

## Patient information from the BMJ Group

# Hepatitis B

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## Hepatitis B

Hepatitis B is a liver infection. It can be so mild that you don't notice you have it. Or it can lead to serious illness. There is a vaccine that can protect you against hepatitis B.

We've brought together the best research about hepatitis B and weighed up the evidence about how to prevent it. You can use our information to talk to your doctor about whether you should be vaccinated against hepatitis B.

This information is about hepatitis B. We have a separate section that looks at [hepatitis C](#).

## What is hepatitis B?

Hepatitis B is a liver infection. You catch it from a virus that is carried in blood and other body fluids.

Some people who have hepatitis B don't even know they have it. They don't get any symptoms and the infection eventually goes away. But a few people get a serious infection that can last their whole lifetime.

Even if you don't feel ill you can pass the virus on to other people.

Hepatitis can stop your liver working properly.<sup>[1]</sup> There are several viruses that can cause different types of hepatitis. Each type of hepatitis is named after the virus that causes it. The most common types are hepatitis A, hepatitis B, and hepatitis C. In this section we are just looking at hepatitis B. We have another section about [hepatitis C](#).

The hepatitis B virus is carried in the blood and other body fluids (such as saliva, semen, and urine) of people who are infected. You can get infected with hepatitis B when body fluids from a person who is infected get into your body.<sup>[2]</sup>

You are most likely to catch hepatitis B if you come into contact with blood from someone who is infected. You can get hepatitis B if you:<sup>[3]</sup>

- Accidentally prick yourself with an infected needle. Doctors call this a needlestick injury
- Use infected needles (and other equipment) for taking illegal drugs

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- Share sharp objects such as razors, toothbrushes, or earrings with someone who is infected
- Have acupuncture, body piercing, or tattooing with needles that have been used on someone who is infected
- Have sex with an infected person without using a condom.

A pregnant woman with hepatitis B can also pass it to her baby.

You do not get hepatitis B through things like hugging or shaking hands with someone who has hepatitis B or by eating food that has been made by someone with hepatitis B. <sup>[2]</sup>

In the UK it is very rare to get infected from a blood transfusion. <sup>[3]</sup> This is because blood from donors is checked for the hepatitis B virus.

If you have hepatitis B you can pass the virus on to other people even if you feel well. There are things you should do to reduce the chances of this happening. For more information, see [What should I do if I have hepatitis B?](#)

Some people are more likely than others to get hepatitis B. For example, you are at a higher risk of getting hepatitis B if you inject illegal drugs or if you are a healthcare worker. For more information, see [Reducing your risk of catching hepatitis B](#).

There is a vaccine that can protect you against hepatitis B. For information about whether you should get the vaccine, see [Am I at risk of getting hepatitis B?](#)

### What are the symptoms of hepatitis B?

Some people get infected with the hepatitis B virus and don't know it. But most adults who have been infected with hepatitis B get some symptoms. Common symptoms are feeling tired and losing your appetite.

About 7 in 10 of people who are infected with hepatitis B get symptoms. Adults are more likely than children to get symptoms. <sup>[10]</sup> If you do get symptoms you will get them between six weeks and 21 weeks after you were infected with the hepatitis B virus.

These are the most common symptoms: <sup>[11]</sup>

- Feeling tired
- Losing your appetite
- Getting aches and pains
- Feeling sick

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- Vomiting
- Having urine that is darker than usual
- Having a yellowish tint to your skin and the whites of your eyes (doctors call this **jaundice**).

Other less common symptoms include:

- Losing weight
- Feeling depressed and anxious
- Having a fever
- Getting headaches
- Having problems sleeping
- Feeling itchy
- Getting discomfort in the right side of your abdomen.

But your doctor can't tell if you have hepatitis B just from your symptoms. You will need to have blood tests to see if you definitely have hepatitis B. Your doctor will be able to tell from the tests if you got the infection recently or if you have been carrying the virus in your blood for some time. Your doctor will also be able to tell from blood tests if you had hepatitis B in the past but your body got rid of it.

Your doctor might also want to do another blood test to see how well your liver is working. This is because the hepatitis B virus can damage your liver. Also, if you have hepatitis B, you may have other blood tests to see if you have any other infections.

Six months after you are diagnosed your doctor may also ask you to have a blood test to see if you still have the hepatitis B virus. <sup>[12]</sup>

### **How common is hepatitis B?**

In the UK hepatitis B is not very common. It's much more common in some other parts of the world.

