NHS inclusion

Hepatitis and the liver –

A practitioners workbook

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About this workbook

This workbook is designed for you to work through in your own time, completing the activities as you go. The answers to the mini-quizzes are at the back of the workbook. It is beneficial if you have previously completed some basic Hepatitis related training prior to working through this workbook.

Workbook Aims

- To look at the liver and what it does
- Overview of liver disease
- Overview of Hepatitis B and C viruses
- Overview of Hepatitis B vaccine
- Overview of testing
- Overview of results
- Overview of treatment options
- **To get you thinking about your own service and what can be improved**
- **To support your service to work towards the elimination of Hepatitis C**

What does *Hepatitis* mean?

Hepatitis is essentially the Greek work for inflammation of the liver

noun.

1727, coined from Greek hepatos, or hepar "liver,"

+ -itis "inflammation."

There are different types of Hepatitis. Viral Hepatitis, such as Hepatitis B or C can be transmitted from one person to another. Alcoholic Hepatitis is not viral. Alcoholic Hepatitis and viral Hepatitis can both cause inflammation of the liver.

What is alcoholic hepatitis?

Alcoholic hepatitis is:

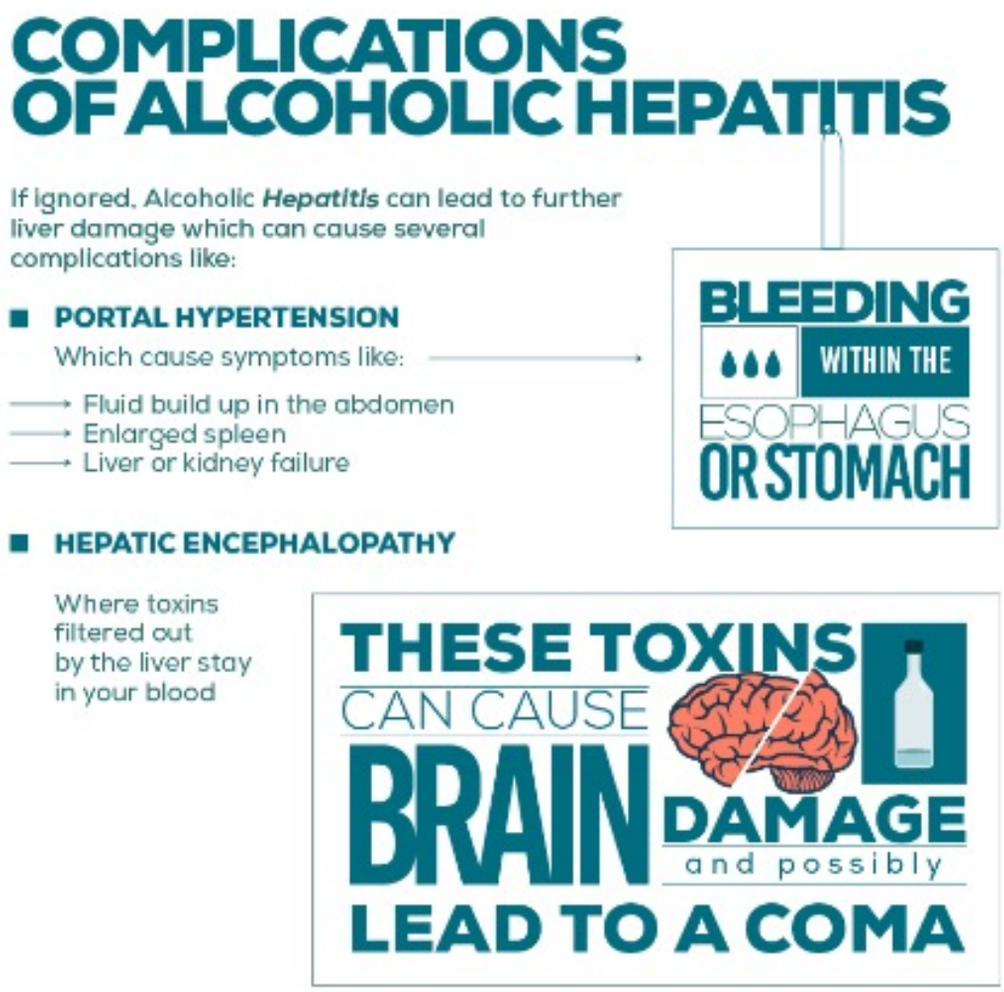
- Not viral – it cannot be transmitted from one person to another
- Caused by excessive alcohol use, normally over years
- Often found alongside 'fatty liver' (which we will discuss later in the workbook)
- More common in women
- Diagnosed by Liver Function Tests (LFTs) or an ultrasound
- Treatment available for severe cases

Further Resources
NHS Choices – Alcohol Related Liver Disease: https://www.nhs.uk/conditions/alcohol-related-liver-disease-arld/

Treatment for alcoholic hepatitis

The progression of Alcoholic Hepatitis and the harmful effect it can have on the body can be stopped if the person stops drinking in the early stages. If a person has damage to their liver caused by Alcoholic Hepatitis this may not be reversible, however it is still recommended that they stop drinking alcohol to prevent any further damage.

Treatment for Alcoholic Hepatitis may include medications that reduce inflammation in the liver and improve liver function.



Watch this 3 minute video on alcoholic hepatitis to learn more: *https://youtu.be/M_xb5hrCTOg*

What does the liver do?

The liver performs over 500 functions including these essential jobs:

- It **detoxes** drugs and alcohol
- It **degrades** hormones
- It **makes** substances (cholesterol, blood proteins, clotting proteins and lipoproteins)
- It **produces** bile (helps to digest fats)
- It **processes** nutrients (amino acids, fatty acids, glucose)
- It **stores** glycogen (a carbohydrate which produces short-term energy)
- It **removes** toxins
- It **processes** medicines
- Provides **resistance** to infection

Find your liver - Place your right hand over your lower right ribs and it will just about cover the area of your liver

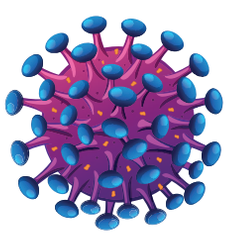
What does the liver do? *4 minute video: https://youtu.be/wbh3SjzydnQ*

Further Resources
The British Liver Trust – The Liver: https://britishlivertrust.org.uk/about-us/media-centre/5-facts-about-the-liver/?gclid=EAIaIQobChMIup2q6cij8AIV7O3mCh1dyQISEAAYAiAAEgJkAvD_BwE

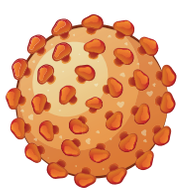
What is a virus?

- A microscopic parasite
- A virus is generally smaller than bacteria
- A virus needs a host to survive
- A virus cannot thrive and reproduce on its own
- Viruses borrow genetic material from the host in order to reproduce and be an ongoing infection
- The host's 'cellular machinery' allows viruses to produce RNA from their DNA (a process called transcription) and to build proteins based on the instructions encoded in their RNA (a process called translation)

How viruses reproduce *2 minute video: https://youtu.be/QHHrph7zDLw*

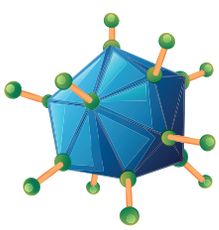


HIV

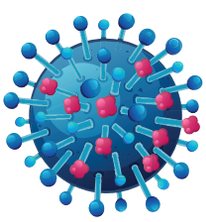


Hepatitis B

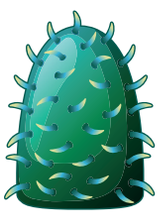
Ebola Virus



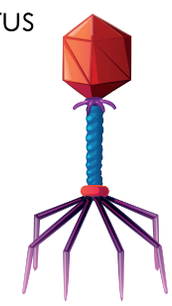
Adenovirus



Influenza



Rabies Virus



Bacteriophage

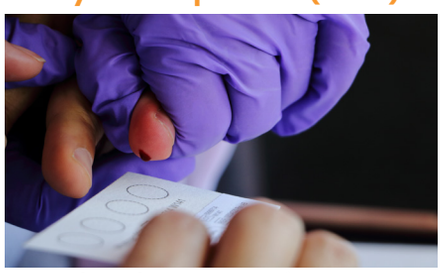
Further Resources
The Microbiology Society - Viruses: https://microbiologysociety.org/why-microbiology-matters/what-is-microbiology/viruses.html

Types of testing for hepatitis B, C and HIV

Prior to testing you should gain the service user's consent and deliver pre and post-test discussion to ensure the service user understands the tests you are going to take, why you are taking them, what different results may mean for them, to reassure them that support/ treatment is available and to agree how you will communicate the results.

