbrush, or any item that could carry infected blood
- sharing needles for IV drug use
- unprotected sex with multiple partners
  - studies are being done by the CDC and NIH to determine a more accurate estimation of prevalence by sexual transmission. These studies are not complete and those that have already been known to have HCV are advised to follow safe sex practices until more findings are known.
  - The risk of contracting hepatitis C through sexual contact is extremely low.
- Approximately 1/3 of patients with hepatitis C never find out how they contracted the virus.

*If you suspect that you have hepatitis C or think you have been in contact with an infected person, consult your physician as soon as possible! The sooner you are aware, the sooner you can begin to do something about it.*



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*Marty probably had hepatitis A. This diagnosis was subsequently confirmed by the results of Marty's blood test.*

*Marty's condition seemed touch and go for a while, but after one month, Marty was discharged from the hospital. By six months, Marty was totally better and his jaundice totally resolved.*

*Patricia, a twenty-year-old college senior, went on a two-week expedition to Africa with some of her classmates. As taking the trip was a last-minute decision, Patricia did not see her doctor prior to leaving the country to find out if she needed any special immunizations. But Patricia wasn't worried—she knew she would be staying in a good hotel and planned to drink only bottled water.*

*The trip went well, but about two weeks after returning home, Patricia came down with flu-like symptoms that included persistent nausea, fatigue, headache, and low-grade fever. She completely lost her appetite. Also, cigarette smoke began to taste odd, leading to her quitting her smoking habit—something she'd been trying to do for several years. After she began to experience itching so severe that it kept her awake at night, Patricia decided to see her family physician.*

*Patricia's doctor asked her some questions, including whether or not she had obtained the necessary immunizations before going to Africa. He examined her and noted that her eyes were slightly yellow and that her liver was somewhat enlarged. He drew some blood from her arm for testing.*

*"I believe that you have hepatitis A," the doctor told her. "Despite the precautions you may have taken as to food and beverages, you probably acquired it on your excursion to Africa."*

*"Hepatitis A?" Patricia exclaimed. "I thought I had the flu!"*

*Patricia's doctor advised her to stay home and rest until she felt healthy enough to go back to school. The blood test results confirmed the doctor's diagnosis of hepatitis A. She stayed at home for the next two days and rested. By the third day, Patricia awoke feeling energetic and felt healthy enough to return to school. By the following week, all of her symptoms had resolved.*

**T**his chapter discusses the hepatitis A virus (HAV). You will learn the routes by which HAV is transmitted to others, as well as which people are at particularly high risks of becoming infected. In addition, the symptoms and physical signs associated with hepatitis A and the manner in which a person is diagnosed are explained in this chapter. The treatment of hepatitis A and the prognosis for those infected are also covered.

## WHAT IS HEPATITIS A?

Hepatitis A is inflammation of the liver due to a virus called the hepatitis A virus (HAV). Prior to its identification in 1973, it was known as *infectious hepatitis*, due to the fact that HAV is so contagious. HAV only causes acute hepatitis. See an explanation of acute hepatitis in Chapter 7. In the United States, HAV is the most common cause of acute viral hepatitis. Each year, approximately 134,000 people in the United States are infected with HAV. In fact, around 33 percent of all people in the United States have, at some point, been infected with HAV, and approximately 74 percent of adults over fifty years old have evidence of exposure to this virus.

HAV is usually thought of as the least serious of all the hepatitis viruses. This is due to the fact that—unlike the hepatitis B and C viruses—HAV does not cause chronic liver disease, and therefore the disease lasts no longer than six months. Cirrhosis and its complications can never result. Moreover, hepatitis A will not result in liver cancer. However, each year, hepatitis A causes a substantial number of people to get very ill. Some of these people require hospitalization. Many others, although not needing hospitalization, still lose a significant amount of time from their jobs.

Though it is typically not fatal, hepatitis A accounts for approximately 100 deaths each year in the United States. Furthermore, it has been shown that when a person with another liver disease, such as chronic hepatitis C, becomes infected with HAV, she may experience a particularly serious and potentially life-threatening form of hepatitis. Fortunately, hepatitis A is the most common vaccine-preventable disease in the entire world. See Chapter 24 for information on prevention and vaccination.