For example:

- In Western Europe, North America, New Zealand, and Australia, less than 2 in every 100 people have hepatitis B

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- In parts of Eastern Europe, Africa, Asia, South America, and the Middle East, more than 8 in 100 people have hepatitis B. <sup>[13]</sup>

You can get a vaccine to protect you against hepatitis B. So if you're planning to travel abroad you should find out from your local travel clinic or GP whether you are going to an area where hepatitis B is common. Your GP will let you know if you should have a vaccination. <sup>[14]</sup>

As well as being vaccinated there are other things you can do to make it less likely you'll get hepatitis B when you are travelling. For more information, see [Reducing your risk of catching hepatitis B](#) .

### What treatments work for hepatitis B?

There are several treatments that can be used to prevent hepatitis B, or to treat the infection if you have it.

### Key points about treating hepatitis B

- A vaccine can prevent hepatitis B. In the UK, you might be offered the vaccine if your lifestyle or job puts you at risk of getting hepatitis B. To learn more, see [Am I at risk of getting hepatitis B?](#)
- People often fight off a hepatitis B infection naturally. If this happens you will have antibodies in your blood to stop you getting hepatitis B again. But for a small number of people this doesn't happen, and they get a long-term (chronic) infection with hepatitis B.
- If you have a long-term hepatitis B infection there are drugs that can stop the virus growing in your liver and causing more damage. But drugs probably won't get rid of hepatitis B completely.
- Treatments that fight the hepatitis B virus can have serious side effects. You need to talk to your doctor about the risks and benefits of these medicines, and about which might be best for you.

### Prevention and treatment of hepatitis B

We've looked separately at treatments to prevent hepatitis B, such as vaccines, and treatments to control hepatitis B if you already have it.

- [What treatments work to prevent hepatitis B?](#)
- [What treatments work if you have hepatitis B?](#)

## Treatment Group 1

### What treatments work to prevent hepatitis B?

The main way of preventing hepatitis B is a vaccine. (A vaccine is an injection that stops you getting a particular illness in the future.) For people who have already come into contact with the hepatitis B virus, shots of immunoglobulin can stop them getting infected. However, this treatment needs to be given quickly.

If you already have hepatitis B, you will probably recover without treatment. But a small number of people don't get better naturally. They may need treatment to stop the virus growing in their liver and causing damage. For more information, see [Treatments if you have hepatitis B](#).

### Key points about preventing hepatitis B

- The hepatitis B vaccine is safe, and the research shows that it works well. <sup>[20]</sup> <sup>[21]</sup>  
<sup>[22]</sup> <sup>[23]</sup>
- In the UK, the vaccine isn't offered to everyone. You might be offered the vaccine if your lifestyle or job puts you at risk of getting hepatitis B. For more information, see [Am I at risk of getting hepatitis B?](#)
- If you're pregnant and you have hepatitis B, your baby will need the hepatitis B vaccine soon after they're born.
- If an adult or baby comes into contact with the hepatitis B virus, they may be given injections of immunoglobulin. These destroy the virus. The injections work best when they're given within 24 hours of coming into contact with the virus.

We've looked at the best research and put the treatments into categories according to how well they work.

### Treatments to prevent hepatitis B

#### Treatments that are likely to work

- [Hepatitis B vaccine](#)

#### Other treatments

We haven't looked at the research on immunoglobulin in as much detail as we have for the other treatments we cover. (To read more, see Our method.) But we've included some information on this treatment as you may be interested in it.

- [Immunoglobulin](#)

## Treatment Group 2

### What treatments work if you have hepatitis B?

For many people, a short-term infection with hepatitis B will go away without treatment. If it doesn't, there are drugs that can help to control the virus.

### Key points about treating hepatitis B

- People often fight off a hepatitis B infection naturally. But a small number of people get a long-term (chronic) infection with hepatitis B.
- Drug treatments for long-term hepatitis B aim to stop the virus growing in your liver and causing more damage. But it's unlikely that the drugs will cure you by getting rid of hepatitis B completely.
- If you have long-term hepatitis B and are being treated with drugs, you will have regular blood tests to check on your liver. This is so doctors will know if the medicines are helping.
- Treatments that fight the hepatitis B virus can have serious side effects. You need to talk to your doctor about the risks and benefits of these medicines, and about which might be best for you.
- With some drugs, your hepatitis B can get a lot worse when you stop taking them. So don't stop taking these medicines without talking to your doctor. Your doctor will want to check on you regularly when you finish your course of treatment.

