Made possible with the support of the Center for Disease Control

HBV: A Silent Killer

Welcome Aboard the Jade Ribbon Campaign!

Dear Colleague,

Thank you for joining the Jade Ribbon Campaign. All of us at the Asian Liver Center and all those who have been impacted by our efforts applaud you for acknowledging hepatitis B as an extremely serious health problem for the Asian American community. We appreciate your commitment to stay informed so your patients will continue to have the most updated information about hepatitis B and liver cancer.

In recent years, the world's spotlight has focused on diseases such as HIV/AIDS, SARS, and the avian bird flu. While important, these well-publicized diseases have often overshadowed the 350-400 million people in the world that are chronically infected with hepatitis B. Hepatitis B takes a life every 30 seconds. Most of these lives are Asian.

In the United States, a similar phenomenon is seen among the Asian American population. While overall chronic infection rates are relatively low, Asians Americans tend to be infected at a much higher rate, with 1 in 10 Asians chronically infected with hepatitis B. Without treatment or monitoring, 1 in 4 of these individuals will die from liver cancer or liver failure. We need your help to spread the current knowledge to a wider audience of Asian Americans and to let them know that hepatitis B and liver cancer can be prevented.

Founded in 1996, the Asian Liver Center (ALC) is a national leader in hepatitis B awareness and education. Together our three branches—research, clinical treatment, and educational outreach—attack hepatitis B and liver cancer on many fronts. The ALC serves as a resource for both the general public and health professionals to learn about the most current management and treatment options for those living with hepatitis B and liver cancer, as well as innovative approaches to preventing infection.

The Center launched the Jade Ribbon Campaign in 2001 to spread awareness of hepatitis B and liver cancer in the Asian and Pacific Islander community. The campaign seeks to reduce the huge health disparity that exists between hepatitis B prevalence in Asian Americans and the general American population. The campaign has reached thousands of people in partnership with over 450 community organizations and by implementing innovative approaches to education and awareness.

We thank you again for your interest, and we hope that this hepatitis B handbook will aid you in improving and saving lives.

Sincerely,

Dr. Samuel So
Director, Asian Liver Center
The Lui Hac Minh Professor of Surgery
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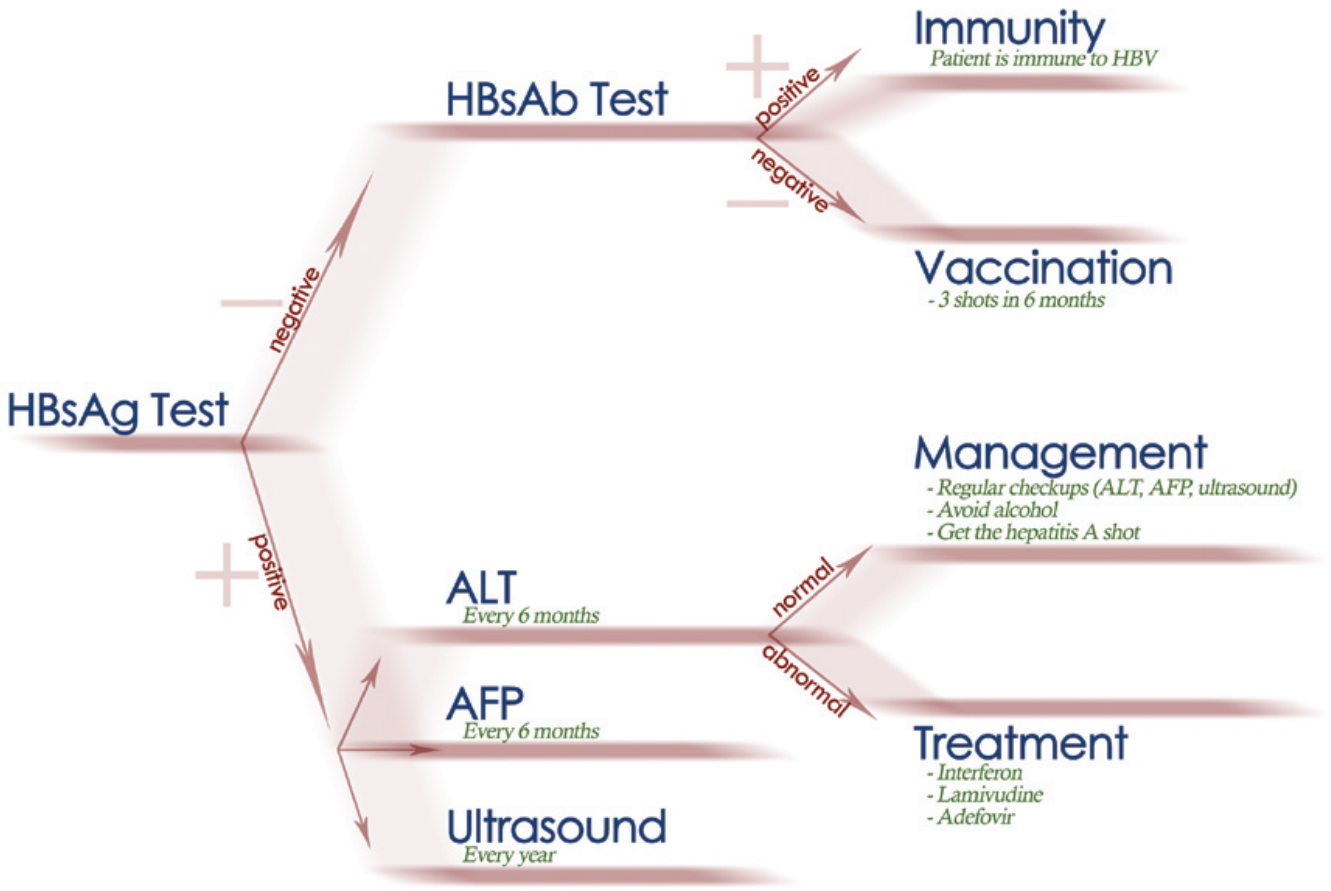

*Note: We recommend that both HBsAg and HBsAb tests be taken at the same time for the patient's convenience.

Jade Ribbon Campaign
to fight Hepatitis B and liver cancer

Hepatitis B: A Global Concern

What is hepatitis B?

Hepatitis B is a disease caused by infection with the hepatitis B virus (HBV). Infection with HBV can lead to cirrhosis of the liver, liver failure, and liver cancer. 80% of liver cancer worldwide is caused by chronic HBV infection.

Global Incidence

Despite the availability of an effective vaccine against hepatitis B for the last 20 years, hepatitis B remains one of the most common infectious diseases worldwide and ranks right behind HIV as the 10th leading cause of death. One-third of the worlds population has, at one time, been infected with hepatitis B. Of these, 350-400 million people have chronic (lifelong) HBV infection (often referred to as HBV carriers).

Mortality

One out of every four chronic carriers will eventually die of liver failure or liver cancer caused by hepatitis B, if left untreated or unmonitored. Worldwide, one million people die each year from cirrhosis or liver cancer. When broken down this statistic is truly staggering. Hepatitis B takes a life every 30 seconds. **Most are Asian.**

Hepatitis B is a Silent Killer

Hepatitis B is silently transmitted and has a silent progression. Many people with chronic HBV exhibit no symptoms and in fact feel perfectly healthy. They may exhibit normal blood tests for liver function. In the past these individuals were referred to as HBV carriers, a term that should be discontinued because it gives the misconception that they are not at risk for the complications of chronic HBV infection. Because so many carriers feel fine, even with early liver cancer, the disease can progress without the carrier even knowing. If symptoms do appear they often are exhibited at the end stages of disease when treatment options are limited or ineffective. **Since the diagnosis is so easily missed by both patients and their physicians, the only way to diagnose for hepatitis B infection is through a simple and inexpensive blood test, the hepatitis B surface antigen test.**

The reason chronic hepatitis B is so dangerous is because without treatment or regular screening for liver cancer, one in four of those who are chronically infected person will eventually die of liver cancer or liver failure. Many die at their prime of lives and as early as 30 years of age, leaving behind family members and children.