## HOW HAV IS TRANSMITTED

As discussed in Chapter 7, HAV is transmitted by the enteric or fecal-oral route. In short, this means that transmission occurs when HAV embedded in the feces of an infected person enters the digestive tract of the another person. More precisely, the virus enters through the mouth, passes from the stomach into the small intestine, and then gains entry into the liver.

The liver is the major site of HAV replication. After the virus is finished multiplying and infecting the liver, it leaves the liver via the bile ducts and is excreted into the bile. As discussed in Chapter 1, the bile ducts enter into the small intestine. So HAV goes back into the small intestine, which directly connects with the large intestine, and is mixed in with the stool and eliminated from the body through the rectum. HAV is now ready to infect the next unsuspecting victim. HAV transmission is likely to occur through person-to-person contact, from consumption of contaminated food or water, or by other routes, all of which will be discussed on the following pages.

### Person-to-Person Contact

Person-to-person transmission via close personal contact is perhaps the most common means of acquiring HAV. People living in the same household as an infected person are at increased risk of becoming infected themselves. People who live in communities where sanitation standards are poor and people living in crowded conditions are also at increased risk for infection.

A person with hepatitis A is at her most infectious during the two-week time period preceding and the one-week period following the development of any symptoms or signs of infection. Many people, especially young children infected with HAV, have no symptoms at all. Thus, young children are often a major route of transmission of HAV, as they commonly harbor the virus unknowingly. Furthermore, their hygiene habits tend to be less meticulous than those of adults. Children are more likely to spread the virus to others, as they tend to play in close contact with other children and are closely handled and cared for by adults. Therefore, a common source of hepatitis A outbreaks has been day-care centers—primarily day-care centers that provide care to children who wear diapers. Another common source of outbreaks has been institutions for the mentally disabled, since many living in these facilities often have poor personal hygiene and live in crowded conditions. Note, however, that outbreaks have been less frequent since conditions in institutions have improved.

A person is no longer infectious to others approximately a week or two after symptoms and signs of hepatitis A have begun. There is no evidence that sexual transmission plays a role in spreading HAV, other than anal-oral sex. HAV is not transmitted to the fetus during pregnancy or childbirth.

### Contaminated Food and Water

Ingestion of contaminated food and beverages is another important route of HAV transmission. Foods that have been reported to transmit HAV have included milk, strawberries, pastries, hamburger meat, and salads. In these instances, the food was either uncooked or was handled after cooking by an HAV-infected person who did not properly wash her hands after defecating.

Shellfish often live in bodies of water that may be polluted with HAV. Thus, they appear to have a particularly high incidence of transmitting HAV when eaten raw or incompletely cooked—as is often the case with clams, oysters, and mussels. There have been few incidents of transmission of HAV by water—either by drinking contaminated water or by swimming in HAV-infested water. (Don't forget, bottled water containing non-bottled ice cubes is also a risk.)

### Other Routes

While there are a few incidents where blood transfusions are believed to be the source of a hepatitis A infection, the blood supply is considered safe and transfusions are

### Understanding and Treating Hepatitis A

not considered to pose a risk for HAV transmission. While intravenous drug users (IVDUs) are at a somewhat increased risk of acquiring HAV as compared with the general population, it does not appear that intravenous drug use is a very significant mode of HAV transmission. Other factors, such as poor hygiene and unsanitary living conditions, may explain the increased incidence of hepatitis A among IVDUs. In general, it appears that blood-to-blood transmission of HAV occurs infrequently. HAV has occasionally been detected in other body fluids, such as saliva and urine. However, it is believed that these are not routes of HAV transmission.

### THOSE AT AN INCREASED RISK FOR HEPATITIS A

Hepatitis A is the most common vaccine-preventable disease in the entire world. Aside from vaccination, there are other measures that a person can take to minimize her chances of acquiring HAV. In addition, many precautions may be taken by a person infected with HAV so as to reduce the likelihood of transmitting this virus to others. Prevention of hepatitis A will be discussed in Chapter 24. The following people are at increased risk for contracting HAV.

- People who travel to developing countries, including tourists, military personnel, Peace Corps workers, and missionaries.
- Men who have sex with men.
- People who practice oral-anal sex.
- Intravenous drug users.
- People who have contact with sewage (this appears to be an insignificant mode of transmission in the United States).
- Employees and children (particularly those in diapers) at day-care centers.
- Employees and patients in institutions for the mentally disabled (incidence has greatly decreased since sanitary conditions have improved).
- People who work with non-human primates, such as apes and monkeys, which can also transmit HAV.
- People who live in crowded conditions with poor sanitation.