### Treatments if you have hepatitis B

#### Other treatments

We haven't looked at the research on these treatments in as much detail as usual. (To read more, see Our method.) But we've included some information on these drugs because you may be interested in them.

- [Interferon alfa and peginterferon alfa](#)
- [Lamivudine](#)
- [Adefovir](#)
- [Entecavir](#)
- [Tenofovir](#)

# Hepatitis B

## What will happen to me?

Most people recover from hepatitis B without treatment. But in a few people it is a serious illness that lasts a long time.

Hepatitis B can make your liver swell and stop it working properly. Later, you could get liver cancer, or a liver disease called cirrhosis.

You need a healthy liver. Your liver does many jobs to keep you alive. For example, it removes poisons from your blood. If your liver doesn't work properly you can get very ill.

## Types of hepatitis B

If you get hepatitis B you could have it for a short time and get better quickly, or you could have it for a long time. If you have it for a long time it can damage your liver. Doctors call these types of infections short term (acute) or long term (chronic).

### Short-term hepatitis B

More than 9 in 10 people who get hepatitis B get short-term hepatitis B (acute hepatitis B). They have mild symptoms and get better quickly. People who have short-term hepatitis B may not even know they have hepatitis B. Their bodies naturally get rid of the virus, and they have antibodies in their blood, which stop them getting infected by hepatitis B again. <sup>[15]</sup> It's quite rare for people with short-term hepatitis B to get seriously ill because of hepatitis B.

### Long-term hepatitis B

A small number of people who get hepatitis B (between 5 in 100 and 10 in 100) don't get better naturally. They still have the virus in their blood. <sup>[16]</sup> This is called long-term hepatitis B or chronic hepatitis B. Long-term hepatitis B is a complicated illness and can affect people in different ways.

Babies and children are more likely to get long-term hepatitis B. <sup>[17]</sup> Hepatitis B is also more likely to become long term if you have an illness that affects your immune system (your immune system includes all the parts of your body that fight off illness). For example, HIV is a disease that can seriously affect your immune system. (For more information, see our section on [HIV infection](#) .) If your immune system has been weakened by another illness it will not be able to protect you against hepatitis B. <sup>[17]</sup>

If you are diagnosed with hepatitis B your doctor will carry out blood tests to see if it has cleared up. If it doesn't clear up within six months your doctor will probably send you to see a specialist. You might need more tests, including a liver biopsy. A liver biopsy is where a doctor takes a tiny part of your liver for tests. This is the best way to see how the hepatitis B virus is affecting you. <sup>[18]</sup>

Your doctor will probably recommend that you have tests for other infections that you may have caught, especially hepatitis C. (For more information, see our information on [hepatitis C](#) .)

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Some people with hepatitis B look and feel well, but they can still infect other people. Doctors call them **chronic carriers**. If you are a chronic carrier, it means you have low levels of hepatitis B in your blood and it is not growing in your liver cells. If hepatitis B is not growing in your liver cells, you will not need drug treatment. But, in about 1 in 4 chronic carriers, hepatitis B gradually damages their liver. They can go on to get the liver disease called cirrhosis or they can get liver cancer. If you are a chronic carrier your doctor will give you blood tests every six to 12 months to check that your liver is not being damaged by hepatitis B.

However, you can still pass the virus on to other people if you are a carrier, so you need to be careful to stop this happening. For example, it is very important to use condoms when you have sex and not to share needles or anything else that could have your blood on it (like razors or jewellery that goes through piercings).<sup>[18]</sup> For more information, see [What should I do if I have hepatitis B?](#)

Some people with chronic hepatitis B might be quite ill and need drug treatment to limit how much damage the virus does. Drug treatments can also help to get rid of the virus in some people, but this is rare.<sup>[19]</sup> For more information, see [Treatments if you have hepatitis B](#).

### Liver problems

If you have long-term hepatitis B you are at greater risk of having problems with your liver.<sup>[17]</sup>

- Around 2 in 10 people with chronic hepatitis B go on to get a liver disease called cirrhosis. If you have cirrhosis, your liver doesn't work properly any more.
- Of these people, 9 in 100 will get liver cancer. Hepatitis B is the most common cause of liver cancer.<sup>[19]</sup>

In some people the liver stops working completely and they need a new, healthy liver from a donor. They will need to have a type of surgery called a liver transplant.