There are many different types of testing available for Hepatitis B, C and HIV:

Dry Blood Spot Test (DBST)



Dry Blood Spot Testing involves taking blood from the finger using a lancet and drops of the blood are allowed to drip onto a card. This is sent to the lab in the post.

Instant result (Blood and Oral Fluid)

Instant result testing can be in the form of a blood sample or saliva sample and can take up to 60 minutes for the result.

If someone thinks they've been infected test them to see what their infection status is now, then re-test them in 3 months. Most viruses tend to have a different incubation period -retesting is important.

Capillary Blood Test (CBT)

Capillary Blood Tests take blood from the finger using a lancet which is put in a small vial. This is normally sent in the post to a lab.

Venous Blood Test

Venous Blood Testing involves a trained phlebotomist taking blood from a person's vein into tubes. This is sent to a lab.

Cepheid Machines

Cepheid Machines use a finger prick test which gives RNA results in 60 minutes

Different tests have different levels of reliability

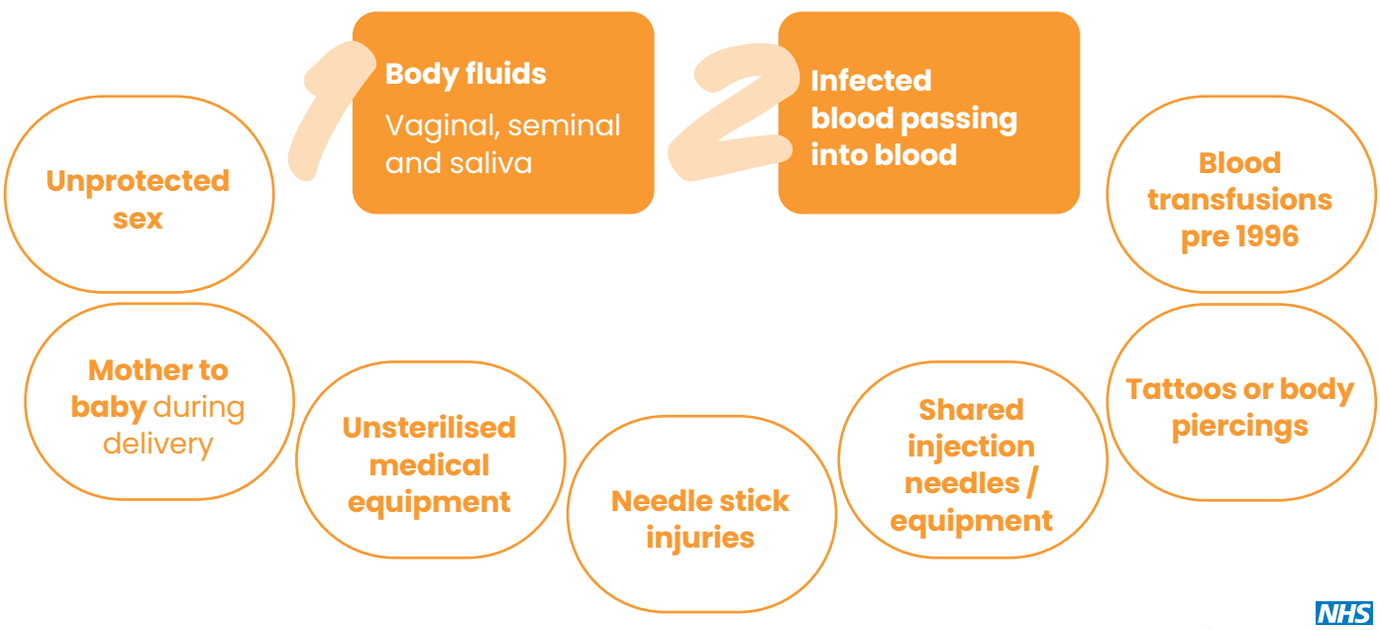
What is Hepatitis B?

- Hepatitis B is a type of viral Hepatitis that affects the liver
- Symptoms of infection include: Headache, fever, sickness and jaundice
- However, 3 out of 10 people are asymptomatic, meaning they have no symptoms at all
- The virus is spread through contact with body fluids, mostly blood, from an infected person
- Hepatitis B can survive outside the body for at least 7 days

Affects the liver	In UK commonly transmitted via IVDU and unprotected sex	50-100 times more infectious than HIV	Incubation period: 40-160 days
Every year 1 million people die worldwide from hep B despite it being preventable and treatable	240 million people worldwide living with chronic hep B infection	Most naturally clear the virus in 6 months then get immunity. 5-10% of adults don't clear the virus naturally	High prevalence in Sub-Saharan Africa, Asia, Pacific islands

Further Resources
The British Liver Trust - Hepatitis B Booklet for Service Users: https://britishlivertrust.org.uk/wp-content/uploads/Hep-B-website.pdf

Potential routes of transmission



Results

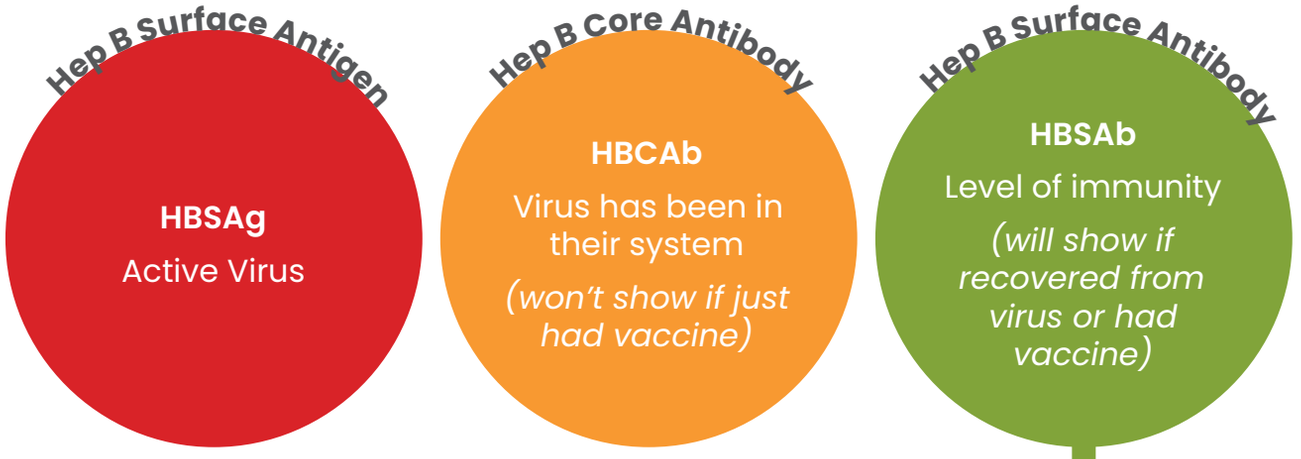
There are normally three different types of tests for Hepatitis B that are carried out in Drug and Alcohol Services.

- **HBSAg is the Hepatitis B Surface Antigen**. This is the test that tells you that someone has the active virus in their system.
- **HBCAb is the Hepatitis B Core Antibody**. This is the test that tells you if someone has ever had the virus in their system.

> If you were only testing for HBCAb and the result was positive all it would tell you is that the person has been in contact with the virus at some point. Without the HBSAg result you would not be able to tell if the person still had the virus or not. This is why these tests are normally completed together.

- **HBSAb is the Hepatitis B Surface Antibody**. It tests for the level of immunity a person has to the Hepatitis B virus.

> A person may get immunity to Hepatitis B by either having a course of Hepatitis B vaccinations (which produces antibodies should the person come into contact with the virus at any point) or by having the virus and the body 'clearing' it. Clearing the virus means that the body has fought off the infection and has produced antibodies.