HBV and Asian & Pacific Islanders (APIs)

Among the 400 million people with chronic HBV infection, 75% reside in Asia. This trend can also be observed in the United States, where the incidence of hepatitis B and liver cancer constitutes the greatest health disparity that exists between Asians & Pacific Islanders (APIs) and the general U.S. population.

1 in 10 APIs is chronically infected with hepatitis B, compared to 1 in 1000 in the general population. Without treatment or monitoring, 1 in 4 will die from liver cancer or liver failure.

1 out of 8 Vietnamese
1 out of 10 Chinese
1 out of 12 Korean

...are chronically infected with HBV.

1 in 4 will die from liver cancer or liver failure without treatment or monitoring.

HBV in the Chinese Community

China has the greatest burden of hepatitis B and liver cancer in the world. A third of of all chronic carriers (approximately 130 million people) live in China. Each year, an estimated half a million Chinese die of liver cancer or liver failure caused by hepatitis B.

HBV and Liver Cancer

Over 80% of liver cancer is caused by infection with HBV. Liver cancer is the 4th leading cause of deaths by cancer in the world but the 2nd leading cause of death by cancer in China.. In California alone, liver cancer is the 2nd leading cause of cancer deaths among Cambodian and Vietnamese men, the 4th leading cause of cancer deaths among Chinese and Korean men, and the 5th leading cause of deaths among Filipino men.

Because of a lack of resources devoted to increasing preventative health measures regarding HBV and liver cancer and little support for research to find more effective treatments, survival rates for liver cancer have remained consistently and alarming low. In 1996, the survival rate for liver cancer in the United States was only 5%, compared to a survival rate of 4% in 1976. The low survival rate is largely attributed to the fact that many patients do not discover their liver cancer until the very late stages of illness where treatment is ineffective.

A Vaccine Preventable Cancer

HBV infection and the liver cancer and liver failure associated with chronic infection are all vaccine preventable with the hepatitis B vaccine. **It is so effective that the Centers for Disease Control and Prevention have called the hepatitis B vaccine the first "anti-cancer" vaccine**. With awareness and proactive health practices, many lives can be saved, and hepatitis B and liver cancer could be eliminated as a world-wide health problem.

How HBV is Transmitted

Hepatitis B is extremely virulent, and a virus that is up to 100 times more infectious than HIV. Because of its infectiousness and because it can survive outside of the body for up to 7 days, HBV can be spread through items such as shared razors and toothbrushes that have contaminated blood on them.

HBV vs. HIV

Hepatitis B is up to 100 times more infectious than HIV.

HBV outside the body. The virus can live outside the body for 7 days in infected blood.

HBV is transmitted through transfer of infected blood in the following ways:

- From mother to child at birth (Most common for APIs).
- Contact with infected blood (eg. Open wounds or blood transfusion, etc.).
- Unprotected sex (According to the CDC, because the efficacy of latex condoms in reducing HBV is still unknown, the HBV vaccination is still the best form of protection against infection with hepatitis B).
- Sharing needles for drug use, tattoos, or piercings.
- Reusing needles (eg. for acupuncture injection or by health care workers)

Age of infection	% of those infected who become chronic carriers
0-1	90%
1-5	60%
Adults	10%

HBV is NOT transmitted through:

- Contaminated food
- Saliva, tears, sweat, urine, or stool
- Coughing or sneezing
- Sharing food or eating utensils
- Kissing
- Breast-feeding
- Casual contact such as touching and hugging

The Transmission of Hepatitis B in The Asian & Pacific Islander Community

Among Asians & Pacific Islander, transmission of HBV frequently occurs during the birthing process when the virus is passed on from an infected mother, who is often unaware that she is a carrier, to her baby. Transmission of HBV also often occurs during early childhood through close personal contact with blood of infected individuals, such as open wound contact between children during play, or sharing contaminated toothbrushes, etc.

Symptoms of HBV Infection

ACUTE VS. CHRONIC HBV

Hepatitis B a silent killer. It is asymptomatic, so many chronic carriers feel perfectly healthy.

Symptoms of Hepatitis B Infection are Rare

- Most people who are chronically infected with hepatitis B are asymptomatic; only 30% of those with acute infections develop any symptoms. **Most APIs are infected at birth or early childhood, when symptoms may NEVER develop**.
- When symptoms of hepatitis B infection develop, they include jaundice, fatigue, abdominal pain, and loss of appetite. Hepatitis B virus causes both acute hepatitis B and chronic hepatitis B. Most people with chronic hepatitis B have no symptoms until they have developed cirrhosis or advanced liver cancer. At this time, they may experience abdominal distension and pain, GI bleeding, fatigue, edema, or jaundice.
- **Children are more likely than adults to become chronic HBV carriers** after infection. Since APIs are usually infected as infants, they are more likely to develop chronic hepatitis. Over 90% of infants from age 0-1 who become infected with HBV will become chronic carriers.
- **Complications from chronic hepatitis develops in over 25% of carriers** without treatment or monitoring. These include:
    - Cirrhosis
    - Liver cancer
    - Liver failure
    - Death

Three possible responses to infection:

1. **Acute Hepatitis B Resulting in Fulminant Liver Failure**

   Infection with hepatitis B causes extensive liver cell death resulting in liver failure and sometimes death. Fortunately, this most severe form of acute hepatitis is rare.

2. **Acute Hepatitis B with Full Recovery and Development of Immunity**

   Hepatitis B is cleared from the body (this person does NOT become a chronic carrier), and immunity against future infection is developed.

3. **Chronic Infection with Hepatitis B**

   Infection causes HBsAg to develop and persist for life. This infection could lead to elevated rates of liver cancer and cirrhosis. 1 in four of those chronically infected will die of liver cancer or liver failure without monitoring or treatment.

Special Concerns for Infants and APIs

For Infants. For those who are infected as newborns, there is a 90% chance of becoming a chronic carrier. For those infected during childhood, there is a 30%-50% chance. Most Asians are exposed to the disease either during the perinatal period or during childhood.

For APIs. There is a 8-15% prevalence rate of the number of chronic carriers within the Asian community. Perinatal transmission is the most common mode of infection. As a result, prevention of perinatal transmission is of utmost importance in the Asian community. In addition, studies have been shown that Asians are usually not aware of their own infection status which makes screening an essential part of their health. Since HBV is very efficiently transmitted by unprotected sex, all API adults who are sexually active should also be vaccinated to prevent infection.

HBV Vaccination

- The hepatitis B vaccine can provide immunity for life. No booster shots are currently recommended by the Centers for Disease Control and Prevention (CDC).
- Because 80% of liver cancer is HBV-related and can be prevented, the hepatitis B vaccine is considered the first 'anti-cancer vaccine.'
- The hepatitis B vaccine is safe to administer to all populations, including pregnant women, infants, and children.
- For children 0-18 years of age, hepatitis B vaccine is free for children on Medicaid or whose vaccinations are not covered by insurance. These vaccines can be obtained through the federal Vaccines for Children program.
- **Since 10% of APIs have had chronic HBV infection acquired since early childhood, it is prudent and important to check for HBsAg before vaccination.**

The hepatitis B vaccine provides an easy and effective method for preventing HBV infection and its deadly implications including liver cancer and liver failure. The vaccination is so effective and because over 80% of liver cancer is caused by hepatitis B infection, that it is called the first "anti-cancer" vaccine.