### Keeping yourself well

If you have hepatitis B you should have a vaccine against another type of hepatitis, called hepatitis A. If you have long-term hepatitis B you should try not to drink alcohol, as this can make the liver damage worse. Your GP might also strongly advise you to lose weight. And your doctor might advise you to avoid certain medicines, such as paracetamol. That's because some medicines may increase your risk of liver damage.

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## Treatments:

### Hepatitis B vaccine

In this section

## Hepatitis B

Vaccines for hepatitis B are made with a tiny, harmless part of the virus that cannot make you ill. <sup>[24]</sup> After having the vaccine your body makes **antibodies** against the hepatitis B virus that protect you from getting the actual virus in the future. So, if you ever come into contact with hepatitis B, your body fights it off without you feeling ill.

In the UK the vaccine isn't offered to everyone. You might be offered the vaccine if your lifestyle or job puts you at risk of getting hepatitis B. Babies are also given the vaccine soon after being born if their mother is infected with hepatitis B. For more information, see [Am I at risk of getting hepatitis B?](#)

Adults have the injection in the upper arm. Babies have it in their thigh. You need three injections for the vaccine to work properly. You have the first two injections one month apart and you get the third six months later. <sup>[25]</sup>

There's some good research showing that the hepatitis B vaccine works well for different groups of people. For example, one study from Alaska found that vaccinating newborn babies and using 'catch-up' vaccines for older children led to a big reduction in the number of people who were infected with hepatitis B in the following years. <sup>[26]</sup>

We also found four different studies that showed the vaccine is likely to protect adults whose job or lifestyle puts them at greater risk of getting hepatitis B. For example, one study of 2,701 healthcare workers who could have got exposed to body fluids found that the hepatitis B vaccine greatly reduced their risk of becoming infected. <sup>[23]</sup>

Three other studies looked at how well the vaccine worked in homosexual (gay) men. All the studies found that the vaccine helped to protect them against getting hepatitis B. <sup>[20] [21] [22]</sup>

If you are pregnant and have hepatitis B or are a chronic carrier, (you have low levels of hepatitis B in your blood but you look and feel well) you could pass the virus on to your baby. We found one study that looked at babies born to women who had the virus. It found that babies vaccinated soon after they were born were less likely to get the infection (and therefore the serious liver problems that could come with it). <sup>[27]</sup> Babies in this study were also given [hepatitis B immunoglobulin](#) .

The hepatitis B vaccine has been linked with some minor side effects. It might make your arm feel sore. In studies, a few people felt dizzy after the injection. <sup>[20] [22]</sup>

In one big study, the most common reactions were: <sup>[28]</sup>

- Redness and soreness where the injection was given
- Fainting
- Skin rashes.

About 1 in 5 people who had the vaccination got those reactions.

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Serious reactions to the hepatitis B vaccine are rare. One study found that adults who had the hepatitis B vaccine were slightly more likely to get **multiple sclerosis** and **arthritis**.<sup>[29]</sup> But the way this study was carried out means the results aren't that reliable. Another study found that getting the hepatitis B virus did not increase the risk of multiple sclerosis.<sup>[30]</sup>

Several big studies couldn't find any evidence to link the hepatitis B vaccine with any serious side effects in babies, children, or adults.<sup>[23] [31] [32] [33]</sup>

However, one study found that children who'd had the hepatitis B vaccine were more likely to have arthritis, an ear infection, or a throat infection (called pharyngitis). But the extra risk was very small.<sup>[34]</sup>

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## Immunoglobulin

In this section

If you think you have come into contact with hepatitis B you might be offered an injection called immunoglobulin. This treatment destroys the hepatitis B virus and stops it spreading in your body. It works best if you have the injection within 24 hours of coming into contact with the virus. But sometimes it can work up to a week later. When you are given immunoglobulin you just get one injection into your upper arm or thigh.<sup>[35]</sup>

This injection doesn't protect you from being infected with hepatitis B again in the future.

You might want to see a doctor to have this injection if you have:<sup>[35]</sup>

- Accidentally pricked yourself with an infected needle (doctors call this a needlestick injury)
- Shared a needle with someone who has, or could have, hepatitis B
- Had sex with someone who has, or could have, hepatitis B.