Immunity level: ≥10 mIU/mL = sero-protection

A result of more than 10 means that a person has the minimum level of protection from the virus. If it is higher, the protection they have is higher

Further Resources
The British Liver Trust - Hepatitis B Booklet for Service Users: https://britishlivertrust.org.uk/wp-content/uploads/Hep-B-website.pdf

Hepatitis B results mini quiz

1. **Client A has the following results…what do they mean?**
   - HBSAg – positive
   - HBCAb – positive

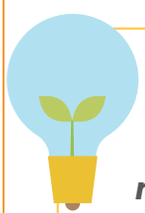
Your Answer _____

2. **Client B has the following results…what do they mean?**
   - HBSAg – negative
   - HBCAb – positive

Your Answer _____

3. **Client C has the following results…what do they mean?**
   - HBSAg – negative
   - HBCAb – negative
   - HBSAb – 12

Your Answer _____



Information on how vaccines are made, tested, monitored and licensed: *http://vk.ovg.ox.ac.uk/vk/vaccine-development*

- The Hepatitis B vaccine is not a live vaccine – this means there is no risk of getting Hepatitis B from the vaccine itself. It is essentially the outer coating of the virus. (PHE, 2014)
- The Hepatitis B vaccine's job is to trigger the immune system into recognizing the virus and producing antibodies.
- If a person already has a chronic Hepatitis B infection the vaccine won't offer them any additional protection
- Hepatitis D requires Hepatitis B to survive and therefore, if a person is vaccinated and protected by the Hepatitis B vaccine course they cannot acquire a Hepatitis D infection.
- The most common side effect of the Hepatitis B vaccine is a sore arm.
- When clinicians are deciding whether to administer the Hepatitis B vaccine they often have to look at the risks versus the benefits.
- Hepatitis B vaccinations are normally administered by a nurse who uses a Patient Group Direction (PGD).
- Service users who are pregnant may require a prescription to be written instead of being given this via a PGD
- Some people who are alcohol dependent or who have advanced liver disease may experience a poorer immune response to the vaccine (PHE, 2014).
- Some people who have kidney problems or who are on dialysis may require a double dose of the vaccine.
- Hepatitis B vaccines are normally administered according to a 'schedule'.
- Informed consent must be gained prior to administering Hepatitis B vaccinations.

Hepatitis B vaccine storage

For in-depth information about Engerix B *(a common type of Hepatitis B vaccine): https://www.medicines.org.uk/emc/product/1637/smpc#gref*

- Hepatitis B vaccines are less effective if they are too hot or too cold. When they are delivered they need to maintain what is called a 'Cold Chain'. This means that there needs to be assurance that the vaccines have been stored between 2-8°C wherever they have been (until the moment they are used).
- The temperature of medical fridges where they are stored need to be monitored and daily recordings of the minimum and maximum temperature the fridge has reached need to be taken.
- If the vaccine is stored outside of the cold chain it is considered 'off licence' and cannot be administered under PGD. The pharmacy Team should be contacted to discuss the next steps
- The vaccines should never be frozen – if they have been they will need to be destroyed.
- Clinicians will need to look at the vaccines to check them prior to administering them.
- Vaccine stock should be rotated to ensure those that are due to expire first are going to be used first.
- The vaccines should be placed in the middle of fridge and should avoid touching the sides.

Public Health England. Immunisation a infectious diseases: storage, distribution and disposal of vaccines. The Green Book Chapter 3. *Available at: www.gov.uk/government/publications/storage-distribution-and-disposal-of-vaccines-the-green-book-chapter-3*

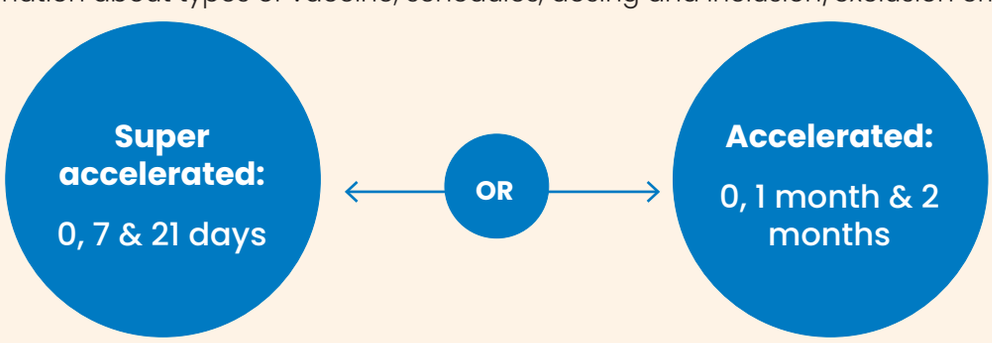
Vaccine incident guidance: PHE, 2020*: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/859773/PHE_vaccine_incident_guidance_January_2020.pdf*

Hepatitis B vaccine administration and schedules

- The Hepatitis B vaccine is normally given Intramuscularly (IM, into the muscle) in the deltoid muscle
- If someone is taking anti-coagulant medications (blood thinners) then the vaccine may be given Subcutaneously (into the sub-cutis, the layer of skin directly below the dermis and epidermis)
- The commonly used Hepatitis B vaccine, Engerix B, is pre-filled syringe containing a dose of 20mcgs
- The Engerix B Hepatitis B vaccine is given according to a 'schedule'. Within Drug and Alcohol Treatment Services the 'Super Accelerated' or the 'Accelerated' schedules are normally used.
- The first dose of the schedule is considered as 'Day 0'.
- For example, the 'Accelerated' schedule would be given on day 0 (first dose), 1 month after day 0 (second dose) and 6 months after day 0 (third dose).
- The 'Super Accelerated' schedule is a very quick way of giving a service user the course of Hepatitis B vaccines.
- The latest guidance suggests that we have a level of immunological memory of the vaccine if we have had a dose. This means that although we want to stay close the vaccine schedule if possible, if a person had one dose then missed their appointment for their second dose and didn't have it until a year later the course would not need to be re-started completely. The course would be re-commenced. Essentially the course would continue.

Vaccine schedules

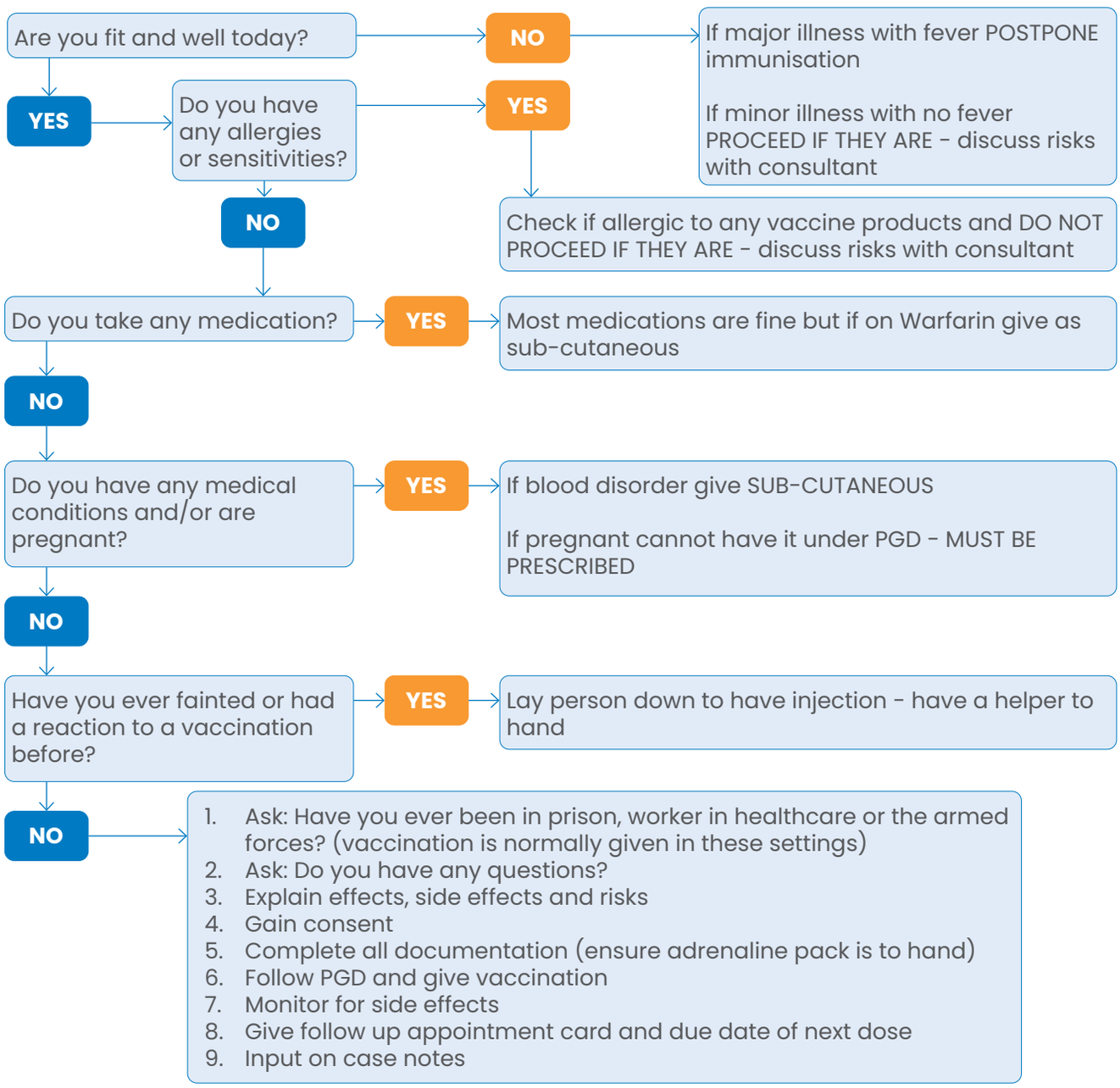
Different organisations may have different schedules they work to, always consult your local PGD for information about types of vaccine, schedules, dosing and inclusion/exclusion criteria)



A blood test 4 months after the vaccines are administered testing for HBSAb can tell you the level of immunity that person has and whether they have responded well to the vaccine. A booster dose should be given 12 months after the vaccines.