Vaccination Schedule

All people, including children, adolescents, and adults, should be immunized using three doses on the following schedule, provided that they are not already chronically infected with HBV. The series can be started at any age.

- **Typical schedule:** 0, 1, 6m.
- Hep A / Hep B Combo vaccine: 0, 1, 6m.
- For those who have fallen behind: **Do not start the series over.** Continue where the patient left off.
- The vaccine can provide immunity for life so no booster shots are currently recommended

Pre- and Post-Vaccination Screening for HBV Immunity

Pre-vaccination Testing. Because 10% of APIs already have HBsAg or anti-HBs pre-vaccination screening is necessary to:

1. **Identify people who do not know they are HBsAg positive**, so they can start managing their illness. The vaccination will not provide any protection to an individual who is already infected with HBV.
2. **Reduce unnecessary vaccinations of people who have already have anti-HBs** through natural infection or prior vaccination. These people are already immune.

Post-vaccination Testing. After completing the series, most children, adolescents, and adults do not need to be tested for hepatitis B antibodies. However, the following groups should be post-tested:

- **Infants of HBsAg+ mothers**. After completion of the series at 6 months, infants should be tested at 9-15 months for HBsAg and anti-HBs.
- **Health care workers**. Test 1-2 months after completion of the series.
- **People with HIV**. Test 1-2 months after completion of the series.

If a Patient Is Not Immune After Vaccination. Although rare, up to 5% of those who complete the vaccination series may not acquire immunity. If immunity is not induced after completing the series, the following steps should be taken:

1. Administer another 3-shot series at the normal intervals using a different HBV vaccine.
2. Test the patient again after completion of this series to make sure he / she is now immune.

Hepatitis B Vaccines

All vaccines are safe and efficacious. Protective anti-HBs levels of >10 mIU/mL develop in 95% to 99% of immunocompetent adults. Antibody levels are reduced in persons over age 40 and in immunocompromised patients, including those with chronic renal failure, human immunodeficiency virus infection and chronic liver disease.

1. Recombivax, Monovalent HBV (Merck)

2. Energix-B, Monovalent HBV (GlaxoSmithKline)

- Recombivax HB and Engerix-B vaccines can be used interchangeably and administered concurrently with hepatitis B immune globulin (HBIG) or other vaccines.

- Since 2000, new HBV vaccines contain no thimerosal (a mercury-containing preservative) or only trace amounts.

3. Twinrix, Combination HAV/HBV (GlaxoSmithKline)

- **Recommended for:** Adults (at least 18 years of age) at high risk of contracting either hepatitis A and hepatitis B, such as travelers to areas of high endemicity for both viruses, military personnel, men who have sex with men, injecting drug users, laboratory workers handling HAV and HBV, or persons at increased risk due to their sexual practices, and adults at risk of more severe disease with HAV or HBV infection, such as patients with chronic liver disease, are all potential candidates for combined vaccination.

Patients	Schedule	Engerix-B	Recombivax HB	Twinrix
Infants with HBsAg-negative mother	0, 1-2, and 6 mo	10 µg/0.5 mL	2.5 µg/0.5 mL	--
Infants with HBsAg-positive mother	At birth*, 1-2 and 6 mo	10 µg/0.5 mL	5.0 µg/0.5mL	--
Children and adolescents (0-19 yr)	0, 1, and 6 mo	10 µg/0.5 mL	5.0 µg/0.5 mL	--
Alternative 2-dose regimen for adolescents (11-15 yr)	0 and 4-6 mo	--	10 µg/1.0 mL	--
Adults (≥20 yr)	0, 1, and 6 mo	20 µg/1.0 mL	10 µg/1.0 mL	1.0 mL**
Immunocompromised adults (hemodialysis)	0, 1 and 6 mo	40 µg/2.0 mL	40 µg/1.0mL	1.0 mL**

* Within 12 hours of birth and with hepatitis B immune globulin (HBIg)
** 1.0 mL of Twinrix contains 720 ELISA Units of Hib and 20 µg of recombinant HBsAg.

Modified from: Centers for Disease Control and Prevention. Update: recommendations to prevent hepatitis B virus transmission – United States. MMWR 1999;48:33-35.

HBV Vaccination: Preventing Infection

All APIs should be screened for HBsAg and HBsAb and those who are not chronic carriers and are not protected should be vaccinated.

A Call to Increase Immunization

Despite the safety and effectiveness of the hepatitis B vaccine, many people do not complete the entire hepatitis B vaccination series. Thus, many people that get infected with hepatitis B could have prevented the illness with a few vaccinations.

Focus on APIs. In 1998, a survey of API children (4-14 years old) in six major U.S. cities, completion rates for the first dose were only 25-80%, and completion rates for the three-dose series were only 14-67%. Cities with no vaccination programs targeting API children had the worst completion rates. Only one in ten API children now aged 15-19 have received their 3-dose hepatitis B vaccine series, in spite of national recommendations targeting these children dating as far back as 1982.

Why haven't more people been vaccinated with hepatitis B?

People do not get vaccinated for hepatitis B because:

- They are unaware of the method of transmission, risk of disease, and that HBV causes liver cancer.
- They are unaware that HBV is the 10th leading cause of death in the world.
- A poor completion rate of the vaccine series because of lack of awareness regarding the benefits and protection provided by the HBV vaccine.
- Public or private sector programs are ineffective in targeting unvaccinated (API) populations.
- The vaccine is costly for adults and often not covered by health plans.

What is being done to increased hepatitis B vaccinations?

Organizations like the Asian Liver Center promote vaccination of all members of the Asian American community by holding screenings and educational programs at schools, churches, and community events.

What can physicians do to increase hepatitis B vaccinations?

Every time a patient comes in, check to see that he/she has been vaccinated for hepatitis B. If not, do a screening and start the vaccination series. In addition, you can help raise awareness about hepatitis B by having educational brochures in the waiting area and around the office for people to pick up.

Important Steps for Pregnant Mothers and Their Newborns

1. Expecting mothers should be tested for HBsAg because perinatal transmission at birth can occur. However, the virus cannot be transmitted via breastfeeding.

2. All newborns should be vaccinated and receive the first dose of the hepatitis B vaccine series within 12-24 hours of birth. Hepatitis B vaccine can be obtained free through the federal Vaccines for Children program for children covered under Medicaid or whose insurance does not cover vaccinations.

3. **Infants born to healthy, HBsAg-negative mothers**. Infants should be vaccinated before leaving the hospital. Subsequent doses are as follows:

1st dose:	Within 24 hours of birth
2nd dose:	Age 1-2 months
3rd dose:	Age 6 months

4. **Infants born to HBsAg-positive mothers**. Infants should get the Hepatitis B Immune globulin (HBIg) in addition to receiving the first shot of the hepatitis B vaccine series within 12 hours of birth. The following doses of the series should be administered at one month and 6 months after birth. Doses are as follows:

1st dose / HBIg:	Within 12 hours of birth (shots can be administered at the same time)
2nd dose:	Age 1-2 months
3rd dose:	Age 6 months
Testing for HBsAg / HBsAb	Age 9-15 months

5. **Infants born to mothers whose HBsAg status is unknown**. Mothers should be tested for HBsAg. If positive, the infant should receive HBIG as soon as possible, before age 1 week.