There hasn't been much research on immunoglobulin injections, but researchers think that they are likely to protect you against hepatitis B if you have been exposed to the virus. One study from Japan found that immunoglobulin, along with a vaccine, worked well to protect babies born to mothers who were infected with the hepatitis B virus.<sup>[27]</sup>

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## Interferon alfa and peginterferon alfa

In this section

If you have this treatment your doctor will give interferon alfa and peginterferon alfa together as an injection. Some people will get the injection every day for 16 weeks, and others will get it three times a week for 16 weeks. Sometimes, people need to have a

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course of interferon alfa and peginterferon alfa together for one to two years. Doctors will check your blood to see how long your treatment needs to be. <sup>[36]</sup>

Between 2 in 10 and 3 in 10 people get some side effects from interferon alfa and peginterferon alfa. These include fever, chills, headaches, and aching muscles. Some people become depressed. There are also some serious side effects that affect your blood. But doctors will examine you, ask you questions, and do blood tests to see if these side effects are likely to happen to you.

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### Lamivudine

In this section

This is a newer drug, and you take it as tablets. The brand names are Zeffix and Epivir.

If [interferon](#) does not work, you might be given lamivudine. Studies show that both drugs work about as well as each other. Lamivudine has fewer side effects than interferon. <sup>[36]</sup>

One study showed that the longer you take lamivudine, the better it works. The drug stops the virus multiplying in: <sup>[37]</sup>

- About 2 in 10 people after one year
- About 3 in 10 people after two years
- About 4 in 10 people after three years.

The main problem with lamivudine is that the virus might become resistant to the drug. This means that lamivudine stops working and can no longer keep the hepatitis B virus from multiplying. After three years, around 6 in 10 people find that lamivudine stops working because the virus they are infected with becomes resistant. <sup>[37]</sup>

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### Adefovir

In this section

You take adefovir (Hepsera) as tablets. It's used when other treatments haven't worked, or if you can't take other treatments because of side effects. <sup>[38]</sup>

Adefovir works just as well as [lamivudine](#). Hepatitis B is less likely to become resistant to adefovir than it is to lamivudine. <sup>[38]</sup> But adefovir can cause problems with your kidneys.

When you stop taking lamivudine or adefovir, you may suddenly get a lot worse, especially if you have other health problems, such as [HIV infection](#). This is because the hepatitis B virus can start to multiply more and do more damage after you stop treatment.

## Entecavir

In this section

You take entecavir (brand name Baraclude) as a tablet or a liquid. You need to take it at least two hours before or two hours after food.

Some studies have shown that people who take entecavir get less liver damage from their hepatitis B. <sup>[39]</sup>

Side effects of entecavir include a headache, stomach pain, diarrhoea, fatigue, and dizziness. <sup>[40]</sup> Serious side effects include a build-up of acid in your blood or severe liver problems. In rare cases, these can be fatal.

Doctors in the US have been warned that entecavir can make [HIV](#) harder to treat. <sup>[41]</sup> If you have HIV and you take entecavir before you start treatment with anti-HIV drugs, the medicines for HIV may not work so well. Talk to your doctor about getting an HIV test before you take entecavir.

Hepatitis B can get worse when you stop taking entecavir. You'll need check-ups for several months, or even longer, after you stop taking it.

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## Tenofovir

In this section

You take tenofovir as a tablet, with food. The brand name is Viread. It is used to treat hepatitis B infection, HIV infection, and both viruses together. It works by stopping the viruses reproducing properly. <sup>[42]</sup>

Tenofovir can cause side effects.

It's quite common to feel sick or be sick, get diarrhoea, or feel dizzy while taking tenofovir. This happens to at least 10 in 100 patients. It's also quite common to get headaches, have stomach pain, feel tired, become bloated, and get wind. This happens to up to 10 in 100 patients. <sup>[42]</sup>

There are also some rarer but more serious side effects. Up to 1 in 1,000 people get a condition called lactic acidosis, which means you have too much lactic acid in your blood. This can be life threatening. <sup>[42]</sup> These are symptoms that could mean lactic acidosis:

- Deep, rapid breathing
- Drowsiness
- Feeling sick, being sick, and having stomach pain.

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If you get these symptoms, you should see your doctor straight away.

Other rare side effects include inflammation of the pancreas (pancreatitis) and liver, and kidney failure.<sup>[42]</sup>

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## Further informations:

### What should I do if I have hepatitis B?

If you have hepatitis B you need to take precautions to make sure you don't infect other people.

Hepatitis B can stay alive on surfaces such as table tops, razor blades, and needles for at least a week.<sup>[4]</sup> If you inject illegal drugs you can infect other people through sharing needles. You should try to avoid sharing household items such as razor blades, toothbrushes, and towels, which may have infected body fluids on them.<sup>[5]</sup> Anyone you live with should also have the hepatitis B vaccine.