Hepatitis B vaccination checklist

Below is an example of the process a nurse may follow before giving a Hepatitis B vaccination (different organisations may have different processes).



Activity - find out from your service:

1. How many service users have had the full course of Hepatitis B vaccines?_____

2. How many service user have accepted the Hepatitis B vaccine and not yet had it?_____
_____

3. What do you think you can do to increase the amount of Hepatitis B vaccines given?_____
_____

Patient Group Directions (PGD)

- A Patient Group Direction (PGD) is a legal framework by which a vaccine/medication can be given to a group of people who meet a criteria, rather than having to get a prescription written for each service user.
- Before using the PGD the nurse must be specifically trained in immunisations and specifically that vaccine, must have signed the front page and have read the contents of the PGD.
- They must check that the service user meets the criteria and has given informed consent.

A PGD normally contains the following information:

- Responsibilities and competencies
- Details of the specific medication/vaccine that can be administered via the PGD
- Details of doses, schedules (if applicable), administration route (eg. IM) and storage
- The condition to be treated with the medication/vaccine (for example, for the prevention of hepatitis B infection)
- Inclusion and exclusion criteria (who can have it and who cannot)
- Cautions
- Interactions
- Circumstances in which medical advice would be sought
- Warnings/adverse reactions (and links to reporting these)
- Information about how to treat anaphylaxis
- Best practice on how to record information after administering

Anaphylaxis

Before giving any vaccine the person administering this must always check they have in date adrenaline to hand in case of an anaphylactic reaction

- There is a very small risk of anaphylactic reaction with the hepatitis B vaccine. All service users should be informed of this before it is administered and reassured that this is rare and that adrenaline is on hand should this happen.
- All staff administering vaccines must be up to date with their anaphylaxis training.
- Do not administer the hepatitis B vaccine if someone has had a previous severe reaction to the vaccine or any of the ingredients listed in the leaflet.
- Anaphylaxis can occur at any time.
- If anaphylaxis is suspected adrenaline must be given ASAP - It is a medical emergency - Dial 999 immediately!

Hepatitis B treatment

After exposure to the hepatitis B virus:

- Treatment after exposure = immunoglobulins (a preparation of antibodies that work against the hepatitis B virus) and antivirals which may provide short term protection.
- The hepatitis B vaccine itself can be effective at preventing infection if given quickly after exposure to the hepatitis B virus.
- If a patient or member of staff have been potentially exposed to the virus in the service follow your local sharps injury and exposure protocols.

For chronic hepatitis B:

Chronic hepatitis B = HBSAg in serum > 6 months

- A hepatitis B infection is considered a 'chronic infection' after the hepatitis B virus has been active in the blood for 6 months or more. This means that the body has not 'cleared' the virus naturally.
- Chronic hepatitis B is not yet curable, but it is treatable.
- Hepatitis B treatment can help to prevent cirrhosis (scarring of the liver), liver failure and liver cancer by reducing the amount of virus exerting an effect on the body while improving liver enzyme levels.

Risk of chronic hepatitis B depends on:

- Age (the very young)
- Immunological status
- 20-25% of people with Chronic Hepatitis B develop progressive liver disease and cirrhosis

Hepatitis B mini quiz

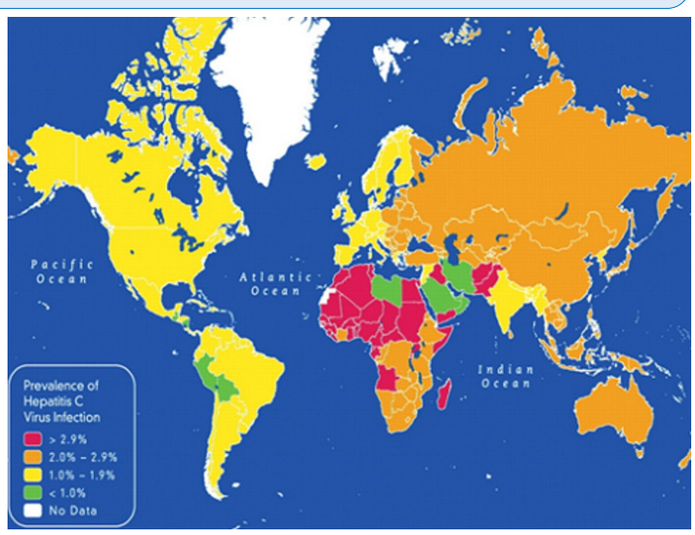
1. Hepatitis B is spread through contact with blood and bodily fluids – True or False?____
2. Hepatitis B is considered 'chronic' when it has been active (HBSAg) for how many months?_____
3. The hepatitis B vaccine (Engerix B) has to be stored in a fridge between_____^{0}C and _____^{0}C
4. The hepatitis B vaccine (Engerix B) can be given according to a super accelerated schedule. When would a person be given their first, second and third dose?_____ _____
5. Name two methods for taking a sample to test for hepatitis B_____ _____
6. How many days can hepatitis B survive outside of the body for? _____

Hepatitis C

What is Hepatitis C?

- Hepatitis C is a virus which affects the liver
- It is transmitted through hepatitis C infecting blood entering another person's blood (blood to blood)
- Similarly to hepatitis B not everyone experiences symptoms if they contract the virus, therefore, there is a risk it can go undiagnosed.
- There is no vaccination to prevent hepatitis C, however, there are very effective cures available
- Roughly 20% of people who become infected with hepatitis C clear the virus naturally within 6 months.
- If they don't clear the virus naturally within 6 months they will require treatment.
- Unlike hepatitis B, once you have had hepatitis C and have 'cleared' it naturally or through treatment you do not have any protection from future hepatitis C infections, therefore, you can contract hepatitis C again if you come into contact with it.
- Incubation period = 14-180 days.

70% unaware they have a chronic Hep C infection



Hepatitis C facts

200 million people worldwide thought to have a chronic hep C infection	Rates of chronic hep C are slowly declining but new infections remain the same	400,000 people infected in the UK, 90% acquired from drug use
1 in 4 people who inject drugs in the UK have chronic hep C	One of the leading causes of liver transplantation in the UK	High prevalence in Central and East Asia, North and West Africa

Further Resources
Shooting Up Report: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/953983/Shooting_Up_2020_report.pdf

Hepatitis C transmission risk factors

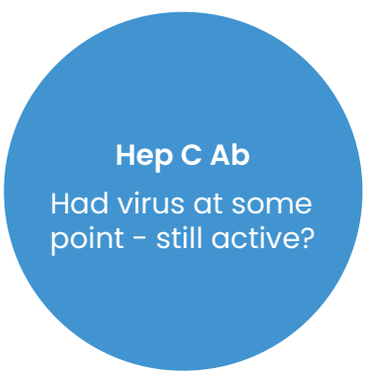
High transmission risk factors

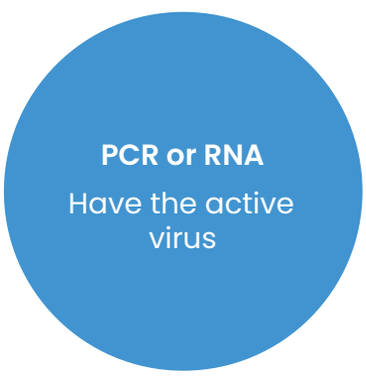
- IVDU/equipment
- Tattoos/Piercings
- Medical/dental treatment abroad
- Blood transfusion pre 1996

Lower transmission risk factors

- Sexual transmission = 1.5%
- 3% risk in men who have sex with men
- Mother to baby during labour – 6/100 (baby might get mother's antibodies so baby tested in 18 months
- Considered safe in breastfeeding –avoid if nipples cracked
- Higher mother to baby risk of transmission in presence of HIV coinfection <3%
- Toothbrushes and shaving equipment if open wound
- Menstrual blood during sex

Hepatitis C testing and results





Activity - find out from your service:

Find out how many service users in your service have accepted a test but have not yet been tested?_____

- To diagnose hepatitis C two tests are normally required if a person is unaware of their Hepatitis C status.
- The hepatitis C antibody (Hep C Ab) test alone only tells us if a person has come into contact with Hepatitis C. It does not tell us if the virus is still active. If a person has had Hepatitis C and 'cleared it' (either through treatment or naturally) the hep C Ab will always show as positive (however, in some people they can diminish over time).
- To be able to tell if someone has a current and active Hepatitis C infection there is a test that we can do called a RNA test. On some tests the hep C PCR test is the one that detects RNA in the blood.
- RNA tests can be completed through most types of tests: venous testing, capillary blood testing, dry blood spot testing and Cepheid machines.
- As PCR testing for RNA detects virus in the blood stream it is used to check if someone has 'spontaneously cleared' the Hepatitis C virus naturally after catching it or through undergoing treatment for hepatitis C, to see if the treatment has been successful and has a 'sustained viral response', also known as a SVR.
- During Hepatitis C treatment blood tests can be taken to monitor RNA levels but this is not done regularly in all areas. If the PCR/RNA test is 'not detected' that means the treatment is working.
- Hepatitis C testing should be offered to anyone at risk If a person has been potentially exposed to hepatitis C they should be tested when you see them but also in 3 months' time.