1st dose:	Within 12 hours of birth
If mother is HBsAg+, HBIg dose:	Within first week after birth
2nd dose:	Age 1-2 months
3rd dose:	Age 6 months
If mother is HBsAg+, Testing for HBsAg / HBsAb:	Age 9-15 months

Summary of Steps for Expecting Mothers

	Action taken for the baby (shots or tests given to the baby)				
Mother's Status	**HBIg**	**1st Dose**	**2nd Dose**	**3rd Dose**	**Testing for HBsAg/ HBsAb**
HBsAg(-)	--	Within 24 hours of birth	Age 1-2 months	Age 6 months	--
HBsAg(+)	Within 12 hours of birth (can be given simultaneously with 1st dose)	Within 24 hours of birth (can be given simultaneously with HBIg)	Age 1-2 months	Age 6 months	Age 9-15 months
Unknown	If mom is HBsAg(+), give within first week after birth	Within 12 hours of birth	Age 1-2 months	Age 6 months	If mom is HBsAg(+), Age 9-15 months.

The Importance of Screening

Because over 10% of the Asian & Pacific Islander community is chronically infected with hepatitis B, all members of the API community should be screened.

Step 1: Identify Chronic Carriers

Hepatitis B surface antigen (HBsAg) Blood Test

The single most important test to identify whether the individual is a hepatitis B carrier is a blood test for the hepatitis B surface antigen (HBsAg).

Test Results	Consequences for the Patient
Positive (+)	**Hepatitis B carrier.** The individual has chronic hepatitis B infection.
Negative (-)	**Not a hepatitis B carrier**. The individual does not have chronic hepatitis B. Vaccination is needed to prevent future infection if the individual has no evidence of immunity or current infection.

If the patient tests **positive for HBsAg**, refer to the section on "The Management of Chronic HBV."
If the patient is negative for HBsAg, continue reading this section to learn about how to find out if your patient is protected against HBV infetion

...If HBsAg is Negative

Step 2: Check For Immunity Against HBV

Hepatitis B surface antibody (HBsAb or anti-HBs) Blood Test

The single most important test to check whether the individual is protected from hepatitis B either through prior vaccination or hepatitis B infection is a blood test for hepatitis B surface antibody (HBsAb).

Test Results	Consequences for the Patient
Positive (+)	**Protected from hepatitis B infection.** The individual has developed immunity against HBV. Vaccination and booster shots are NOT needed.
Negative (-)	**Not protected from hepatitis B infection.** If the individual is not HBsAg(+) and therefore is not a hepatitis B carrier, then hepatitis B vaccination is needed to protect the individual from being infected in the future.

Another Test That May Be Of Interest

Hepatitis B core total antibody (HBcAb or Anti-HBc) Blood Test

Some patients may wish to take the blood test to check for the presence of hepatitis B core total antibody. This test's **main purpose is only to indicate prior infection from hepatitis B**. The presence of hepatitis B core total antibody (HBcAb or anti-HBc) **does not indicate any protection from future infection.**

Test Results	Consequences for the Patient
Positive (+)	Indicates past or current infection with hepatitis B. Does not mean the individual is protected from chronic hepatitis B.
Negative (-)	Indicates that this patient has never been infected with HBV

Because a positive HBcAb test can only tell you that the infection either occurred in the past or is on-going**, the hepatitis B surface antigen (HBsAg) test is still the ONLY way to distinguish chronic HBV carriers.**

Helping Patients Understand

Their Hepatitis B Status

The Physicians' Role: It is important to screen people at risk for hepatitis B regardless of what they think their own disease status is. Unclear results, letters, or miscommunication between physician and patient may cause confusion among patients regarding their hepatitis B status. If the patient falls into one of the risk groups listed above they should be tested for hepatitis B surface antigen or hepatitis B surface antibody as necessary. Studies (Chao, et al.) show misunderstanding of one's hepatitis B status in the API community. In a sample of Chinese Americans from the Bay Area, among participants that reported prior chronic hepatitis B diagnosis, only 43.9% actually had a positive HBsAg, signifying a miscommunication between doctor and patient. Of those who self-reported prior vaccination, only 50% had positive HBsAb tests, which indicates further miscommunication or misunderstanding of one's hepatitis B status.

Your Role as a Physician

Order the HBsAg & HBsAb tests to see whether the person has chronic HBV or has already developed immunity and protection from HBV.

The tests and their possible interpretations are:

HBsAg (+)
HBsAb (-) **chronic carrier**

HBsAg (-)
HBsAb (+) **immune to HBV**

HBsAg (-)
HBsAb (-) **needs vaccination**

To identify **chronic carriers** of hepatitis B use HBsAg, the blood test for the hepatitis B surface antigen.

To check for **protection** from hepatitis B use HBsAb (anti-HBs), the blood test for hepatitis B surface antibody.

To test for **prior infection** with hepatitis B use the hepatitis B core total antibody (HBcAb or anti-HBc) test. However, this test does not indicate whether or not the patient is protected from HBV infection.

The Management of Chronic HBV

MONITORING AND TREATMENT

Hepatitis B is called a silent killer becuase most chronic carriers feel perfectly healthy, even though they may have underlying cirrhosis or be in the early stages of liver cancer.

Because of this, it is important for physicians who see HBV positive patients to remain especially vigilant about closely monitoring for liver damage and cirrhosis caused by the virus as well as maintain a regular schedule for screening for liver cancer.

Steps for Chronic Carriers

1. Measure ALT every 6 months to assess whether treatment is appropriate.
2. Have the AFP test done every 6 months to screen for liver cancer.
3. Receive an ultrasound every year to screen for liver cancer.
4. Get the hepatitis A vaccine to avoid further damage to the liver.
5. Avoid alcohol, drugs, herbal supplements, and other substances that could potentially damage the liver.
6. Have family members screened for HBV and get vaccinated if appropriate.

Step 1 in the Management of Chronic HBV:
Measure ALT to Asseses For Liver Damage

The ALT (also referred to as SGPT) is one of the most useful and cost-effective tests to assess whether treatment is indicated. An abnormal ALT level (1.5-2 times the normal level) is indicative of ongoing hepatocyte injury. **If ALT is normal, there is no data to support the initiation of chronic HBV treatment.**

The HBeAg blood test is also a useful tool that can be used to indicate viral activity. A positive HBeAg generally indicates high viral load, and therefore infectivity. An exception to this is in individuals who have mutant strains of the hepatitis B virus and do not secrete HBeAg. Although HBeAg is not a direct measure of viral load like the more costly HBV DNA-PCR test, HBeAg is a much cheaper test and is still a widely used marker to measure the response to treatment.

While the HBeAg can be helpful, **the ALT is still the best and most effective way to measure for liver damage, and therefore assess whether treatment may be appropriate.**

ALT

What it measures	Assesses whether or not treatment may be appropriate
Frequency	The ALT should be tested every 6 months
Bottom Line	An elevated ALT of 1.5-2 times the normal level is a good indicator of active liver damage. Treatment may be appropriate in this case.
Next Step	Individuals with elevated ALT should get blood drawn for HBeAg, HBV DNA by PCR, and anti-HBe, prior to referral to a specialist.

HBeAg

What it measures	A cheaper test than HBV-DNA for viral load, and hence infectivity. It is a marker used to measure the response to treatment.
Frequency	Not generally a marker indicated for routine screening in chronic carriers.
Bottom Line	This test is more often used in patients who are to be considered for treatment and to evaluate response to treatment.
Next Step	Individuals with elevated ALT should get blood drawn for HBeAg, HBV DNA by PCR, and anti-HBe, prior to referral to a specialist.