### THE INCUBATION PERIOD OF HEPATITIS A

After entering the body, HAV incubates. The *incubation period*—the time between the entrance of the virus into the body and the initial appearance of symptoms and signs of the disease—of HAV is about one month, but may be as short as two weeks or as long as almost two months. The length of the incubation period is inversely related to the quantity of HAV that enters the body. This means that if a large amount

of HAV enters the body, the incubation period is shorter than if only a small amount is ingested. As noted above, a person is most infectious during the two-week period prior to and the one-week period after exhibiting any symptoms or signs of hepatitis A. This helps explain why hepatitis A is so contagious. People are not aware that they harbor the virus, which prevents them from taking the necessary precautions to insure that they do not pass it on to others.

### THE SYMPTOMS AND SIGNS OF HEPATITIS A

The development of symptoms is directly related to the age of the person. The younger the person, the more likely the infection will be asymptomatic—without symptoms. In fact, approximately 90 percent of HAV-infected children who are younger than five years old are asymptomatic. Thus, children silently pass the virus in their stools, and it is their parents, exposed unknowingly to HAV, who are the ones most likely to suffer with symptoms due to infection.

The degree of symptoms among people with hepatitis A varies greatly. Some people have no symptoms at all and are surprised to learn that they were ever exposed to the virus. Others may have nonspecific symptoms such as fatigue or symptoms that may be confused with a very bad cold or flu—chills, loss of appetite (especially for fatty foods), and a headache. Often symptoms include a sudden fever, abdominal pain, diarrhea, nausea, and vomiting. Many adults become jaundiced and seek the attention of a doctor when they notice their urine is dark or tea-colored and/or their stools are light or clay-colored. These people often have pruritus (intense itching). Usually, a week prior to becoming jaundiced, these people experience some nonspecific symptoms such as malaise and weight loss. Some HAV-infected individuals state that cigarettes taste distasteful to them, and they actually stop smoking during this time. When adults become very ill, studies have shown that approximately one month is typically lost from work. In fact, 11 to 22 percent of people with hepatitis A become so ill that they require hospitalization.

Some people occasionally develop symptoms and signs of hepatitis that are unrelated to the liver. These are known as *extrahepatic*—outside or unrelated to the liver—manifestations of hepatitis A. These manifestations may include arthritis (inflammation of the joints); vasculitis (inflammation of the blood vessels), often associated with a rash; cryoglobulinemia (abnormal proteins in the blood); kidney failure; diabetes (elevated blood sugar levels); and gallbladder disease.

In very rare instances, people with hepatitis A develop a particularly severe form of acute hepatitis known as fulminant hepatitis A, which is discussed in Chapter 7. These people become extremely ill, developing severe jaundice, encephalopathy (mental disorientation or coma), and coagulopathy (bleeding tendency noted by a prolonged prothrombin time). Liver failure develops abruptly—usually within eight weeks from the onset of symptoms, or within two weeks from the onset of jaundice. All people with fulminant hepatitis A require immediate hos-

pitalization into an intensive care unit (ICU) and prompt referral for a liver transplant. Liver transplantation is discussed in detail in Chapter 22.

People with hepatitis A will usually appear to be in good or normal health during a physical exam. Occasionally, the physical exam may reveal an enlarged, tender liver or jaundice. Though not a frequent occurrence, a person may have a rash.

Symptoms and signs usually last a month or two. Once jaundice appears, symptoms often begin to resolve. Jaundice, accompanied by urine and stool discoloration, typically begins to resolve within a few weeks. About 10 to 15 percent of people with hepatitis A may experience a prolonged course or a relapse (relapsing hepatitis A). During the period of relapse, symptoms and signs return after a previous resolution. Blood work again becomes abnormal and the person is again infectious. In any scenario, by six months all symptoms and signs of hepatitis A will resolve.

### DIAGNOSING HEPATITIS A

Neither symptoms, signs, nor LFT abnormalities can definitively confirm that a person has hepatitis A, nor can these manifestations distinguish hepatitis A from other forms of hepatitis.

The only way of definitely diagnosing that a person is infected with HAV is by obtaining specific blood tests known as the *hepatitis A serology*. The standard hepatitis A serology includes both the immunoglobulin M (IgM) antibody to HAV and the immunoglobulin G (IgG) antibody to HAV. The other liver function tests, which were discussed in Chapter 3, are routinely performed when any type of liver disease is suspected.