What to do if someone is hepatitis C positive

Inform them of their results, the risks and the treatment options (including telling them about new treatments) in person wherever possible. Always document clearly on the service user's notes when you have told them.

↓

Inform the person's GP.

↓

Document the results clearly on the service user's case notes.

↓

Refer them to the local Hepatology service (with consent) for assessment and treatment. Hepatology may take bloods, complete a fibroscan and talk to them about treatment options/ plans.

↓

Make arrangements for them to have the flowing bloods taken FBC, LFTs, GGT, and Us & Es, hep C RNA (if not already taken) and hep C genotype (either through the drug and alcohol service or hepatology).

↓

Link the person in with support if they consent. This might be with internal peer mentors or charities that offer support such as The Hepatitis C Trust.

↓

Re-visit harm reduction information and offer needle exchange and condoms if required.

↓

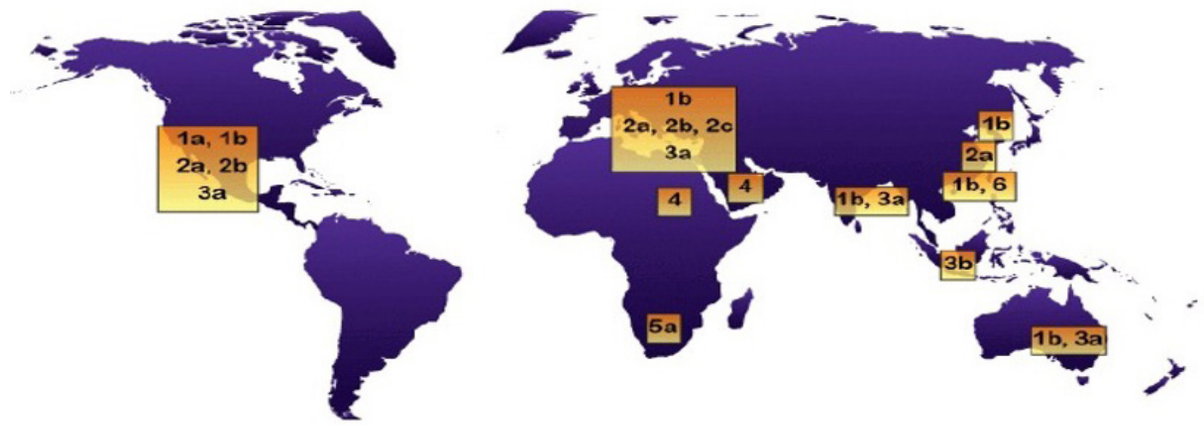
If the person is undergoing treatment they may require regular check-ins, blood monitoring (to check SVR) and may benefit from some extra support.

Fibroscans

- Fibroscans are commonly performed on people with Hepatitis, predominantly by trained Hepatology staff.
- It is a non-invasive procedure similar to an ultrasound and takes 10 minutes.
- It measures the stiffness of the liver.
- The level of stiffness measured by the fibroscan equates to how much scarring there is on the liver as a result of damage from the virus.
- Fibroscans measure the velocity of a vibration wave generated on the skin. It essentially measures the time the vibration wave takes to travel to liver.
- Fibroscan results are expressed in kilopascals (kPa).
- > 7.2 kPa indicates an increased likelihood of significant fibrosis (mild scarring).
- > 14.5 kPa can be seen in someone with cirrhosis (severe scarring).
- The average result for someone with no scarring is 5.3 kPa.
- Many Hepatology units now have portable fibroscanners which means they can be used with drug and alcohol services.

Genotypes

Genotype distribution of hepatitis C



- There,are 6 strains of Hepatitis C, referred to as Genotypes.
- They are known as Genotypes 1-6.
- Genotypes 1 and 3 are the most common in the UK.
- The genotype can sometimes influence which treatment is given to them, however, there are treatments which are 'pan-genotypic' meaning they are effective regardless of what genotype a person has.

Hepatitis C treatment

- 20% of people spontaneously clear the Hepatitis C virus naturally.
- For those who do not there are very effective treatments available.

The new treatments are called Direct Acting Antivirals (DAAs).

The DAAs are tablets which are taken for 8-12 weeks.	They have fewer side effects than the previous treatment for Hepatitis C (Pegylated Interferon α).	DAAs act directly on Hepatitis C at varying points in the viral life cycle

- Many service users may have experienced the old Hepatitis C treatment or known people who had it. The old treatment, known as Interferon, could cause side effects, was taken for up to a year and involved injections. It is important to tell service users that Interferon is no longer used and there are new treatments available.
- When a person is taking DAAs it is important to discuss any potential medication changes with the Hepatology Team to avoid any interactions. The following website can assist in determining if there are any interactions with the DAAs they are prescribed: https://www.hep-druginteractions.org/

Hepatitis C mini quiz

1. What percentage of people spontaneously/naturally clear the Hepatitis C virus? _____
2. If a test result comes back as positive for the Hep C Antibody (Hep C Ab) indicating they have had the Hepatitis C virus at some point, what test can be done to see if they have they active Hepatitis C virus? _____
3. What are the new treatments for Hepatitis C called? _____
4. How many genotypes for Hepatitis C are there globally? _____
5. Is there a vaccination for Hepatitis C? _____
6. Can someone get re-infected with Hepatitis C once they have cleared the virus spontaneously or through treatment? _____
7. If a person has the active Hepatitis C virus who do you need to refer them to for treatment? _____

The World Health Organisation (WHO) Viral Hepatitis Elimination Strategy

'A vision of a world where viral hepatitis transmission is halted and everyone living with viral hepatitis has access to safe, affordable and effective care and treatment'

The Strategy defined 5 key areas to assist in the elimination of viral Hepatitis by 2030. They aimed to:

- Decrease the number of cases of chronic Hepatitis infection to 0.9 million by 2030
- Reduce annual deaths from chronic hepatitis C to less than 0.5 million by 2030
- Strengthen each country's commitment to achieve health equity (equal access)
- Increase public awareness about the advances in hepatitis treatments, diagnostics and other technologies
- The strategy suggested that if we do nothing it's estimated between 2015-2030 there will be 20 million deaths from hepatitis B

- It was noted that cases of chronic Hepatitis C were increasing.
- And the strategy suggested that worldwide less than 1% of people with chronic Hepatitis were receiving treatment.

The Boston Consulting Group published a review of the efforts to eliminate Hepatitis across the globe in 2020 - Winning the race to eliminate Hepatitis C: *https://www.hepatichealth.com/wp-content/uploads/2020/09/Winning-the-Race-to-Eliminate-Hepatitis-C-pages.pdf*
This review suggested that although much work had been done further work, acceleration and commitment was required if we are to reach the WHO's elimination targets by 2030.

Activity **- List some of the barriers to service users accessing treatment below:**

Barriers to treatment

- **Lack of symptoms** – Many service users may not know they have contracted hepatitis C.
- **Past Experience with treatment** – bad experiences with treatment, institutions or professionals may all impact on a person's willingness to have treatment.
- **Peer reporting** – if someone's peers had a negative experience this may be what they believe will happen to them.
- **Lack of testing** – if testing is not available or easily accessible they may not know they have hepatitis.
- **Service user's lifestyle** – their ability to attend appointments, their drug/alcohol use and what that person's priorities are may all present as a barrier. This is why it is essential to really consider whether we can tailor testing and treatment to the service user's need.
- **Homelessness** – treatment should not be withheld on the basis that a person is homeless as many drug and alcohol services can support them with accessing their medication through a service or pharmacy.
- **Stigma** – Some service users may be reluctant to be treated or tested because they are concerned about what others may think of them. All efforts should be made to uphold people's dignity and work within confidential frameworks, being as discreet as possible when calling people into clinics.
- **Mental health** – someone who is suffering with mental health issues may struggle to engage with certain interventions.
- **Medication regime** (adherence) – people often struggle to adhere to medication regimes. If this is an issue with a service user explore what strategies they can put in place to remember or what you can do to remind them to take their medication.
- **Side effects** – side effects often make people less inclined to continue with medications. If a service user is experiencing side effects ask them to speak to hepatology.
- **Blood taking/fibroscanning** – think about ways you can be flexible in offering blood tests and fibroscans.
- **Transport** – think about ways that transport issues can be minimised (bringing the clinic to them).
- **Lack of knowledge** (staff and clients).
- **Partners with hep C** – some people may want to have treatment at the same time as their partners.
- **Communication difficulties** - staff to staff, staff to service users.
- **Co-morbidity or co-infection** – having another diagnosis may feel more complicated to manage.