Step 1 (continued):

ALT and HBeAg

Possible Results and Interpretations

Normal ALT and HBeAg-Negative or Positive

There is no data to support the treatment of this group of HBV carriers. Nevertheless they are still at risk for the development of liver cancer. These individuals are therefore recommended to follow the guidelines for liver cancer screening.

Elevated ALT (2x) and HBeAg Positive

In general, it is reasonable to consider initiation or referral of patients for treatment if they show signs of active damage to the liver, such as those with a 1.5-2 fold increase in ALT. Currently, lamivudine and adefovir (antiviral drugs that inhibits HBV viral replication), and interferon alfa-2b (an immuno-modulator that stimulates the immune system to kill hepatocytes infected with HBV) are the three FDA-approved treatments for chronic hepatitis B.

The Rationale for Treatment

While there is no cure for hepatitis B, treatment can be used to reduce the liver damage that may result in cirrhosis and liver failure. Although eventual loss of HBsAg has been reported with either treatment in some Caucasian patients (who most commonly acquired the infection in adulthood), similar results have not been reported in API patients (who tend to have a longer duration of infection).

Patients should be informed about the treatment rationale, as well as options, side effects, or risks associated with each treatment. Before initiating treatment, other blood markers that are useful in monitoring the response to treatment are the quantitative HBV-DNA by PCR, and hepatitis Be antibody (anti-HBe) status.

Favorable responses to treatment include normalization of ALT, loss or marked reduction of HBV DNA, or anti-HBe seroconversion (loss of HBeAg and development of anti-HBe). There is seldom an indication for liver biopsy unless it is performed as part of a clinical trial. For patients with mild elevation in ALT (below a 1.5-2 fold increase), regular ALT measurements every 6 months are recommended.

There are currently 3 FDA approved treatments for chronic HBV:

1. **lamivudine** an antiviral drug that inhibits viral replication

2. **adefovir** an oral antiviral drug that inhibits viral replication

3. **interferon** stimulates the immune system to kill hepatocytes infected with HBV

Elevated ALT and HBeAg-Negative

In these cases, the elevation of ALT may be caused by infection with a mutant strain of the virus. Quantitative measurement and the finding of a high HBV-DNA level by PCR in spite of HBeAg-negativity are consistent with this scenario. Other causes of an elevated ALT level should also be considered, including chronic hepatitis C and steatohepatitis (fatty liver).

Screening for Liver Cancer

Step 2:
Screen for Liver Cancer by Measuring AFP Every 6 Months

&

Step 3:
Screen for Liver Cancer Through Ultrasound Every Year

Liver cancer screening generally consists of a blood test for alpha-fetoprotein (AFP) level every 6 months and an ultrasound of the liver once a year. Either test alone can miss the diagnosis.

Alpha-fetoprotein is elevated in nearly 60% of liver cancer, so the AFP test alone may miss the diagnosis. Ultrasound alone may miss 20% of liver cancer, especially in patients who are obese or have a heterogeneous liver due to cirrhosis. If the ultrasound result is inconclusive and the patient has high or rising AFP levels, the patient should be evaluated with a biphasic spiral CT scan of the liver or referred for further assessment. Once the patient develops cirrhosis, the recommendation is to increase the frequency of screening of AFP levels to every 3-4 months, and ultrasound or a biphasic spiral CT scan of the liver to every 6 months.

AFP

What it measures	Screens for liver cancer
Frequency	AFP should be measured every 6 months.
Bottom Line	AFP is elevated is only 60% of liver cancer, so this test alone may miss the diagnosis.
Next Step	An ultrasound should be obtained each year as well.

Ultrasound

What it measures	Screens for liver cancer
Frequency	Should be completed every year
Bottom Line	Ultrasound only catches 80% of liver cancer, so alone this test may miss the diagnosis. If the ultrasound is unsatisfactory, a biphasic spiral CT scan that offers a more detailed study is indicated.
Next Step	Continue to test both AFP (every six months) and ultrasound (each year) regularly

Over 80% of liver cancer is caused by infection with HBV. Chronic HBV infection since childhood is correlated with a higher risk of developing liver cancer, regardless of whether or not the carrier has cirrhosis.

Liver cancer usually develops between 35 and 65 years of age when people are maximally productive and have family responsibilities.

There is a general consensus recognizing the importance of regular liver cancer screening in API HBV carriers, even though the role in Caucasian HBV carriers who become infected later in life is controversial. Although API carriers may develop liver cancer in their early teens, data from the US shows that the incidence of liver cancer begins to rise around the age of 30 years. A reasonable approach is to begin regular liver cancer screening for API HBV carriers starting at 30-35 years of age.

It is especially important to remain vigilant about screening for liver cancer, since the majority of patients have the appearance of perfect health, without showing any early signs or symptoms. Small tumor lumps are impossible to feel because of the shielded location of the liver underneath the ribs. Pain is uncommon until the tumor is quite large, and some tumors don't even cause pain or symptoms. Furthermore, some liver cancers grow extremely rapidly.

Late diagnosis explains why the average survival rate after diagnosis is often quoted as 3-6 months, and contributes to the 5% survival rate of those diagnosed with liver cancer. Early diagnosis by screening for liver cancer in high-risk API hepatitis B carriers and in patients with cirrhosis due to hepatitis B or C is the only effective way of improving the outcome of treatment.

Other Important Recommendations for HBV Carriers

Step 4:
Get the Hepatitis A Vaccine

The hepatitis A vaccination is recommended for patients with chronic HBV infection without immunity to hepatitis A. This is necessary to prevent any further damage to the liver that may be caused by infection with hepatitis A.

Step 5:
Avoid Alcohol

Alcohol is toxic to the liver and patients who are HBV carriers should avoid regular or excessive consumption of alcohol since it may accelerate the progression to cirrhosis and liver failure. Substances, herbal preparations or drugs with known liver toxicity should be avoided.

Step 6:
Have family members screened for HBV and get vaccinated if appropriate

HBV carriers should obtain information about protecting their family members from becoming infected. Family members should be tested for the hepatitis B surface antigen (HBsAg) and hepatitis B surface antibody (Anti-HBs). This will determine if members are protected from future infection, should get vaccinated, or require follow-up for chronic infection.

Eliminating HBV Myths

MYTH: **Patients infected with HBV who show no symptoms and have normal liver function tests are "healthy" carriers.**
FACT: Even patients with chronic hepatitis B often do not have symptoms. Many asymptomatic people are found to have abnormal liver function and underlying liver disease following a HBV screening that reveals their HBsAg (+) status. More than 80% of HCC patients are found to have an underlying and silent cirrhosis. Patients with chronic HBV infection may develop cirrhosis and/or HCC with or without symptoms or abnormal liver function tests. 1 in 4 chronic cases of HBV die of cirrhosis or liver cancer without treatment or monitoring, therefore it is critical to remain vigilant about regularly screening your patients for liver damage (through the measurement of ALT every 6 months) and liver cancer (through AFP measurement every 6 months and ultrasound every year).

MYTH: **A HBV carrier is less likely to have serious complications than people with chronic HBV.**
FACT: The term "HBV carrier" is completely misleading and should be discontinued. An HBV carrier is someone who has chronic HBV.

MYTH: **Hepatitis B is transmitted through eating contaminated food.**
FACT: Hepatitis A (a different type of the hepatitis virus) is the virus that spreads through fecal-oral routes (eg. Through contaminated food). Hepatitis B, on the other hand is transmitted mainly through blood-borne routes and NOT through contaminated food or sharing food or dishes with an infected person.

