HEPATITIS B ALGORITHM

WHO TO TEST?

People born in New Zealand and of Māori, Pacific or Asian ethnicity, unless they are known to have been fully vaccinated as an infant.
Anyone born in an area of high hepatitis B endemicity, including Asia, the Pacific Islands, Africa, the Middle East, southern Europe or the northern or eastern parts of NZ's North Island
People living with someone who has hepatitis B or whose mother or close family member has hepatitis B
A person who has ever had unprotected sex with someone with hepatitis B
Someone who has received a tattoo using unsterile equipment.

DIAGNOSTIC SEROLOGY TESTS

HBsAg (Hepatitis B surface antigen), Anti-HBs (Hepatitis B surface antibody) and anti-HBc (Total hepatitis B core antibody).

If HBsAg is negative and anti-HBs is positive, the patient is immune. No further action is required.

HBsAg-negative: Patient may be immune. Consider anti-HBs testing to confirm.

HBsAg-negative, combined with **anti-HBs-negative and anti-HBc-negative:** Not immune. Consider vaccination.

HBsAg-positive

Refer to the Hepatitis Foundation.

The Hepatitis Foundation will organise:

- *Additional blood tests and investigations: LFTs, INR, full blood count, testing for AFP, and ultrasound if required;*
- *Urgent referral to secondary care for patients with cirrhosis, raised AFP (excluding pregnancy), co-infection with HIV or HCV and those at high-risk of hepatocellular carcinoma (family history);*
- *Long-term monitoring including six-monthly blood tests, information, education and support. Home visits if required.*

TREATMENT FOR HEPATITIS B

Not everyone with hepatitis B needs treatment

Treatment does not usually cure hepatitis B. Anti-viral medications reduce the inflammation and damage occurring in the liver by suppressing viral multiplication and lowering the viral load (HBV DNA). In New Zealand there are drugs used to treat chronic hepatitis B:

Pegylated interferon (Pegasys) boosts the body's immune system and changes the virus' ability to multiply. It is a synthetic version of a protein our bodies naturally produce (interferon). In select individuals a 48-week course of pegylated interferon can be undertaken. The goal of therapy is to put the virus into an inactive state. The virus may be cured in a very small proportion of people treated.

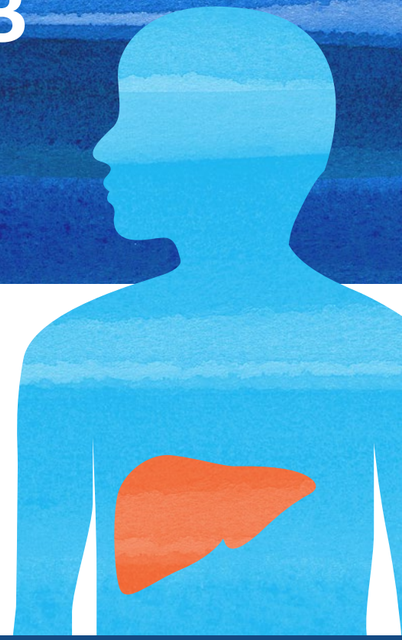
Anti-viral therapy – Entecavir is an oral antiviral drug used in adults who have active virus and liver damage. Entecavir is funded as a first-line therapy for patients with chronic hepatitis B. Almost all patients achieve viral suppression (undetectable HBV DNA) and biochemical response (ALT below the upper limit of normal). Entecavir resistance is rare at less than one per cent after six years.

Tenofovir is an antiviral drug. It is an oral tablet taken once a day. Tenofovir has replaced Adefovir in New Zealand as the first-line therapy for Lamivudine-resistant hepatitis B infection. This is the preferred treatment during pregnancy and breastfeeding. No resistance to Tenofovir has been observed after five years of therapy.

The hepatitis B virus cannot usually be cured and, in most cases, anti-viral therapy needs to be lifelong. In select cases therapy may be discontinued but only under close supervision by a specialist.

Management of chronic hepatitis B

A guide for health professionals



Know it.
Test it.
Treat it.

The Hepatitis Foundation of New Zealand

www.hepatitisfoundation.org.nz | 0800 33 20 10

WHAT THE HEPATITIS FOUNDATION OFFERS

- The Ministry of Health contracts us to provide the national hepatitis B monitoring programme. This includes free, lifelong follow-up for all New Zealanders with chronic hepatitis B infection;
- In partnership with you, we will become responsible for managing your patient's hepatitis B (including referral to secondary care as required);
- We will ensure your patients are tested at regular intervals and abnormal results are reviewed by clinical staff;
- You will be kept informed about your patient's care through our state-of-the-art system enabling effective management of hepatitis B, in partnership with primary care and the Foundation.

THE HEPATITIS FOUNDATION OF NEW ZEALAND AND THE HEPATITIS B MONITORING PROGRAMME

The national hepatitis B monitoring programme is one of the largest of its kind in the world. The Hepatitis Foundation runs this Ministry of Health-funded initiative to help people living with chronic hepatitis B maintain a healthy life.

Healthcare providers are urged to refer patients confirmed as HBsAg positive to the Foundation for enrolment in the Hepatitis B Monitoring Programme. Individuals enrolled will be offered six-monthly blood tests, education, up-to-date information, and access to secondary care if required. You will be kept informed of all test results and your patient's management. In addition, primary and secondary care providers are urged to keep the Foundation informed of results of diagnostic tests or therapeutic interventions they arrange.