Other hepatitis viruses

Hepatitis A:
A food/water-borne infection which can sometimes be spread through sexual contact with someone who is infected. Incubation period of about 4 weeks. It can rarely lead to liver failure. Antibodies can develop and protect people for many years. It can be fatal and is more risky for the elderly, children and infants.
British Liver Trust Booklet:
https://britishlivertrust.org.uk/wp-content/uploads/Hepatitis-A-web-version-HEA0417.pdf

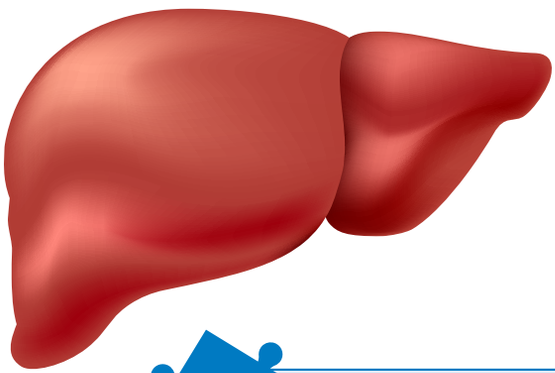
Hepatitis D:
An infection that causes the liver to become inflamed. This swelling can impair liver function and cause long-term liver problems, including liver scarring and cancer. Spread by contact with bodily fluids from an infected person. Hepatitis D can be prevented if a person receives a Hepatitis B infection. You can only have Hepatitis D when you have B, it does not act alone.

Hepatitis E:
Can cause liver disease. Transmitted via the faecal-oral route, mostly through contaminated water. Incubation period 2-10 weeks. There are two genotypes found in humans. The virus normally resolves itself within 2-6 weeks, occasionally acute liver disease can develop.
British Liver Trust Factsheet:
https://britishlivertrust.org.uk/wp-content/uploads/Hepatitis-E.-factsheet-V5-Final-nofax.pdf

What does a damaged liver mean for our service users?

It can affect drug metabolism & increase plasma levels of medicines

Drugs take longer to be cleared from the system



Increased risk of drug interactions

Increased risk of side effects

Where a methadone prescription is going to be started and a person has liver damage a lower dose is safer.

Liver disease symptoms

- There are over 100 types of liver disease.
- Women are more likely to get liver damage than men.
- Symptoms tend to show when a liver is more severely damaged.

The following are some symptoms of liver disease, however, it is worth noting that some can be caused by other conditions, not just liver disease, therefore, they should all be explored by a GP.

Abdominal pain, loss of appetite, flu-like symptoms, itching, abnormal stools or oedema.

Easily bruised – lack of clotting factors produced by liver.

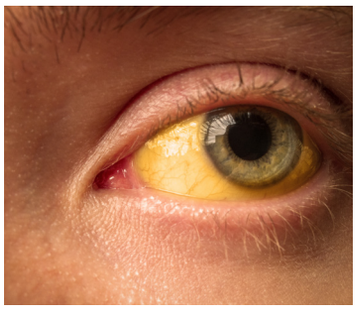
Dupuytren's Contracture

Occurs more frequently in patients with diabetes mellitus, seizure disorders (epilepsy), and alcoholism. Can be inherited.

Liver Damage

Jaundice

Damaged liver can't remove residue of old RBCs (bilirubin) from your blood. *It builds up and deposits in skin/ eyes causing a yellow colour.*



Palmar Erythema

Thought to be triggered by the increased estrogen and dilation of the blood vessels caused by cirrhosis. Also seen in pregnancy and Diabetes.

Spider Naevi (knee-vee)

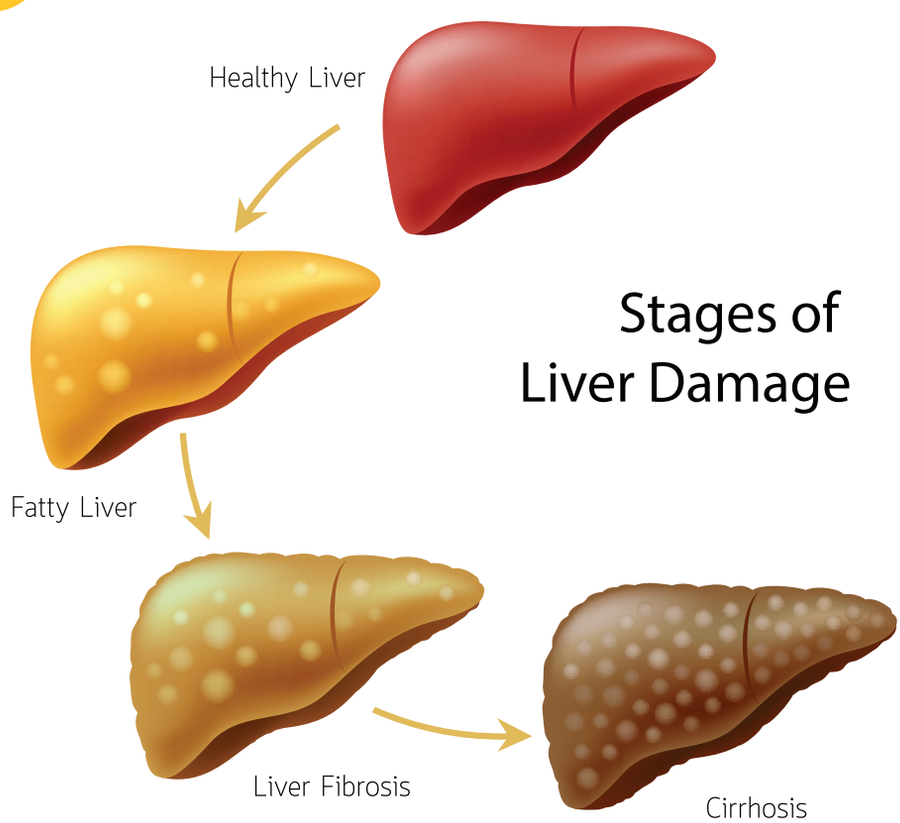
Occurs when lots of estrogen is present, as is the case with chronic liver disease or during pregnancy. *More common in people with alcohol-related liver cirrhosis than in those with cirrhosis not related to alcohol.*

Ascites

Build-up of fluid in abdomen. *Infection of this fluid, called peritonitis, can be deadly. Low-sodium diet and bed rest. Treated via: Diuretics, removal of ascitic fluid (therapeutic paracentesis), sometimes surgery to re-route blood flow (portosystemic shunting) or liver transplantation. For spontaneous bacterial peritonitis, antibiotics.*

The Love your Liver Screener – A short online screening tool anyone can use to have their liver health assessed, it provides guidance around looking after you liver better: *https://britishlivertrust.org.uk/at-risk-screener/*

Use this with screening tool with service users



Stages of Liver Damage

Fatty liver

6 minute video explaining NAFLD: *https://youtu.be/mjchJJxiHRk*

- **Fatty liver = when fat accounts for more than 5 - 10 % of the liver's weight.**
- The increase in fat means the liver struggles to metabolize fat fast enough. The excess fat is stored in liver cells, it accumulates and forms fatty liver.
- Alcohol misuse is the most common cause and fatty liver can progress to cirrhosis or liver failure.
- If the fatty liver progresses to cirrhosis there is an increased risk of liver failure and the risk of death rises significantly.
- 50% of those who progress to cirrhosis from fatty liver will develop liver failure and sometimes the survival rate is often no more than two years.
- **There are 2 types of fatty liver:**

1

Nonalcoholic fatty liver disease (NAFLD)

When the liver has difficulty breaking down fats, which causes a buildup in the liver tissue. Not related to alcohol. Diagnosed when fat accounts for more than 5 to 10 % of liver's weight: *https://britishlivertrust.org.uk/information-and-support/living-with-a-liver-condition/liver-conditions/non-alcohol-related-fatty-liver-disease/*

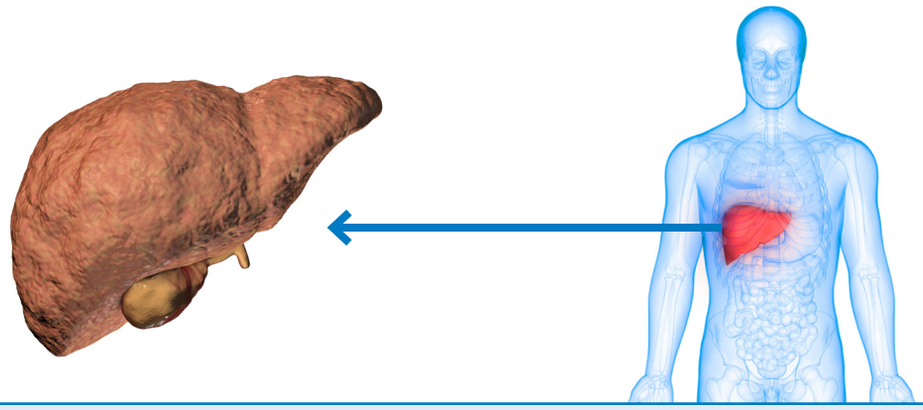
2

Alcoholic fatty liver

Earliest stage of alcohol-related liver disease. Liver cannot break down fats due to damage.