MYTH: **There is no way of preventing liver cancer (hepatocellular carcinoma, HCC).**
FACT: The hepatitis B vaccine can help to prevent HCC by eliminating the possibility of contracting HBV. Since over 80% of liver cancer is caused by hepatitis B, preventing infection with HBV can eliminate most cases of liver cancer.

MYTH: **Once a person contracts Hepatitis B, liver cancer is inevitable.**
FACT: With regular ALT/AFP tests every 6 months and an ultrasound every 12 months, signs of HCC can be detected early and quickly treated to prevent further spread of the disease. This could increase the probability of survival.

MYTH: **Liver cancer is caused by alcohol.**
FACT: Liver cancer is not caused by alcohol consumption. 80% of liver cancer is caused by chronic infection with hepatitis B. Preventing HBV infection is the best way to prevent liver cancer.

MYTH: **Children born to a mother who is a HBV carrier will always become a chronic HBV carrier.**
FACT: Expecting mothers can protect their babies from becoming HBV carriers if the baby is given the HBIg shot and the first dose of the HBV vaccine within 12 hours of birth. Following this procedure ensures protection for 98% of babies born to HBV positive mothers.

MYTH: **A booster shot of the HBV vaccine is recommended after the 3-dose vaccination series is completed.**
FACT: There is NO recommendation for a booster shot of the HBV vaccination. Successful completion of the series provides complete and lifelong protection against HBV in 95% of people vaccinated.

Glossary of Key Terms

ALT (alanine aminotransferase) — Also referred to as SGPT (serum glutamate pyruvate transaminase), elevated ALT levels can indicate active liver damage.

Alpha-fetoprotein (AFP) — Elevated AFP levels can indicate liver cancer.

Anti-HBe (Hepatitis B e antibody) — An antibody, the presence of which can indicate a good response to the treament of chronic hepatitis B.

Anti-HBe seroconversion — The conversion of HBeAg to anti-HBe.

Chronic carrier for hepatitis B — The clinical definition for an individual for whom the presence of hepatitis B surface antigen persists in the blood for more than six months.

HBV DNA — The most valuable and direct blood test used to measure the hepatitis B viral load.

Hepatitis — A general term meaning "inflammation of the liver," which can be caused by a range of viruses, including hepatitis A, B, C, D, or E.

Hepatitis A — A disease of the liver caused by infection with the hepatitis A virus (HAV). This is the form of hepatitis that is transmitted through food or water contaminated by human fecal matter.

Hepatitis B — A disease of the liver caused by infection with the hepatitis B virus (HBV). Chronic infection with hepatitis B can lead to death caused by cirrhosis (scarring) of the liver, liver failure, or liver cancer.

HBcAb or Anti-HBc (Hepatitis B core antibody) — An antibody, the presence of which can indicate past or current infection with hepatitis B. This is not a protective antibody.

HBeAg (Hepatitis B e antigen) — An antigen, the presence of which can determine whether treatment of chronic hepatitis B may be necessary. A positive result may indicate high viral load, and hence, infectivity. Some mutant HBV virus strains may have high viral load but negative HbeAg.

HBsAb (Hepatitis B surface antibody)	An antibody, the presence of which indicate whether or not an individual has immunity against hepatitis B.
HBsAg (Hepatitis B surface antigen)	An antigen, the presence of which can indicate whether or not an individual is a chronic carrier of hepatitis B.
Hepatitis B Vaccination	A 3 shot vaccination series; successful completion of the series (with the shots administered at months 0, 1, and 6) provides 95% of individuals complete and lifelong protection against hepatitis B.
Hepatocellular Carcinoma (HCC or hepatoma)	The most common type of malignant primary liver tumor, arising from the hepatocytes, the major cell type of the liver.
Adefovir	An oral antiviral drug taken once a day that inhibits HBV viral replication.
Interferon	An immuno-modulator that stimulates the immune system to kill hepatocytes infected with HBV. Given by injection monthly for 6 months. Side effects may include fatigue, hair loss, loss of appetite and depression.
Lamivudine	An oral antiviral drug taken once a day that inhibits HBV viral replication.

A Quick Guide to Blood Tests

Tests to Determine Hepatitis B Status

Hepatitis B surface antigen (HBsAg)

The results from this simple blood test can be interpreted to determine whether the individual is or is not a chronic hepatitis B carrier.

- **A positive result** indicates that the individual tested is a hepatitis B carrier and has chronic hepatitis B infection.
- **A negative result** indicates that the individual is NOT a hepatitis B carrier and does not have chronic hepatitis B. Vaccination against hepatitis B may prevent future infection if the individual has no evidence of immunity based upon the hepatitis B surface antibody (HBsAb) test.

Hepatitis B surface antibody (HBsAb or anti-HBs)

This test can be used to determine whether or not the individual has immunity against infection from the hepatitis B virus (HBV).

- **A positive result** indicates that the individual is protected from hepatitis B infection and does not require vaccination.
- **A negative result** indicates that the individual is NOT protected from hepatitis B infection. If the individual is not a hepatitis B carrier based upon the results of the hepatitis B surface antigen (HBsAg) test, then the hepatitis B vaccination will prevent future hepatitis B infection.

Hepatitis B core total antibody (HBcAb or anti-HBc)

The hepatitis B core total antibody measures both IgG (indicates past infection) and IgM (indicates current infection)

- **A positive result** implies current or past infection with the hepatitis B virus. A positive result does NOT mean that the person is protected from HBV.

Hepatitis B core IgM antibody

The hepatitis B complete panel often includes the hepatitis B core IgM antibody test. The presence of IgM indicates current infection with hepatitis B.

- **A positive result** implies current infection with hepatitis B virus.

The following tests are ordered in hepatitis B carriers to assess 1) whether the individual may benefit from hepatitis B treatment; 2) the response to treatment; 3) whether there is evidence suggestive of cirrhosis; and 4) for liver cancer screening.

1. Tests to Assess Whether an Individual Can Benefit from HBV Treatment

ALT

The ALT is a blood test that can indicate active liver damage. The ALT blood test is one of the most cost-effective tests to determine whether treatment is indicated.

- **If ALT is normal** (ALT<35*), there is no data to support the initiation of chronic hepatitis B treatment, regardless of viral load.
- If ALT is greater than 1.5-2 times the normal level, treatment of chronic hepatitis B may be indicated.
- **If ALT is between the normal or 1.5 times the normal level** (mild elevation), measurements of ALT at regular 6 month intervals is recommended.
- Other possible causes of liver damage and elevated ALT include other types of hepatitis (eg. hepatitis C, autoimmune hepatitis) fatty liver, drugs, and heavy alcohol consumption.

HBeAg

A cost-effective test to indicate viral load.

- **A positive HBeAg**, in most cases, is a good indicator of high viral load and infectivity. An exception is in individuals who have mutant strains of hepatitis B virus and do not secrete HBeAg. Although it is not a direct measure of viral load, like the more costly HBV DNA test, HBeAg is a much cheaper test and is still a widely used marker to monitor the response to treatment.
- **A negative HBeAg** and negative HBV DNA reflects low viral infectivity that does not warrant anti-viral treatment.

2. Tests to Monitor Treatment Response

Before starting treatment of chronic hepatitis B, two additional blood tests that are useful to monitor the response to treatment are HBV DNA and hepatitis Be antibody (anti-HBe). Favorable responses to treatment include normalization of ALT, loss of HBV DNA and HBeAg, and anti-HBe seroconversion.