Refer your patients to The Hepatitis Foundation of New Zealand. In partnership with you, we will become responsible for managing your patient's hepatitis B.

The Hepatitis Foundation of New Zealand

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PO Box 647, Whakatāne, New Zealand

TESTING FOR CHRONIC HEPATITIS B

The following blood tests are required to identify immune status:

- **HBsAg:** Indicates viral infection;
- **HBeAg:** Indicates a high level of infectivity;
- **Anti-HBs:** When HBsAg-negative, levels of Anti-HBs >10 IU/mL indicate protective immunity;
- **Anti-HBc:** Indicates current or past infection.

Initially, a positive HBsAg test simply reveals the presence of hepatitis B in the blood. In order to consider an individual to have chronic hepatitis B, a further confirmatory test six months later is required. HBsAg, anti-HBs and anti-HBc testing should be offered to household and sexual contacts of people with hepatitis B and vaccination should be offered to those who are susceptible to the virus. This is free of charge on the immunisation schedule to people under 18, sexual partners, household contacts, and other groups. Refer to immunisation handbook.

MARKERS OF HEPATITIS B VIRUS INFECTION

TEST	DESCRIPTION
Hepatitis B surface antigen (HBsAg)	Shows whether a person has a current hepatitis B virus infection. In chronic HBV infection, HBsAg is always detected.
Hepatitis B surface antibody (Anti-HBs or HBsAb)	Shows whether a person is developing immunity to HBV. If HBsAb is positive and HBsAG is negative they are immune and protected against future infection. Their immunity could be from prior infection or vaccination. HBsAb can be positive while a person still has the virus (HBsAg positive).
Hepatitis B e antigen (HBeAg)	Usually detected in the absence of anti-HBe. Shows that the hepatitis virus is multiplying at a very high rate and is therefore very infectious. The HBeAG- positive phase is the earliest phase of HBV infection and is the most common one in children and young adults.
Hepatitis B e antibody (Anti-HBe or HBeAb)	Usually detected in the absence of HBeAg. This later phase of HBV infection follows the development of the patient's immune response against HBeAg and is the most common phase of HBV infection found in middle-aged and elderly patients. This phase is usually associated with lower levels of the virus and reduced viral replication. However, HBeAg-negative patients are still infectious. They may still have active liver disease and can progress to cirrhosis.
Hepatitis B core antibody (Anti-HBc or HBcAb)	Shows whether a person has ever been exposed to the hepatitis B virus. It is detected in patients with current infection and in those who have had previous infection that has cleared. It is not detected in anyone who has immunity through vaccination.
	Always detected during acute infection (and may be the only marker of acute infection in the 'window phase' when HBsAg has disappeared and anti-HBs levels are not yet high enough to be detected.
	Quantitative measure of the HBV (viral load). High HBV DNA levels are one of the criteria for commencing antiviral therapy (along with high ALT or cirrhosis.

MANAGEMENT OF PEOPLE THROUGH THE HEPATITIS B MONITORING PROGRAMME

Regular monitoring of hepatitis B is vital in reducing morbidity and mortality from primary liver cancer (hepatocellular carcinoma (HCC)). Research shows six-monthly follow-up of chronic hepatitis B patients is the gold standard of care to help reduce the risk of liver disease (including HCC)1[1].

Blood tests include ALT/AST: if elevated are markers of active liver inflammation and potential need for anti-viral therapy.

Under the national hepatitis B monitoring programme people with hepatitis B are offered regular blood tests to determine if they are still infected with the virus. Routine blood tests performed six-monthly are:

- HBsAg;
- HBeAg;
- LFTs: liver function tests, in particular ALT and AST
- ALT: screen for active liver inflammation (and need for antiviral therapy);
- AFP: screen for hepatocellular carcinoma (HCC). Please note: this will also be elevated during pregnancy;

The Hepatitis Foundation's community nurses actively support and provide education to individuals and families in the community.

MONITORING FOR COMPLICATIONS OF CHRONIC HEPATITIS B

(I) Active hepatitis needing anti-viral therapy

Six-monthly measurement of serum ALT in all HBsAg positive individuals.

For those with mild inflammation of the liver (ALT <2x upper limit of normal (ULN)), continued six-monthly monitoring is indicated. For those with significant inflammation of the liver (ALT >2xULN). A clinician will review these results, make a personalised plan for that individual and refer to secondary care as needed.

(II) Hepatocellular carcinoma (HCC)

Six-monthly measurement of serum alpha fetoprotein (AFP) in all HBsAg positive individuals.

If the AFP is elevated >20IU/mlng/ml) the results are reviewed by our clinician and, depending on the scenario, it may be repeated at a short interval, an ultrasound may be requested or they may be referred immediately to secondary care. Please note: in all women of child-bearing potential, need to exclude pregnancy as cause for elevated AFP.

The Hepatitis Foundation of New Zealand will keep you informed of patient's regular blood test results.

1 Fung. J. et al. 'Improved survival with screening for hepatocellular carcinoma in chronic hepatitis B'. New Zealand Medical Journal 2004; 117:1206