Liver Damage

Fibrosis



- Fibrosis is mild scarring normally caused by prolonged damage to liver. Scar tissue replaces the damaged cells. This means the liver cannot function as well as it normally would.
- The scar tissue restricts blood flow in liver causing the liver cells to die and more scar tissue to form.
- When fibrosis progresses to and distorts the liver architecture with formation of nodules, it is considered stage 4 fibrosis or cirrhosis.

Cirrhosis

Cirrhosis (10 minute video):
https://youtu.be/XJQn8MXnTWg

- Cirrhosis is advanced scarring which can lead to liver failure and death.
- In the UK the most common causes of cirrhosis are:

Too much alcohol over many years (normally after 10 + years of heavy drinking).

Being infected with hepatitis for a long time (Hepatitis C).

Non-alcoholic steatohepatitis - a severe form of non-alcoholic fatty liver disease, liver inflamed due to build-up of excess fat.

Some of the risks include:

It can cause an increased resistance to insulin. Those with cirrhosis and diabetes may need to be closely monitored.

The blood restriction from cirrhosis can increase the pressure in the vein that carries blood from the intestine to the liver.

Post-menopausal women are more at risk of advancing cirrhosis because estrogen is no longer protecting them.

It can cause oesophageal varices. They need immediate medical attention if this happens.

Amenorrhea (lack of periods) can be a symptom and in men, gynecomastia, a swollen scrotum or shrunken testicles.

They can develop encephalopathy. Symptoms include: confusion, drowsiness and problems concentrating:
https://britishlivertrust.org.uk/information-and-support/living-with-a-liver-condition/liver-conditions/hepatic-encephalopathy/

- The term decompensated cirrhosis can mean the development of jaundice, ascites, variceal hemorrhage, or hepatic encephalopathy. Those with decompensated cirrhosis may need a liver transplant.

Cancer – Hepatocellular Carcinoma

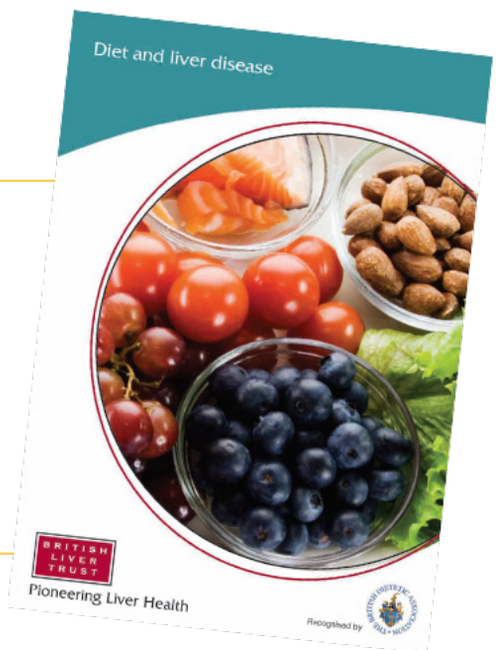
- This is the most common type of primary liver cancer and the 4th most common cause of cancer-related death.
- Hepatocellular carcinoma can be caused by chronic liver diseases, such as cirrhosis resulting from hepatitis B or hepatitis C.
- It can sometimes be cured by surgery or transplant but sometimes this is not always possible due to late diagnosis and impaired liver function.
- It is different to 'secondary' liver cancers, which spread to the liver from other organs.

Further Resources
British Liver Trust – Cancer Factsheets for Service Users: https://britishlivertrust.org.uk/information-and-support/living-with-a-liver-condition/liver-conditions/liver-cancer/

Steps to a healthy liver

Can be given to service users:

The British Liver Trust – 'Diet and Liver Disease': – A short online screening tool anyone can use to have their liver health assessed, it provides guidance around looking after you liver better: *https://www.britishlivertrust.org.uk/wp-content/uploads/44951-DLD-BLT-A5-Booklet-web-compressed.pdf*



- If the liver is damaged it will struggle to store glycogen. This means that energy might be taken from muscle tissue instead. They may need more calories/protein in their diet.
- Encourage people to eat little and often.
- Maintain a low salt intake.
- Obesity can speed up the effects of hepatitis C on the liver.
- Refer to a dietician in cases of severe liver disease.

Coffee consumption and the liver - the potential benefits: The British Liver Trust (2016) https://www.britishlivertrust.org.uk/wp-content/uploads/The-health-benefits-of-coffee-BLT-report-June-2016.pdf

Liver Function Tests (LFTs)

For more information about specific blood tests and results go to Lab Tests Online *https://labtestsonline.org.uk/tests/ggt-test*

LFTs:

- **Alanine Transaminase (ALT)** - Enzyme that helps process proteins. Large amounts normally occur in the liver cells. It normally rises in the blood if there is hepatitis. More specific to the liver.
- **Aspartate Aminotransferase (AST)** - Enzyme normally found inside liver cells. High levels normally indicate possible liver impairment. It can also be raised if there is a heart or skeletal muscle which is damaged. Less specific to the liver.
- **Alkaline Phosphatase (ALP)** - Occurs in the liver cells next to the bile ducts and in bone. Raised in some types of liver and bone disease.
- **Albumin** - Protein made by the liver. It circulates in the bloodstream. Levels are low if the liver is damaged.
- **Bilirubin** - Made from Haemoglobin (when red blood cells break down), the content of bile. Liver cells take bilirubin and attach sugars to it - called conjugated bilirubin. A raised level of conjugated bilirubin occurs in liver and bile duct problems. It could be caused by Hepatitis, a tumour in the pancreas or a gall stone stuck in the common bile duct. A rise in unconjugated bilirubin occurs when there is an excessive breakdown of the red blood cells; anaemia.

Other blood tests:

- **Gamma-Glutamytransferase (Gamma GT or GGT)** - Has to be requested specifically. Enzyme that occurs in the liver cells, a high level of GGT is associated with heavy drinking. The liver uses GGT to clear alcohol from the body. Indicative only and not very specific.
- **Blood clotting tests (such as INR)** - Blood clotting tests may indicate liver disease as the liver makes the proteins for clotting.
- **AFP** - which looks for tumour markers. Only initiated by Hepatology and not routinely tested by drug and alcohol treatment services.

- Normal LFT results do not exclude the risk that liver disease is present....
- Lots of medications can be associated with abnormal liver values (eg. mirtazapine, trazadone, sertraline, risperidone, NSAIDs, flucloxacillin, aspirin, omeprazole, paracetamol etc).

Liver damage mini quiz

1. What are the two types of fatty liver called? _____

2. What is fibrosis of the liver? _____

3. What is cirrhosis of the liver? _____

4. Name two of the Liver Function Tests _____

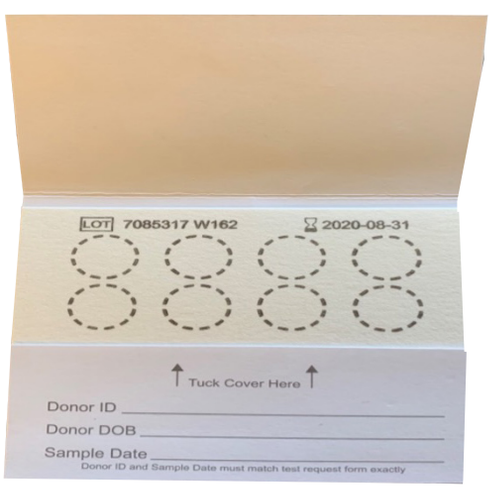
Guide to good Dry Blood Spot Testing (DBST)

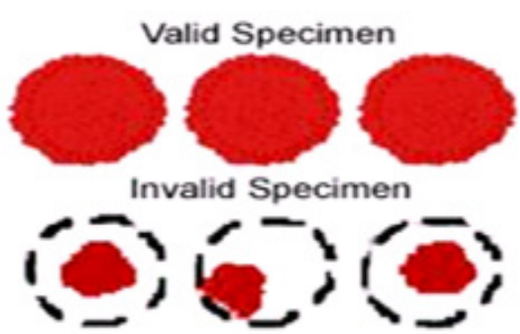
Some test results can come back as 'indeterminate' meaning you still may not know if a person is positive or negative. Below is a list of things you can do to minimise the risk of getting indeterminate results with your service users. There can also sometime be issues related to getting a decent amount of blood required to process the test.