HBV-DNA

This test directly measures the hepatitis B viral load (usually expressed in terms of copies per milliliter of blood). A significant drop or loss of HBV DNA levels is a good measure of treatment response.

Anti-HBe

This test is useful to monitor the response to chronic hepatitis B treatment. A conversion of anti-HBe from negative (before treatment) to positive (during or post-treatment) is usually a marker for a good response to treatment. This anti-HBe seroconversion can take months or years.

3. Tests to Monitor for Cirrhosis

Platelet Count

A low platelet count (generally less than 150,000) combined with a low albumin level (3.5 gm/dL or lower), with or without an elevated prothrombin time in individuals chronically infected with hepatitis B may suggest cirrhosis with impaired liver function.

4. Blood Tests to Screen for Liver Cancer

Individuals who become infected in early childhood have a higher risk of developing primary liver cancer. Liver cancer can occur in hepatitis B carriers without cirrhosis, and with the presence of normal liver function tests, but the AFP (alpha-fetoprotein) blood test is still a useful tool to screen and diagnose liver cancer.

AFP

AFP levels are elevated above the normal range (generally under 10*) in about 60-70% of primary liver cancer. If the level is greater than 500, and a mass is detected on ultrasound or CT scan, the diagnosis of liver cancer can be made without the need for a biopsy. Occasionally, AFP can be elevated in hepatitis, but the value will drop on repeat testing, as AFP may fluctuate from normal to abnormal. A rising AFP level is almost always associated with liver cancer. Because AFP may be normal in 30-40% of liver cancers, ultrasound or biphasic spiral CT scan is needed to help detected tumors.

* Numbers used as reference points by the Stanford University Laboratories and Clinic. Please consult with your own lab for the reference point used by your facilities.

Where to go for adult Hepatitis Vaccination in San Francisco? 在三藩市, 應到那裡打肝炎預防針?

The best place to be vaccinated is at your doctor's office because you can get the shots in the context of all of your health needs. Many health plans will pay for hepatitis A and B vaccines for adults at high-risk. If you do not have insurance, if your insurance does not cover vaccination, or if you do not want to go to your regular physician for your hepatitis vaccination, the following organizations provide vaccination against hepatitis A and B, often at reduced price or a sliding scale. Please check directly with the clinic for up-to-date information.

最爲理想應到你本人的醫務所, 因爲除了可以打肝炎預防針之外, 你可以處理其它醫療所需. 許多健康保險計劃都會包成人A(甲)和B(乙)型肝炎預 防 針給感染性較高的人群. 如果你沒保險或你的保險不包預防針, 或如果你不想到你本人的醫務所打肝炎預防針, 你可到以下較爲便宜的服務地點. 欲知詳情, 請值接向服務處素取最新知料和價格 .

- A total of 2 shots are needed for hepatitis A vaccine, 3 shots for hepatitis B vaccine, and 3 shots for the combined hepatitis A & B vaccine.
  A 型肝炎預防針需要一共打兩針. B 型肝炎預防針需要一共打三針. 混合A和B 型 肝炎預防針需要一共打三針.
- We strongly recommend that you check with the clinics listed below in advance to verify vaccine cost and availability.
  我們建議你先聯絡以下的服務處查詢它們可否現有預防針.

Provider 服務處	**Location** 地址	**Clinic Schedule** 營業 時間 (am = 早上) (pm =下午)	**Cost per Injection** 每針價錢	**Eligibility** 規定條件	**Phone** 電話 (415)	**Website** 網業 (www)
Adult Immunization Clinic - SF Dept. of Public Health 三藩市公共衛生局-成人疫苗診所	101 Grove Street, Room 102 (號房)	M-F (星期 一至 五) 9am-4pm	HepA(型) $42 HepB (型) $50 Combo (混合型) $85	No requirements 沒規定條件 No appt.required 不用預約	554-2625	sfdph.org/aic
Adult Medical Center at SF General Hospital 三藩市總醫院成人醫療所	1001 Potrero Ave. 1M3 (main lobby) (總禮堂)	M-F (星 期 一至 五) 8:30 am -12pm, 1-5pm	Sliding scale fees (依照收入收費) accept (收) Medicare, MediCal	SF residency 三藩市居民 By appointment 必須預約	206-8492	sfdph.org/chn
Castro Mission Health Center Castro Mission 衛生局	3850 17th Street at (陝) Noe	M-F (星 期 一至 五) 8am -12pm, 1-5pm	Sliding scale fees (依照收入收費) accept (收) Medicare, MediCal	SF residency 三藩市居民 By appointment 必須預約	487-7500	sfdph.org/chn
Chinatown Public Health Center 華埠公共衛生局	1490 Mason Street	M-F (星期 一至 五) 8am-5pm Drop-In Clinic (不用預約門診時間): M (一) 8-11am, 1-4pm Closed Th and third W 關星期四和第三個星期三	Sliding scale fees (依照收入收費) accept (收) Medicare, MediCal	SF residency 三藩市居民 Current clients 限於本診所顧客 Drop-Ins limited to 1st 20 patients 只限於沒預約的頭二十名顧客	705-8500	sfdph.org/chn
SF City Clinic 三藩市診所	356 7th Street	MWF (一, 三,五) 8am-4pm T (二) 1 -6pm TH (四) 1-4pm	Service Fee (收費): $10 donation (捐助) No one is denied if unable to pay (不會被拒絕如沒錢)	SF residency 三藩市居民 Current clients 限於本診所顧客 MD's discretion 醫生推薦	487-5514	sfdph.org/sfcityclinic

Provider 服務處	**Location** 地址	**Clinic Schedule** 營業 時間 (am = 早上) (pm =下午)	**Cost per Injection** 每針價錢	**Eligibility** 規定條件	**Phone** 電話 (415)	**Website** 網業 (www)
Family Health Center at SF General Hospital 三藩市總醫院家庭健康診所	995 Potrero Ave. Building 80 (號樓)	M-F (星 期 一至 五) 8am-12 pm, 1-5 pm	Sliding scale fees (依照收入收費) accept (收) Medicare, MediCal	SF residency 三藩市居民 Current clients 限於本診所顧客 By appointment 必須預約 MD's discretion 醫生推薦	206-5252	sfdph.org
Glide Health Clinic Glide 醫療診所	330 Ellis Street, Room 418 (號房)	M, T, TH (一, 二, 四) 1-5pm W (三) 9am-1pm	Free (免費); donations accepted (接受捐助)	Uninsured 沒保險人士 High risk patients 感染性較高的人士	674-6140	glide.org/chn
Haight Ashbury Free Medical Clinic Haight-Ashbury 免費診所	558 Clayton Street	T (二) 9am-7pm TH (四) 1-5pm	Free for high-risk populations (感染性較高的人士免費)	Uninsured 沒保險人士 High risk patients 感染性較高的人士	487-5632	hafmc.org
International Medical Center 國際醫療所	49 Drumm Street at (陝) Sacramento	M-F (一至 五) 1-4 pm Sat. (六) 10am-12 pm	Hep A(型) $100 Hep B (型) $100	No requirements 沒規定條件 No appt.required 不用預約	398-5300	N/A
Lyon-Martin Women's Health Services Lyon-Martin 女士醫療服務所	1748 Market Street, Suite 201 (號房)	M, T, TH, F (一, 二, 四, 五) 8:30am-5pm W (三) 11am-7pm	Hep A(型) $70 Hep B (型) $22.50 accept (收) Medicare, MediCal	Current clients 限於本診所顧客 High risk patients 感染性較高的人士 By appointment 必須預約	565-7667	lyon-martin.org
Maxine Hall Health Center Maxine Hall 衛生局	1301 Pierce Street	W (三) 1:30-3pm F (五) 8-10am, 1-3pm	Sliding scale fees (依照收入收費) accept (收) Medicare, MediCal	SF residency 三藩市居民	292-1300	sfdph.org/chn
Mission Neighborhood Resource Center Mission 鄰居資源中心	165 Capp Street at (陝) 16th Street	M-F (一至 五) 7am-12pm, 2-7pm Sat. (六) 1-8pm	Hep A(型) Free (免費) Hep B(型) Free (免費) accept (收) Medicare, MediCal	Proof of income 收入證明	869-7977	mnhc.org
Mission Neighborhood Health Center Mission 鄰居衛生局	240 Shotwell Street	M-F (一至 五) 8am-5pm	Initial Admin fee (登記費) $10 Hep A(型) $65 Hep B (型) $50 accept (收) Medicare, MediCal	SF residency 三藩市居民 By appointment 必須預約	552-3870	mnhc.org