#### HAV Antibody Immunoglobulin M (IgM) (HAV Ab IgM)

When a person tests positive for the existence of immunoglobulin M (IgM) antibody to HAV (HAV Ab IgM), it indicates that the person is currently infected with HAV or has been infected recently. HAV Ab IgM becomes positive approximately one week after a person has been exposed to HAV, and may remain positive for up to six months thereafter. This antibody then becomes undetectable in the blood; thus HAV Ab IgM will be negative on blood test results after six months.

#### HAV Antibody Immunoglobulin G (IgG) (HAV Ab IgG)

When a person tests positive for the existence of immunoglobulin G (IgG) antibody to HAV (HAV Ab IgG)—in cases where HAV Ab IgM is no longer detected—it indicates that the person was exposed to HAV at some point in the past, but no longer has an active infection. (Note, however, that in the acute phase, HAV Ab IgG will be positive.) These people can never become infected with HAV again and are no longer infectious to others. Though these people are protected against future HAV infections,

they are not protected against other hepatitis infections, such as B and C. The HAV Ab IgG remains positive lifelong and will always be detected in blood tests (HAV Ab IgG positive) when a test for HAV Ab IgG is specifically ordered by a doctor.

### AST and ALT (Transaminases)

People with hepatitis A may have very elevated transaminases (ALT and AST) around 500 IU/L to 2,000 IU/L. The degree of elevation of the transaminases does not correlate with the severity of symptoms, nor is it predictive of the outcome of the disease. In most people, transaminases return to normal in about one month. In virtually everyone with hepatitis A, they return to normal by six months. Thus, if transaminases remain abnormal after six months time, another cause for these elevated liver tests must be searched for. For example, on rare occasions, HAV may trigger the onset of a liver disease known as autoimmune hepatitis, which will be discussed in Chapter 14.

### Bilirubin

An elevated bilirubin level occurs in approximately 70 percent of adults with hepatitis A. In contrast, only 20 percent of children younger than two years old are jaundiced. The bilirubin level usually does not rise greater than 10 mg/dl, and usually returns to normal within eight weeks. In cases where the bilirubin level remains elevated for ten weeks or more, the person is known as having cholestatic hepatitis. In people with cholestatic hepatitis, the bilirubin can reach levels as high as 20 mg/dl, and is often associated with pruritus (itching). In any case, the bilirubin level always returns to normal by six months' time.

### Imaging Studies and Liver Biopsy

Imaging studies are usually normal for people with hepatitis A and will not provide a basis for a diagnosis. It is especially important to perform imaging studies in jaundiced individuals in order to eliminate the possibility that a disorder other than hepatitis A, such as gallstones, is responsible for the abnormal LFTs. A liver biopsy is not needed to establish a diagnosis of hepatitis A. Therefore, liver biopsies are infrequently performed when hepatitis A is suspected.

### TREATMENT OF HEPATITIS A

There are no specific medications used to treat hepatitis A. Treatment decisions are usually based on the symptoms experienced by the patient. Bed rest and decreased physical activity are not necessarily required. Each person should, on her own, determine a comfortable level of activity based on how she feels. If a person feels well, she may go to work. If she feels fatigued, a decreased level of activity or a

midday nap is in order. It is always recommended that a person with hepatitis A consume plenty of fluids so as to avoid dehydration. This is especially important if diarrhea is one of the symptoms. All alcohol should be avoided during this time, as alcohol may provoke a relapse of the disease.

People who have fulminant hepatitis A need to be immediately admitted to the intensive care unit of a hospital for close management. These people have a high incidence of doing poorly. Thus, patients who are not improving should be considered for liver transplantation. Approximately 30 percent of people with fulminant hepatitis A are at risk of death without a transplant. Patients with fulminant hepatitis A who undergo transplantation generally do very well, with approximately an 80-percent chance of surviving. Transplantation will be discussed in Chapter 22.

### THE LONG-TERM PROGNOSIS FOR THOSE WITH HEPATITIS A

People with hepatitis A do not suffer any long-term consequences from the infection and are not chronically infectious to others. Within six months of contracting hepatitis A, symptoms, signs, and LFT abnormalities related to hepatitis A totally resolve. Chronic liver disease does not occur. Therefore, contracting HAV does not put one at risk for cirrhosis and/or liver cancer.