DBST TIPS:

- At least half fill the circles on the blood card (but be aware that some tests will require the whole circle to be filled).
- Support the service user to drip their blood onto the blood card as opposed to 'dabbing it' on the card with their finger.
- Always allow the blood card to dry.
- If a person has difficulty getting enough blood from their finger they can let their arm hang down to encourage blood flow to the hand.
- Gently milk finger from palm to finger-tip. Do not squeeze as this will impede blood flow.
- Pricking fingers closer to the little finger may bleed better and avoid areas on the finger where there are tough bits of skin.
- Asking someone to wash their hands in warm water before taking the sample can also help with blood flow.
- Before you start using a new test look at the manufacturer's guide to ensure you are maximising the chances of taking a good test.
- To minimise the chances of tests not being process due to missing or mismatched information ensure you have a process in place to complete all of the paperwork that is required.

Example blood card sample





Activity - Think about your service.....

What are you doing well?

What can you or your service do to improve?

Name one thing you will commit to do to help the elimination of hepatitis C

Resources, videos and guidance

Videos	
Alcoholic Hepatitis 3 minute video:	*https://youtu.be/M_xb5hrCTOg*
What does the liver do? 4 minute video:	*https://youtu.be/wbh3SjzydnQ*
How viruses reproduce 2 minute video:	*https://youtu.be/QHHrph7zDLw*
Passive and active immunity 15 minute video:	*https://youtu.be/XrwMglPmUaQ*
How the immune system works 5 minute video:	*https://youtu.be/PSRJfaAYkW4*
NAFLD 6 minute video:	*https://youtu.be/mjchJJxiHRk*
Cirrhosis 10 minute video:	*https://youtu.be/XJQn8MXnTWg*
Jaundice 10 minute video:	*https://youtu.be/6akhmBqAe2g*
PCR 10 minute video:	*https://youtu.be/gubLAtn2o4s*

Guidance	
Recording BBVs on Data Set P:	*https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/873096/PBBV_guidance_NDTMS_core_dataset.pdf*
Vaccine incident guidance: PHE, 2020:	*https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/859773/PHE_vaccine_incident_guidance_January_2020.pdf*
Public Health England. Immunisation against infectious diseases: storage, distribution and disposal of vaccines. The Green Book Chapter 3. Available at:	*www.gov.uk/government/publications/storage-distribution-and-disposal-of-vaccines-the-green-book-chapter-3*
World Health Organisation: The global health sector strategy on viral hepatitis 2016-2021: towards ending viral hepatitis. 2016. Available at:	*https://apps.who.int/iris/bitstream/handle/10665/246177/WHO-HIV-2016.06-eng.pdf;jsessionid=B06F092998EC02C945058A5FE29EEDCB?sequence=1*
The Boston Consulting Group (2020) Winning the race to eliminate Hepatitis C:	*https://www.hepatichealth.com/wp-content/uploads/2020/09/Winning-the-Race-to-Eliminate-Hepatitis-C-pages.pdf*
The British Liver Trust - 'Diet and Liver Disease':	*https://www.britishlivertrust.org.uk/wp-content/uploads/44951-DLD-BLT-A5-Booklet-web-compressed.pdf*
Resuscitation Council (2016) Emergency Treatment of Anaphylactic Reactions:	*https://www.resus.org.uk/sites/default/files/2020-06/EmergencyTreatmentOfAnaphylacticReactions%20%281%29.pdf*
Shooting Up Report:	*https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/953983/Shooting_Up_2020_report.pdf*

Additional resources

Additional Resources	
Hep C U Later	*www.hepculater.com*
Information on how vaccines are made, tested, monitored and licensed:	*http://vk.ovg.ox.ac.uk/vk/vaccine-development*
Engerix B SPC (Hep B vaccine):	*https://www.medicines.org.uk/emc/product/1637/smpc#gref*
Hep Drug Interactions Checker:	*https://www.hep-druginteractions.org/*
Lab Tests Online:	*Liver Function Tests - Understand the Test (labtestsonline.org.uk)*
British Liver Trust Cirrhosis Booklet	*https://britishlivertrust.org.uk/wp-content/uploads/44952-Cirrhosis-DL-booklet-Web-compressed.pdf*
NHS Choices – Alcohol Related Liver Disease:	*https://www.nhs.uk/conditions/alcohol-related-liver-disease-arld/*
The Microbiology Society – Viruses:	*https://microbiologysociety.org/why-microbiology-matters/what-is-microbiology/viruses.html*
The British Liver Trust - Hepatitis B Booklet for Service Users:	*https://britishlivertrust.org.uk/wp-content/uploads/Hep-B-website.pdf*
Hepatitis A British Liver Trust Booklet:	*https://britishlivertrust.org.uk/wp-content/uploads/Hepatitis-A-web-version-HEA0417.pdf*
Hepatitis E British Liver Trust Factsheet:	*https://britishlivertrust.org.uk/wp-content/uploads/Hepatitis-E.-factsheet-V5-Final-nofax.pdf*
The Love your Liver Screener:	*https://britishlivertrust.org.uk/at-risk-screener/*
NAFLD:	*https://britishlivertrust.org.uk/information-and-support/living-with-a-liver-condition/liver-conditions/non-alcohol-related-fatty-liver-disease/*
Encephalopathy:	*https://britishlivertrust.org.uk/information-and-support/living-with-a-liver-condition/liver-conditions/hepatic-encephalopathy/*
British Liver Trust – Cancer Factsheets for Service Users:	*https://britishlivertrust.org.uk/information-and-support/living-with-a-liver-condition/liver-conditions/liver-cancer/*

Quiz Answers	
Hepatitis B Results Mini Quiz -(Page 10)	
1.	*Client A has the active hepatitis B virus*
2.	*Client B has had the Hepatitis B virus but has cleared it.*
3.	*Client C has had the Hepatitis B vaccine. Their level of immunity means they are protected but they may require a booster.*
Hepatitis B Mini Quiz - (Page 15)	
Hepatitis B is spread through contact with blood and bodily fluids	*True*
Hepatitis B is considered 'chronic' when it has been active (HBSAg) for how many months?	*6 months*
The hepatitis B vaccine (Engerix B) has to be stored in a fridge between	*2^0C and 8^0C*
The hepatitis B vaccine (Engerix B) can be given according to a super accelerated schedule. When would a person be given their first, second and third dose?	*Day 0, day 7 and day 21*
Name two methods for taking a sample to test for hepatitis B.	*Capillary Blood Testing, Dry Blood Spot Testing, Instant Result Testing (blood or saliva), Venous Testing.*
How many days can hepatitis B survive outside of the body for?	*At least 7 days*

Quiz Answers	
Hepatitis C Results Mini Quiz - (Page 20)	
What percentage of people spontaneously/naturally clear the Hepatitis C virus?	*20%*
If a test result comes back as positive for the Hep C Antibody (Hep C Ab) indicating they have had the Hepatitis C virus at some point, what test can be done to see if they have they active Hepatitis C virus?	*RNA or PCR (depending on what method of testing you are using)*
What are the new treatments for Hepatitis C called?	*Direct Acting Antivirals (DAAs)*
How many genotypes for Hepatitis C are there globally?	*6*
Is there a vaccination for Hepatitis C?	*No*
Can someone get re-infected with Hepatitis C once they have cleared the virus spontaneously or through treatment	*Yes*
If a person has the active Hepatitis C virus who do you need to refer them to for treatment?	*Hepatology*
Liver damage mini quiz - (Page 28)	
What are the two types of fatty liver called?	*Non-Alcoholic Fatty Liver Disease (NAFLD) and Alcoholic Fatty Liver Disease*
What is fibrosis of the liver?	*Mild scarring*
What is cirrhosis of the liver?	*Advanced scarring*
Name two of the Liver Function Tests	*AST, ALT, ALP, Bilirubin, Albumin*