If you work in a job where you could spread hepatitis B you might be advised to change your job or make changes to how you do your job. Your doctor will tell you to see an occupational health doctor for more advice.<sup>[6]</sup>

You can spread hepatitis B by having unprotected sex (sex without a condom). So, if you have hepatitis B, you should use condoms during sexual intercourse or oral sex.

### Reducing your risk of catching hepatitis B

There are several ways to reduce your chances of getting hepatitis B.

You should:

- Not have unprotected sex (sex without a condom) with someone who you know has hepatitis B
- Always use a condom if you have sex with someone and you don't know whether they have hepatitis B
- Not share needles and other equipment if you use illegal drugs
- Avoid sharing household items such as razor blades and towels with people who have hepatitis B
- Make sure the needles are sterile if you are having acupuncture, a tattoo, or a body piercing.

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### Am I at risk of getting hepatitis B?

Some people have a greater chance of getting hepatitis B because of their job or their lifestyle. These people should consider getting a vaccine.

You should think about having a hepatitis B vaccine if you are: <sup>[7]</sup>

- Related to, live in the same house as, or are a sexual partner of someone with hepatitis B or someone who carries the virus
- Someone who injects illegal drugs. Even if you inject illegal drugs only occasionally you are still at higher risk of getting hepatitis B
- The sexual partner of someone who injects illegal drugs
- A close relative or contact of someone who injects illegal drugs
- At risk of getting infected with hepatitis B because of the job you do - for example, if you are a healthcare professional, work in a prison or a day care centre, or are a mortician or embalmer
- Someone who travels to parts of the world where hepatitis B is common
- A member of a family that is adopting a child from a country where hepatitis B is common. (For more information, see [How common is hepatitis B?](#) )
- A foster carer or if you live with foster children. If you take children for short-term, emergency foster care, you should be offered a hepatitis B vaccine. Some children requiring fostering may have been at increased risk of getting hepatitis B. If you are a permanent foster carer and you look after a child known to be at high risk of having hepatitis B, you should think about getting a vaccine
- Getting regular blood transfusions or blood products for another illness, such as haemophilia or long-term anaemia
- Someone with long-term kidney failure or liver disease
- In prison
- A man who has anal sex with men. Having anal sex puts you at greater risk of getting hepatitis B
- Someone who changes their sexual partner frequently.

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If you are a close family member, live in the same house, or are a sexual partner of someone with hepatitis B, you will also have a blood test when you get the vaccine. The blood test is to see if you have already been infected. If you have recently had sex with someone who has hepatitis B you might be offered an injection. This is called **post-exposure prophylaxis**. For more information, see [Treatments to prevent hepatitis B](#).

Babies born to mothers with hepatitis B are also at risk of getting the virus.<sup>[8]</sup> All pregnant women are screened for hepatitis B. If you are pregnant and found to have the infection or are a **chronic carrier** of the virus (you have a low level of the virus in your blood, but you look and feel well), your baby will be given the vaccine soon after they are born.

They will need further injections when they are 1 month, 2 months, and 12 months old.

<sup>[9]</sup> Your baby may also be given hepatitis B immunoglobulin.<sup>[7]</sup> To learn more, see [Treatments to prevent hepatitis B](#).

### Glossary:

#### Haemophilia

People with haemophilia have something missing from their blood, which stops their blood clotting properly. Haemophilia is a hereditary disease, which means you have it because of the genes you got from your parents.

#### anaemia

Anaemia is when you have too few red blood cells. Anaemia can make you get tired and breathless easily. It can also make you look pale. Anaemia can be caused by a number of different things, including problems with your diet, blood loss and some diseases.

#### immune system

Your immune system is made up of the parts of your body that fight infection. When bacteria or viruses get into your body, it's your immune system that kills them. Antibodies and white blood cells are part of your immune system. They travel in your blood and attack bacteria, viruses and other things that could damage your body.

#### multiple sclerosis

Multiple sclerosis (MS) is a disease that damages the walls of your nerves. No one knows for sure what causes it. If you have multiple sclerosis, you may lose feeling in certain parts of your body. You may also have trouble with your vision or problems controlling your movements.

#### arthritis

Arthritis is when your joints become inflamed, making them stiff and painful. There are different kinds of arthritis. Osteoarthritis is the most common type. It happens when the cartilage at the end of your bones becomes damaged and then starts to grow abnormally. Rheumatoid arthritis happens because your immune system attacks the lining of your joints.

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