Approximately 0.2 percent of people infected with HAV develop fulminant hepatitis A. Each year approximately 100 people either die or require a liver transplant as a result of fulminant hepatitis due to HAV. Older people and people with underlying liver disease are more likely to develop fulminant hepatitis A and are more likely to have a poor outcome from fulminant hepatitis A.

### CONCLUSION

Increasingly healthier and cleaner living conditions—such as improved sewage disposal and more sanitary water and food supplies—have contributed to a decline in the incidence of hepatitis A in the United States over the past several decades. However, outbreaks continue to occur. While outbreaks are typically without consequences for most people, a small yet significant percentage of people become severely ill, requiring time out of work, hospitalization, and possibly liver transplantation. People especially at risk for a particularly debilitating course of hepatitis A are elderly individuals and those already suffering from some other chronic liver disease, such as chronic hepatitis C. Infection with HAV is 100-percent preventable. This prevention is discussed in Chapter 24. The next chapter will discuss another preventable type of viral hepatitis—hepatitis B. While the acute symptoms and signs of hepatitis B may resemble those of hepatitis A, the major distinguishing point between these two hepatitis viruses is that, unlike hepatitis A, hepatitis B can lead to chronic liver disease, cirrhosis, and liver cancer. Also discussed in the next chapter is hepatitis D, a hepatitis virus that cannot survive without HBV.

### HCV and Other Hepatitis Viruses

It is not infrequent for people with chronic hepatitis C to be additionally infected with another hepatitis virus. It has been noted by some researchers that fulminant hepatitis (see Chapter 7) and even death can occur in people with chronic hepatitis C who become infected with the hepatitis A virus (HAV). Some studies have found that people infected with both HCV and HBV have a very aggressive course of disease and are at increased risk of developing cirrhosis and decompensated liver disease. Therefore, everyone with chronic hepatitis C who has not been exposed to HAV or HBV is urged to obtain the vaccinations against these other hepatitis viruses. Vaccinations will be discussed in Chapter 24.

Coinfection of HCV with the hepatitis G virus (HGV) is not believed to influence the outcome of liver disease due to HCV.

### HCV and Autoimmune Hepatitis

A form of autoimmune hepatitis (AIH) may occur in people with chronic hepatitis C. It has been shown that the coexistence of these two liver disorders does not lead to a poorer outcome of disease in a person with chronic hepatitis C. However, the coexistence of these two liver disorders may cause some treatment dilemmas. This is discussed in more detail in Chapters 13 and 14.

### HCV and Herbs

There has been a boom of interest in the use of herbal remedies for the treatment of chronic hepatitis C. However, many herbs are in and of themselves toxic to the liver. Due to the lack of FDA regulation regarding marketing and labeling, it is quite possible that many people are unknowingly ingesting herbs that are actually toxic to their livers in the mistaken belief that what they are ingesting will improve the health of their livers. Herbal remedies and how they may affect the progression of chronic hepatitis C is an area that warrants further investigation. See Chapter 21 for information on which herbs to avoid and which herbs may be safe.

### HCV and Iron Overload

Excessive iron can be harmful to the liver and can lead to liver damage and cirrhosis. Chapter 18 is devoted to this topic. Many people with chronic hepatitis C (especially men) have increased iron levels in their blood—iron, ferritin, and transferrin saturation. This may be due to iron being released into the bloodstream by dying liver cells. Some of these people may carry a gene for hereditary iron overload. It is possible that iron may promote the replication of HCV. Some studies have noted that people with chronic hepatitis C who have high iron levels respond poorly to treatment with interferon (see Chapter 13). This is why iron reduction therapy in the form of phlebotomy (removal of blood through a vein) has been proposed by some researchers as a possible treatment or adjunctive treatment option for people with chronic hepatitis C who have high iron levels. In any case, it is probably wise for people with chronic hepatitis C, especially those with high iron studies and also

### Understanding Hepatitis C

those with cirrhosis, to avoid iron supplementation or foods fortified with iron. Nutrition for people with chronic hepatitis C will be discussed in Chapter 23.