Provider 服務處	**Location** 地址	**Clinic Schedule** 營業 時間 **(am = 早上)** **(pm =下午)**	**Cost per Injection** 每針價錢	**Eligibility** 規定條件	**Phone** 電話 **(415)**	**Website** 網業 **(www)**
Native American Health Center 印第安人醫療所	160 Capp Street at (陝) 16th Street	M-F (一至 五) 9am-1pm, 2-5pm	Hep A(型) Free (免費) Hep B(型) Free (免費)	By appointment 必須預約 Low income 低收入 Uninsured 沒保險 High risk clients 感染性較高的人士	621-8051	nativehealth.org
North East Medical Services 東北衛生局	1520 Stockton Street at (陝) Columbus	M-F (一至 五) 8:30am-12pm, 1-5pm Sat. (六) 9am-12pm, 1-4pm	Sliding scale fees (依照收入收費) accept (收) Medicare, MediCal	California resident 加 洲居民 Low income 低收入 By appointment 必須預約	391-9686	nems.org
Ocean Park Health Center 海洋公園衛生局	1351 24th Ave. at (陝) Judah	M, T, F (一, 二, 五) 1-4pm	Sliding scale fees (依照收入收費) accept (收) Medicare, MediCal	Current clients 限於本診所顧客 SF residency 三藩市居民	753-8100	sfdph.org/chn
Overseas Medical Clinic 海外診所	49 Drumm Street at (陝) Sacramento	M-F (一至 五) 1-4pm Sat. (六) 10am-12pm	Hep A(型) $100 Hep B (型) $100	No requirements 沒規定條件	982-8380	N/A
Potrero Hill Health Center Potrero Hill 衛生局	1050 Wisconsin Street	By appointment 必須預約	Sliding scale fees (依照收入收費) accept (收) Medicare, MediCal	Current clients 限於本診所顧客 SF residency 三藩市居民	648-3022	sfdph.org/chn
St. Anthony Free Medical Clinic St. Anthony 免費診所	105-107 Golden Gate Ave.	M-F (一至 五) 8am-12pm, 1-4pm Closed W (三) 1-4pm , 不營業	Hep A(型) Free (免費) Hep B(型) Free (免費)	Uninsured 沒保險 SF residency 三藩市居民 under age 55 55歲以下 First time patients must be in line at 7:30am& 12:30pm for screening 初顧客必須在早上七點半或下午十二點半排隊作查檢	241-8320	sfccc.org/clinics/safmc.htm
San Francisco Free Clinic 三藩市免費診所	4900 California Street	M, T, W (一, 二, 三) 1:30-4:30pm TH (四) 10am-4:30pm F (五) 10am-1pm	Hep A(型) $60 Hep B(型) $35	Uninsured 沒保險	750-9894	sffc.org

Provider 服務處	Location 地址	Clinic Schedule 營業 時間 (am = 早上) (pm =下午)	Cost per Injection 每針價錢	Eligibility 規定條件	Phone 電話 (415)	Website 網業 (www)
Silver Avenue Family Health Center Silver Avenue 家庭衛生局	1525 Silver Ave.	M (一) 8:30-11:30am W (三) 2:30-4:30pm	Sliding scale fees (依照收入收費) accept (收) Medicare, MediCal	SF residency 三藩市居民	715-0310	sfdph.org/chn
South of Market Health Center South of Market 衛生局	551 Minna Street	M, T (一, 二) 8-12 W (三) 8am-8pm TH (四) 8am-5pm F (五) 8am-1pm Sat. (六) 8am-3:30pm	Sliding scale fees (依照收入收費)	SF residency 三藩市居民 Uninsured 沒保險	626-2951	sfdph.org/chn
Southeast Health Center Southeast 衛生局	2401 Keith Street	M, T, TH, F (一, 二, 四, 五) 8am-12pm W (三) 8am-8pm	Sliding scale fees (依照收入收費) accept (收) Medicare, MediCal	SF residency 三藩市居民	671-7000	sfdph.org/chn
Student Health Center at City College of San Francisco 市立大學醫療所	50 Phelan Ave.	M (一) 8am-6pm T (二) 9am-6pm W, F (三, 五) 8am-4pm	HepA(型) $30 HepB (型) $35 Combo (混合型) $55	CCSF students & 19 years of age 此校學生和十九歲以上	239-3110	ccsf.edu
Student Health Center at San Francisco State University 洲立大學醫療所	1600 Holloway at (陝) 19th Ave.	M, TH (一, 四) 8:30am-11:30 am	HepA(型) $38 HepB(型) $42	SFSU students 此校學生	338-1251	sfsu.edu/~shs
Tom Waddell Health Center Tom Waddell 衛生局	50 Lech Walesa street at (陝) Polk	M-F (一至 五) 8am-7:30pm Sat. (六) 9am-4pm	Sliding scale fees (依照收入收費) accept (收) Medicare, MediCal	SF residency 三藩市居民 Urgent care 急診	334-3400	sfdph.org/chn
Veteran's Administration Medical Center 退伍軍人醫療所	4150 Clement Street at (陝) 42nd Ave.		Sliding scale fees (依照收入收費)	Veteran & eligible for Vet services 合付退伍軍人服務 By appointment 必須預約 Positive for HepC 患有C型肝炎	221-4810 x3759	N/A
Women's Community Clinic 女士團體醫療診所	2166 Hayes Street Room 104 (號房)	M,W,TH (一, 三, 四) 5-9pm T (二) 9am-1pm F (五) 11am-2pm	Only(只)HepA(型): Free (免費)	Uninsured women 沒保險的女士 By appointment 必須預約	379-7800	thewomensclinic.org

* The information provided was adapted from the San Francisco Department of Public Health, Communicable Disease Prevention Unit at **www.StopHep.com**. For further questions regarding hepatitis, please contact the Hepatitis Information Line at 415-554-2844 or via email: hepinfo.dph@sfdph.org. Alternatively, please contact NICOS Chinese Health Coalition at 415-788-6426.

* 這些知料是由三藩市公共 衛生局所提供的. 如欲知詳情或更多關於肝炎的知料, 網業是**www.StopHep.com** 或至電 415-554-2844或至電郵: hepinfo.dph@sfdph.org.
另外的聯絡處爲華人健康組織聯會, 請至 電: 415-788-6426.

Notes

ASIAN LIVER CENTER
AT STANFORD UNIVERSITY

300 PASTEUR DRIVE, H3680
STANFORD, CA 94305
GENERAL 650.72.LIVER
TOLL FREE 1.888.311.3331
FAX 650.723.0006
HTTP://LIVER.STANFORD.EDU