### HCV and Environmental Factors

Environmental toxins, such as toxic fumes and pollutants from work sites, polluted air, waste, paints, and other sources, may potentially promote acceleration of disease in people with chronic hepatitis C. This association remains largely unexplored. However, since everything that we are exposed to, including what we breathe and absorb through the skin, is filtered through the liver to be detoxified, it makes sense that certain environmental factors may also contribute to a worsening course of liver disease.

### Chronic Hepatitis C and Liver Cancer Risk

Among people in whom cirrhosis develops, approximately 1 percent per year are at risk for liver cancer, also known as hepatocellular carcinoma (HCC) or hepatoma. It has been estimated that approximately 15 percent of people with cirrhosis due to HCV develop liver cancer within approximately ten years of the time cirrhosis occurred. In contrast to hepatitis-B-associated liver cancer, cirrhosis is present in all cases of hepatitis-C-associated liver cancer.

In people with chronic hepatitis C, drinking alcohol excessively appears to increase the risk of developing liver cancer, thereby underscoring the importance of abstinence in people with hepatitis C. As stated above, it appears that coinfection with both HBV and HCV also greatly increases a person's chances of developing liver cancer. As such, it is important for people with chronic hepatitis C who are not already infected with hepatitis B to obtain the hepatitis B vaccination. (See Chapter 24 for more information on vaccinations). It usually takes more than thirty years for liver cancer to develop from the time of initial infection with HCV. Males and people older than fifty-five years appear to develop liver cancer more frequently than females and younger individuals. It has been demonstrated that treatment with the antiviral drug interferon (see Chapters 11, 12, and 13), prior to the development of liver cancer may actually lower the incidence of liver cancer in some people with chronic hepatitis C (see Chapters 13 and 19). This underscores the importance of early detection and aggressive treatment of chronic hepatitis C prior to the development of advanced liver disease.

### CONCLUSION

Perhaps the most frightening aspect of chronic hepatitis C is its clandestine and progressive nature. Most people harbor the virus for ten, twenty, or even thirty years, not knowing it's in their bodies and oblivious to the liver damage it has caused. However, there are some encouraging aspects of this disease—the most common cause of liver disease in the United States. The number of new HCV infections has declined significantly. There is greater awareness and knowledge about HCV trans-



# Memorandum

Date : May 18, 2007

To :   
Men's Advisory Council



Subject : **RESPONSE TO DISEASE TRANSMISSION/PREVENTION**

This memorandum is in response to your letter dated April 17, 2007 regarding the inmate population's concerns about the transmission of diseases. Specifically, the Men's Advisory Council was concerned about the pending installation of flushometers in all of the housing unit toilets and its potential for the spread of diseases, infections, elevated in-cell violence, and the potential for fatalities.

Let me begin by saying that the flushometers are rapidly becoming the standard throughout the correctional industry and the California Department of Corrections and Rehabilitation. The installation of the flushometers at Mule Creek State Prison became necessary when the Regional Water Quality Control Board specified their use in order to reduce the institution's wastewater production.

After numerous water flow surveys and tests by both the Control Board and the institution, it was determined that the only reasonable alternative was to reduce the flow of water coming from the toilets and showers through the use of flushometers (see attached charts). Additionally, I created an institutional water utilization committee to examine what other alternative can be put into place to reduce the water flow in other areas of the institution. Their recommendations have been reviewed and put into place such as "no irrigation days". However, the largest consumer of water in this institution is and will always be the inmate population.

In regards to the inmate population's concern about the spread of infectious diseases as a result of the use of the flushometers, no evidence exist that this will be an issue. Our medical staff report that although fecal matter/waste may be odorous, there is no indication that fecal matter is harmful while sitting on an unflushed toilet (such the case in a portable toilet used during a public event such as a concert). Fecal matter is only harmful if consumed or if it comes in contact with open areas of the skin.

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As far as hepatitis C positive inmates or any other immune compromised inmates, all inmates that are diagnosed with such diseases are given a vaccination against hepatitis A and B if they are not already immune. All diseases discussed in your memo must either be consumed or contact an open portion of the skin. An inmate has a higher potential in getting an infection from an illicit tattoo than from fecal matter in an unflushed toilet.

Finally, the issue regarding the potential for in-cell violence as a result of the use of the flushometers; inmates are subject to the same disciplinary process for such violence up to including criminal prosecution. I do not expect this will be the case, I believe that in the end the impact on the use of the flushometers will be negligible and will be accepted by the inmate population.



Warden (A)  
Mule Creek State Prison

Attachments

cc: