Public Health England

Protecting and improving the nation's health

Interim guidance on the public health management and control of acute hepatitis B

November 2019

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Public health control and management acute hepatitis B

Background

The hepatitis B virus (HBV) is a blood borne virus which causes an infection of the liver. It can cause a wide range of symptoms varying from a sub clinical or flu like illness to fulminant hepatic necrosis. Acute HBV infection may lead to an acute hepatitis. Infection, particularly when asymptomatic may also lead to a chronic infection which puts the individual at an increased risk of chronic liver disease and hepatocellular carcinoma. Clinically, patients with hepatitis B may present with anorexia, malaise, nausea, and right upper quadrant pain. A fever may accompany these symptoms but is usually quite mild. Jaundice only occurs in 30-50% of adult cases and is absent in the majority of children acutely infected with HBV[1].

Incubation period

The incubation period from infection to the appearance of symptoms is around 12 weeks (range 40 to 160 days).

Infectious period

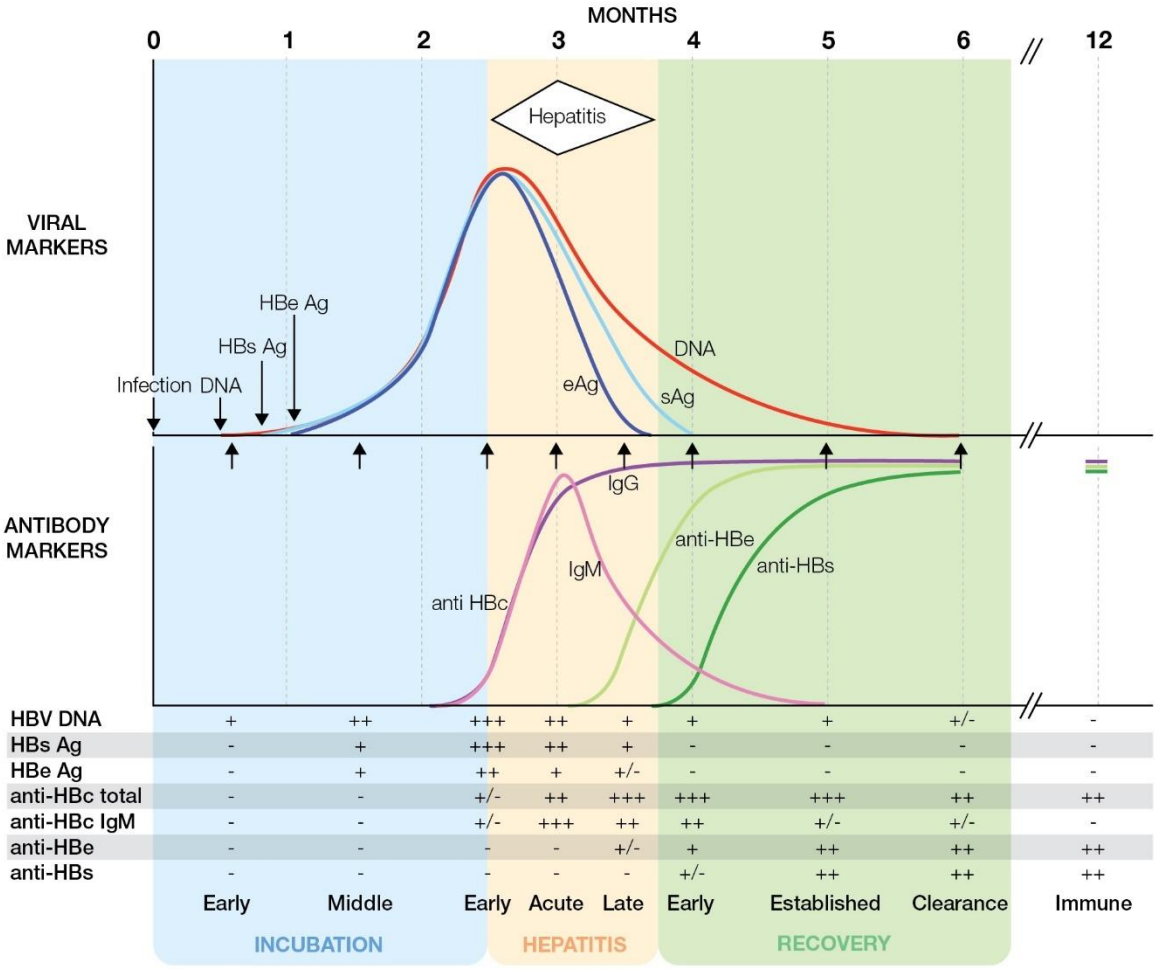
A person is infectious for the duration of illness whilst HBsAg (the surface antigen) remains present. Appropriate infection prevention methods should be employed whilst the patient remains infectious.

Transmission

Transmission occurs through sexual contact, blood to blood contact through percutaneous exposure and perinatal transmission from mother to child. Perinatal infections and infections in early life very frequently lead to lifelong persistent chronic hepatitis B infection.

Diagnosis is based upon the presence of serological markers in plasma or serum. Different combinations of these markers (antigens and antibodies) indicate whether the disease is acute or chronic or whether the patient is immune or susceptible to infection. Fig 1 below shows a time course of infection

Figure 1[2]



Serological Marker	Definition
HBV DNA	This is the viral genome; quantification indicates the level of replication and is used to determine response to therapy. Characterisation (sequencing) is used to define viral genotype, often used in defining transmission networks.
Hepatitis B Surface Antigen (HBsAg)	This is the envelope around the virus, which is embedded within the envelope of the virus, and can be detected in both the acute and chronic phase of infection. Presence of HBsAg indicates that the person is infected and potentially infectious. Quantification helps to define the nature of the infection
Hepatitis B e antigen (HBeAg)	This is a cleavage product of the nucleocapsid protein detectable in the serum during both the early phases of acute infection and some persistent infection which may be detectable. Its presence is usually associated with a relatively high level of virus replication. Irrespective of e antigen and antibody status all patients who test positive for Hepatitis B surface antigen should be regarded as infectious

Antibody to HBcAg (anti-HBc)	Indicates current or previous hepatitis B infection. It appears at the onset of symptoms in acute hepatitis B infection and persists for life. In very early acute infection it may be absent
IgM antibody to hepatitis core antigen (IgM anti-HBc)	Indicates recent HBV infection. Quantification may be useful to distinguish acute and chronic in these cases. It may also be present in persons undergoing flare ups. Approximately 20% of those who have positive IgM antibody will be chronic infection rather than acute infection
Antibody to HBeAg (Anti-HBe)	Present following clearance of HBeAg from the plasma. At the time of diagnosis many acute infections have already produced e antigen and usually indicates lower levels of circulating hepatitis B virus.
Antibody to HBsAg (anti-HBs)	Indicates recovery and immunity to hepatitis B virus infection. Anti- HBs is also detectable in those who have been immunised. Quantification is used to measure the response to the vaccine
Hepatitis B core antigen (HBcAg)	Forms the nucleocapsid of the 42nm virus particle. It may be detectable in plasma/serum by reference testing
Mutant (e null) viruses	Constitutively unable to express HBeAg and represent an escape from immunological control in persistent infection. Associated with anti-HBe, they may cause high levels of circulating viruses and are associated with disease progression.

Laboratory testing

Additional tests to the above markers for hepatitis B include quantification of HBV DNA (often referred to as HBV viral load) and HBV core avidity testing. This additional testing and interpretation of results can be obtained from PHE Colindale's Blood Borne Virus Unit.

Definition

For surveillance purposes, acute hepatitis B infection is defined as HBsAg positive and anti-HBc IgM positive with abnormal liver function tests plus a clinical pattern consistent with acute viral hepatitis. As acute hepatitis B flares can occur during chronic persistent infection, HBV core avidity testing may be done to differentiate between an acute and chronic core IgM infection and a follow up sample should be obtained. PHE Colindale's Blood Borne Virus Unit provides reference laboratory services for hepatitis B[3].

Epidemiology

PHE reports an annual incidence for England of hepatitis B of 0.80 per 100 000 population for 2017. This is slightly lower than in previous years showing a slight downward trend[4]. The incidence remains higher in males than in females[3]. Index cases of hepatitis B act as sentinel infections, it is important to identify persistently infected individuals and their source to provide surveillance for HBV. This is necessary to target prevention and control measures for specific populations[5].

The hepatitis B immunisation programme aims to immunise specific individuals both pre and post exposure depending on circumstances. This includes any individual who is at a high risk of exposure to the virus or complications and the hepatitis B vaccine is also now part of the routine immunisation programme for all infants in the UK[6].

The vaccine is effective in preventing infection in both children and adults through stimulating the production of protective levels of anti-HBs (humeral) and the induction of a cytotoxic T cell response (cellular). Hepatitis B immunisation is also effective at preventing infection post exposure.

Hepatitis B Immunoglobulin (HBIG) is prepared from the plasma of donors whose plasma contains high levels of anti-HBs. This is most likely due to immunisation but may be due to recovery from previous infection. Donors are screened for HIV and hepatitis B and C. HBIG is obtained from plasma sourced from outside the UK because of the small risk of vCJD and supplies are scarce and expensive.

HBIG provides passive immunity and can give immediate but temporary protection following known exposure to HBV (for example inoculation of blood from a known infected person through a needle stick injury). HBIG is given alongside the hepatitis B vaccine as the passive immunity only protects in the immediate period. The vaccine is given contemporaneously to develop and maintain long term active immunity.

Full details regarding administration, contraindications and precautions of both the hepatitis B vaccination and HBIG may be found in the Green Book[6].

Aim

To review current practice and evidence regarding the management of acute hepatitis infection and formulate guidance for health professionals, health protection teams and Public Health England (PHE) staff to aid in the prevention of hepatitis b virus transmission.

Method

In February 2018 a literature search was conducted to review evidence that may be pertinent to the guidance since the hepatitis B and C standards were published in 2011. An advanced search was conducted on health services databases incorporating AMED, BNI, CINAHL, EMBASE, HBE, HMIC, Medline, Pubmed and OVID.

The Cochrane library was also searched. Much of the evidence of current practice is already established within the Green Book and hepatitis B and C standards[5]. The standards were also reviewed. Some elements of current practice may not be evidence based and this was discussed at the PHE viral hepatitis leads group and consensus reached.

Strengths and limitations

A key strength of this guideline was that it was compiled with reference to the AGREE II tool[7]. This tool enables guidelines to be formulated in a systematic way using appropriate evidence. Unfortunately, a full literature search could not be recorded as this was done prior to the AGREE II tool being utilised and therefore was not documented in full at the time.

The guideline has undergone several iterations and has been agreed by a group of multidisciplinary experts in the field.

Notification and risk assessment

Viral hepatitis is a statutorily notifiable infectious disease i.e. the clinician suspecting the diagnosis is required to notify the proper officer of the local authority, usually the consultant in communicable disease control (CCDC). The statute does not offer guidance on the definition of viral hepatitis that should be notified nor whether the notification applies to acute cases, but hepatitis b virus is indicated as a causative organism that is required to be notified to PHE under the health protection regulations 2010[8]. Laboratories that diagnose cases should report data to the health protection teams at PHE and in the case of acute hepatitis B this should be phoned through both in and out of hours. This is to ensure a timely risk assessment can take place and prompt delivery of public health actions outlined in the guidance below.

For each notified case of acute hepatitis B, confirmation should be sought from the notifying clinician that this is an acute case, if there is any doubt a virology opinion should be sought and then a risk assessment undertaken and the national surveillance form available here completed: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/521639/IMW179_LAB_HEP_B_reporting_form_v3_Final.pdf

If available, training may be sought in sexual health history taking as this is potentially a sensitive subject but also important information to gather. Information should be sought regarding the 12 weeks prior to the infection being diagnosed.

The following information should be collected in each case.

Caller details, including:

- Name, address, designation and contact number

Demographics, including:

- date of birth, gender, ethnicity, birthplace, NHS number
- address including postcode, phone number
- occupation, place of work/education
- GP name and contact details (address and phone number)

Clinical details, including:

- symptoms and signs with onset and severity of symptoms including date of jaundice, if present
- Hospital admission, date of death if occurred
- Results of laboratory investigations (local and/or reference laboratory)
- Other medical conditions
- Medications

Risk Factors, including:

- vertical transmission (mother to child)
- household or family exposure
- any contact with case of hepatitis B
- inoculation injury
- injecting drug use in their lifetime
- drug use over the past 4 weeks – if injecting, sharing of needles or paraphernalia
- sexual contact with men
- sexual contact with women
- dialysis
- any recent surgery
- recent dental work
- receipt of a blood transfusion/blood products
- piercings or tattoos
- acupuncture
- cupping therapy or hijama (alternative medicine where suction created on skin and the skin is broken)
- therapeutic/prophylactic or cosmetic injections
- electrolysis
- whether transmission likely occurred in a custodial setting
- occupational exposure
- recent travel

Epidemiological details, including:

- immunisation history (including dates) and any immunoglobulin given
- history of previous hepatitis B infection

Other

- details of close contacts (including sexual contacts)

Rationale	Surveillance of acute infection can be used to monitor trends, to evaluate current immunisation programmes and to inform changes to national and local immunisation and control policy. By collecting information on exposure categories in those cases identified, the target groups for selective immunisation can be determined and the effectiveness of current programmes evaluated
Evidence grading	This is indicated on the basis of previous scientific observation and theoretical rationale, but case-controlled or prospective studies do not exist. There is however clear scientific rationale for the transmission routes outlined above

Roles and responsibilities

The laboratories, the health protection teams and the treating clinicians are responsible for surveillance and control measures including prevention of onward transmission and outbreak investigation. Consultant virologists are also well placed to offer advice regarding prevention of onward transmission. There are many people involved in the care of an individual who has been diagnosed with hepatitis B and therefore local arrangements should be in place in order to prevent duplication in actions for prevention and control. It is important that consistent messages are agreed across all professionals.

Key definitions

Diagnosis may be subdivided into possible, probable and confirmed based upon a combination of serological markers, clinical symptoms and avidity testing.

Possible Acute Case	HBsAg positive, but no clinical information
Probable Acute Case	HBsAg positive and clinical diagnosis as described at the beginning of this guidance **or** HBsAg positive and anti-HBc IgM positive; **or** A contact of a probable/confirmed case with clinical symptoms suggestive of acute hepatitis *anti-HBc IgM may be present in chronic infection in approximately 20% of cases
Confirmed Acute Case	HBsAg positive and anti-HBc IgM positive **and** clinical symptoms'/abnormal liver function tests **Or** avidity test consistent with acute viral hepatitis

Hepatitis B vaccine

Aim of immunisation is to provide a minimum of three doses (depending on vaccine and schedule used) of hepatitis B (HepB) vaccine for:

- infants, as part of the routine childhood immunisation programme, to protect against future exposure risks (pre-exposure immunisation)
- individuals at high risk of exposure to the virus or complications of the disease (pre-exposure immunisation) e.g. Health care workers, renal patients, people who inject drugs, prisoners, family contacts
- individuals who have already been exposed to the virus (post exposure immunisation) including infants born to hepatitis B infected mothers, recent sexual contacts of an acute case of hepatitis B

Monovalent, bivalent and hexavalent HepB vaccines are available in the U.K.

There are several pre-exposure schedules:

- 0, 1, 6 months (previous standard)
- 0, 1,2 and 12 months (more common standard/ accelerated)
- 0,7,21 days and 12 months (super accelerated)

Their use depends on how urgently protection is needed, likelihood of adherence, age, medical conditions and the vaccine used. The most common schedule used in adults and children is the 0,1, 2 and 12 months schedule. For full details of indications, vaccines and schedules please refer to the Green Book (https://www.gov.uk/government/publications/hepatitis-b-the-green-book-chapter-18).

Public Health Action (Diagram 1)

Possible case

If there is any uncertainty that this may be an acute case, then more information should be gathered about the case to determine if acute hepatitis B is the most likely diagnosis or if chronic hepatitis B is more likely based upon clinical features/information/further testing. If confident all acute cases are notified by phone this action should not be required.

Probable case/confirmed case

Once a case fits the criteria and becomes a probable or confirmed then public health actions should be taken to control and prevent further cases.
A risk assessment should be completed on all probable and confirmed cases to ascertain the possible transmission routes of the HBV as outlined above. This should give a clearer picture as to where it may be necessary to focus public health efforts. Any specific context should be entered onto HPZone so any linked cases can be identified.

The case should be counselled on the mode of transmission and preventative methods to stop onward transmission by the health protection team or the treating clinician. This should include information on protected sex, sharing needles and drug paraphernalia. Household hygiene should also be discussed such as sharing razors, toothbrushes and towels and this should be documented.

Identify close contacts. For the purpose of this guideline ‘close’ is a household or sexual contact of the case. There may also be certain special circumstances where contact with contaminated blood or blood products may require further public health action. Management of these issues is discussed later in this guidance.

All adult cases should be signposted to Genito-urinary medicine (GUM) clinic for a full sexual health screen. If the case is a child with an unknown mode of transmission, consider a safeguarding referral.

The GP should be informed of the diagnosis and be aware that the disease may progress to chronic hepatitis B and the sequelae that occur with that.
If the notification is from a GUM clinic and the health protection team are following up, consent should be sought prior to informing the GP of the diagnosis.

If the case is a healthcare worker liaise with local occupational health department after gaining consent from the case[9]. A discussion should take place with the healthcare worker about the need to inform their professional regulatory body.

If the case is pregnant or newly delivered liaise with local midwifery, screening or health visiting team to ensure appropriate follow up. Each locality will have their own care pathway and service for follow up[10]

For referrals from the NHS blood and transplant service it is important to discuss with NHSBT so as not to duplicate actions

Rationale for above actions	Acute hepatitis B resolves in the majority of individuals infected in adulthood. Further assessment of the infection status of all cases at 6 months will identify those who have become chronically infected and are therefore at risk of chronic liver disease.
Evidence	Indicated on the basis of previous scientific observation and theoretical rationale, but case-controlled or prospective studies do not exist.

Close contacts (Diagram 2)

Contacts may be divided into household contacts and sexual contacts.

All contacts should be immunised against Hepatitis B as soon as possible following exposure. Vaccination is effective in stimulating the production of antibodies against the virus and preventing infection if given shortly after exposure. Ideally, the immunisation protocol should begin within 24 hours of exposure although it should still be considered if later. If infection has already occurred at the time of immunisation, virus multiplication may not be inhibited completely but development of chronic hepatitis B may be prevented[6].

HBIG is used to give protection until the hepatitis B vaccination becomes effective. When necessary, HBIG should be given within 24 hours of exposure but may be considered up to 7 days post exposure[6]. This will only be given in certain circumstances and should be discussed with the local virologist, circumstances are outlined below.

Rationale	Post exposure prophylaxis with immunoglobulin for sexual contacts has been shown to reduce the risk of secondary cases. Based upon the use of post-exposure vaccination in other settings, vaccination and hepatitis B immunoglobulin (HBIG) is likely to be highly effective in this context.
Recommended on the basis of >1 well-conceived, well-executed, controlled, or time-series study; or >3 studies with more limited execution.	

Any sexual partner of individuals thought to have acute hepatitis B should be offered post exposure prophylaxis with the vaccine and if within one week of last unprotected sexual contact they should also be offered HBIG[6].

To avoid infection with HBV, they need to practice safe sex (including use of condoms) until the third dose is given[11].

They should also be offered testing for hepatitis B and referred to GUM for testing for other sexually transmitted infections.

Rationale	Sexual contact is a key transmission route and concurrent infection may occur. Referral to a GUM clinic is advised to rule out any other sexually transmitted infection.
Evidence	Indicated on the basis of previous scientific observation and theoretical rationale, but case-controlled or prospective studies do not exist.

Household contacts should be offered post exposure prophylaxis with the vaccine and they should be offered a test for hepatitis B. A further risk assessment should be conducted to ensure that no other actions such as providing HBIG are necessary[6].
In both of these circumstances it is important where possible to take blood for testing for the hepatitis B virus and give the first vaccination at the same appointment. This is to avoid delaying the vaccination whilst waiting for test results and difficulty in chasing up patients if they fail to attend a second appointment. In line with the green book no follow up testing for immunity is required.

Diagram 1: management by health protection teams of index case

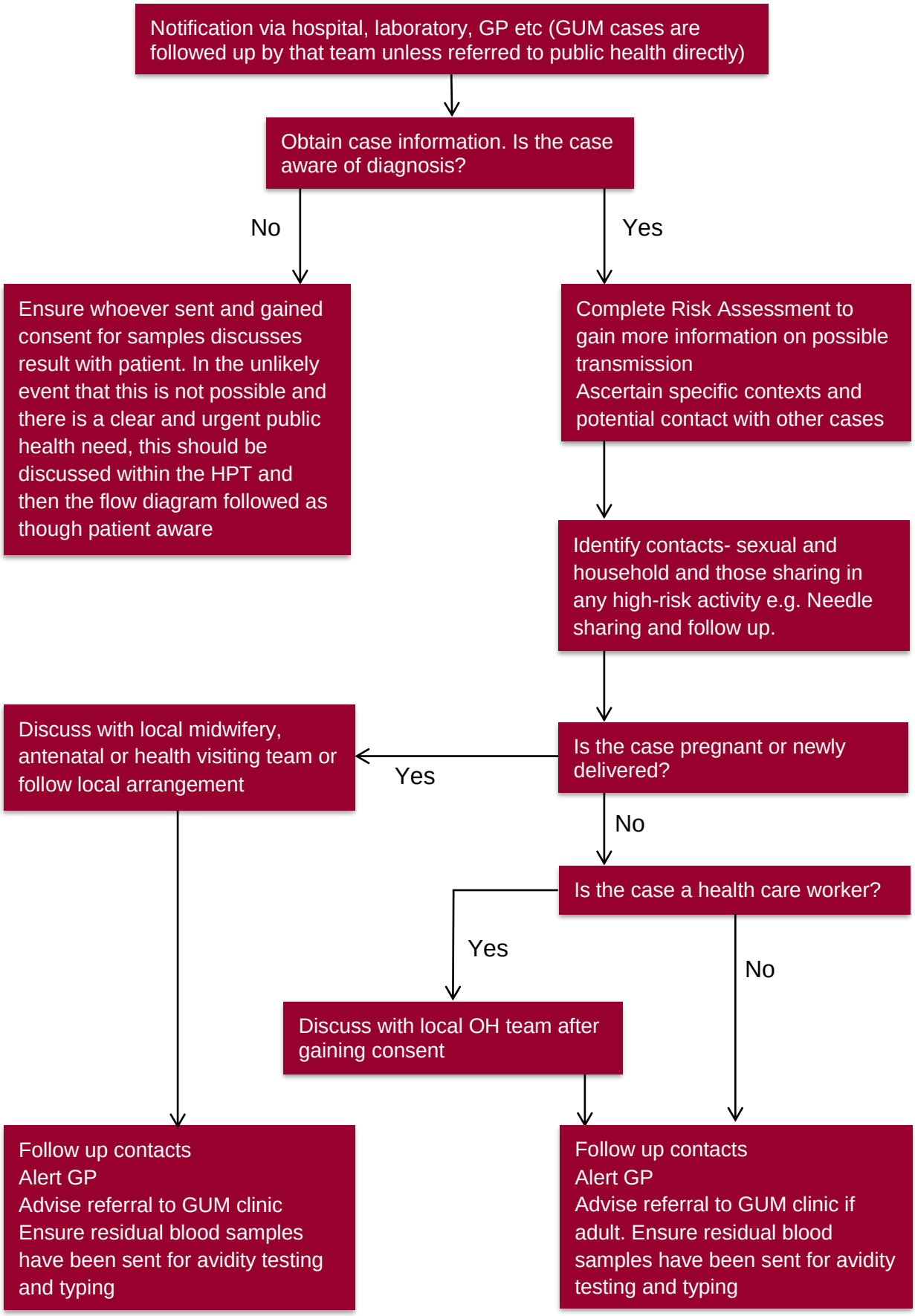
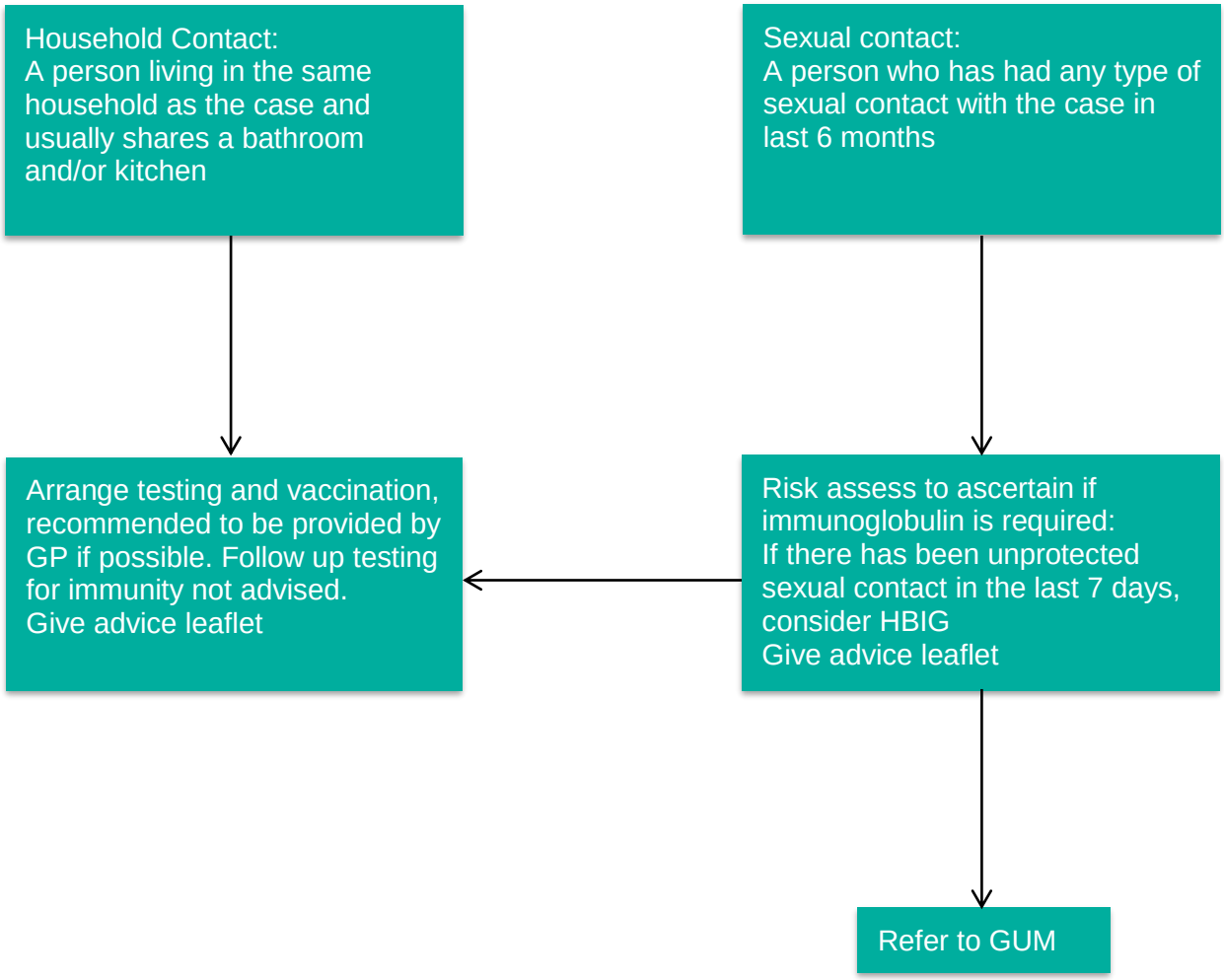


Diagram 2: management by health protection teams of contacts



Primary prevention

The hepatitis B vaccine has been part of the routine childhood immunisation programme since 2017. Pre-exposure immunisation is also recommended for individuals who are at an increased risk of hepatitis B or complications of the disease because of lifestyle, occupation, co-existing condition or other factors. More information can be found here in the green book about whom and how to immunise: https://www.gov.uk/government/publications/hepatitis-b-the-green-book-chapter-18

The main groups who should be offered pre-exposure vaccination are:

- people who inject drugs (PWID) – all current PWID and those who inject intermittently, those who are likely to progress to injecting and all sexual and household contacts of PWID
- individuals who change sexual partners frequently, male and female sex workers and men who have sex with men
- close family contacts of an individual with chronic hepatitis B infection
- families adopting children from countries with high or intermediate prevalence of hepatitis B
- foster carers
- individuals receiving regular blood or blood products and their carers
- patients with chronic renal failure – particularly those who require haemodialysis which may put them at an increased risk of hepatitis B
- patients with chronic liver disease
- inmates of custodial institutions
- individuals in residential accommodation for those with learning difficulties and staff
- travellers to areas of high or intermediate prevalence who may be at risk whilst abroad
- those with occupational risk: healthcare workers, laboratory staff and other potentially high-risk occupations such as morticians and embalmers and prison staff

Although immunisation in high risk groups is evidence-based to protect individuals from the transmission of hepatitis B, universal precautions remain of the upmost importance and should not be neglected[9121314151617].

In an institutional or health care setting, where individuals may be exposed to the blood or body fluids of others (for example, a care home where blood glucose is monitored), check that appropriate infection control procedures are in place and consider whether others may have been exposed or may be the source for the infection.

There is specific information for care homes surrounding blood glucose monitoring, the use of disposable and reusable lancing devices in order to prevent onward transmission of blood borne viruses of which hepatitis B is one of them.
This can be found here:
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/343534/Blood_Glucose_monitoring_guidelines_26_October_09__final_.pdf

Rationale	There is a wealth of evidence that currently examines the use of the hepatitis B vaccination. It currently suggests that the need for primary prevention in terms of vaccination is effective in the groups where risk of transmission is high.
Evidence	Recommended on the basis of >1 well-conceived, well-executed, controlled, or time-series study; or >3 studies with more limited execution.

Post Exposure

Secondary prevention best describes precautions taken following exposure or potential exposure to stop the person exposed being infected with hepatitis B. The risk of transmission depends on several factors, including:

- type of exposure
- the HBV status of the source (whether they are considered infectious or not, i.e. e antigen positive)
- the HBV status of the person exposed

Significant exposure is considered to be percutaneous (through skin puncture), mucocutaneous (contamination of non-intact skin, conjunctiva or mucous membranes) and sexual exposure (unprotected sexual contact).

The status of the source may be already known or determinable- such as a patient already admitted to hospital or may be unknown and not determinable in instances such as assaults or needle stick injuries from sharps boxes.

This information in conjunction with the status of the exposed person can then be used to decide upon the most appropriate prophylaxis for reported exposure incidents[17] (Table 1).

Table 1: Hepatitis B prophylaxis for reported exposure incidents [6]

	Significant Exposure			Non – significant exposure	
HBV status of person prior to exposure	HBsAg positive source	Unknown source	HBsAg negative source	Continued risk	No further risk
Unvaccinated	Accelerated course of HepB vaccine plus HBIG with first dose	Accelerated course of HepB vaccine	Consider course of HepB vaccine	Initiate course of HepB vaccine	No HBV prophylaxis Reassure
Partially Vaccinated	One dose of HepB vaccine and finish course	One dose of HepB vaccine and finish course	Complete course of HepB vaccine	Complete course of HepB vaccine	Complete course of HepB vaccine
Fully vaccinated with primary course	Booster dose of HepB vaccine if last dose ≥1 yr ago	Consider booster dose of HepB vaccine if last dose ≥1 yr ago	No HBV prophylaxis Reassure	No HBV prophylaxis Reassure	No HBV prophylaxis Reassure
Known non-responder to HepB vaccine (anti-HBs < 10mIU 1-2 months post immunisation	HBIG Booster dose of HepB vaccine A second dose of HBIG should be given at one month	HBIG Consider booster dose of HepB vaccine A second dose of HBIG should be given at one month	No HBIG Consider booster dose of HepB vaccine	No HBIG Consider booster dose of HepB vaccine	No HBV prophylaxis Reassure

Rationale	There is better evidence as to the use of immunisation for contacts of patients with acute hepatitis B than the immunoglobulin, however in certain circumstances the evidence suggests that the immunoglobulin will have a protective effect until immunity from the vaccine has been conveyed. Hepatitis B immunoglobulin is superior to normal human immunoglobulin in preventing transmission of hepatitis B. The use of immunoglobulin for short term immunity has been shown to be effective in preventing vertical transmission and in cases where there has been significant exposure to person who is hepatitis B surface antigen positive.
Evidence	Recommended on the basis of >1 well-conceived, well-executed, controlled, or time-series study; or >3 studies with more limited execution.

Specific circumstances

Babies born to hepatitis B infected mothers – post exposure management

Perinatal transmission of HBV can occur around the time of birth. When transmission does occur this way, there is a high risk of babies becoming chronically infected with HBV. For this reason, it is important that the appropriate vaccination is commenced immediately after birth. As transmission can be reduced in this way, testing the pregnant woman for hepatitis B is part of the Infectious Disease in Pregnancy Screening Programme (IDPS). This enables pregnant women to be appropriately screened, identified as being infected with HBV and then treated. It also allows an appropriate birth plan to be arranged including prompt vaccination and administration of HBIG if appropriate to reduce transmission to the baby.

If a mother is shown to be highly infectious or the baby is born preterm weighing less than 1500g then HBIG should also be considered as well as vaccination. Further information can be found in chapter 18 of the Green Book and in the NHS hepatitis B pathways to protection guidance for antenatal and postnatal care

PHE recommends that here should be no delay in giving hepatitis B vaccine to babies born to hepatitis B mothers[181920].

If hepatitis B monovalent paediatric vaccine is not available alternative hepatitis B containing vaccines – including adult and combination vaccines - can be given safely.

If practitioners cannot order paediatric monovalent vaccine for a baby due a dose immediately, the HPT MUST liaise with SILs to order alternative vaccine to ensure the baby can be vaccinated on time. More information can be found here: https://www.gov.uk/government/publications/hepatitis-b-vaccine-for-at-risk-infants-aide-memoire

Rationale	Perinatal transmission carries the highest risk of acquiring chronic hepatitis B of any mode of transmission. Studies show a significant decrease in vertical transmission when HBIG is given alongside hepatitis B vaccination post-delivery.
Evidence	Recommended on the basis of >1 well-conceived, well-executed, controlled, or time-series study; or >3 studies with more limited execution.

There is currently not enough evidence to suggest that giving HBIG to the mother in the antenatal period would alter outcomes, so this is not currently recommended but more research is ongoing[20].

Multi-occupancy households

There have been some reported cases of acute hepatitis B in households where other members share cooking and bathroom facilities but are not related. In some circumstances, occupants may know each other- such as halls of residences but in other circumstances they may not. The case should be dealt with as above but in terms of informing contacts, this should be done on a case by case basis.

A letter may be found in the appendices of this document to aid in providing information if is so required.

Nosocomial infection

If it is determined that there has been possible or probable nosocomial transmission of HBV there should be a full risk assessment undertaken and discussions undertaken with the consultant virologist and Director of Infection Prevention and Control.

An incident meeting should be convened in order to fully investigate the route of transmission. Further contact tracing may need to occur if there is suspected transmission from a healthcare worker or in a dialysis unit.

Safeguarding issues

There may be certain circumstances where a child or vulnerable adult is diagnosed with acute hepatitis B. In the event of this occurring the route of transmission should be fully investigated. In the event of the transmission route not being identified or there being cause for concern, this should be discussed as part of the wider multidisciplinary team with the safeguarding lead and a clear plan formulated and documented. Any safeguarding issues should be documented under the context ‘safeguarding’ on HP zone.

It is not the responsibility of public health teams to investigate any safeguarding issues, but any suspicion should be reported to the relevant authorities to investigate properly. For children this is the local authority children’s safeguarding team and for adults the local authority adult safeguarding team.

The local PHE safeguarding lead should be informed and update any relevant local records.

Outbreaks

Specific examples of clusters include those incidents outlined below.

Transmission within a healthcare setting including care homes

There is current guidance for care homes with diabetic residents to prevent hepatitis B transmission but if this occurs an outbreak control team (OCT) should be convened[12].

Transmission within a non-healthcare setting

suggestive of breaches of infection control procedures including tattoo parlours and intradermal injections in beauty salons.

Transmission in men who did not identify as gay but later revealed MSM activity at sex on site venues

A cluster of acute hepatitis B cases was identified in 2016 in the UK of men married to women who initially denied any sexual encounters with any other men. On further interview they disclosed having regular anonymous sex at a cruising site. Specific health promotion and preventative strategies were then implemented at the cruising site to reduce further transmission[21]

Any specific contexts should be documented in the surveillance forms. Samples should also be sent to BBVU (Blood Borne Virus Unit) at Colindale for confirmation and typing to allow for better identification of outbreaks. All acute hepatitis B cases should be assigned to the acute hepatitis B context in HPZone. Local increases in acute hepatitis B cases should be reported and investigated for common epidemiological and microbiological links including genotyping and sequencing. There is an enhanced questionnaire to be completed in any cases that are thought to be part of a cluster or outbreak, this may be found here: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/521640/AcuteHepB_EnhancedSurveillanceForm_v2.pdf

If there is a confirmed outbreak, then an OCT should be convened with relevant stakeholders. For details of membership and actions of an outbreak control team, please refer to the Communicable Disease Outbreak Management Operational guidance that can be found here: https://www.gov.uk/government/publications/communicable-disease-outbreak-management-operational-guidance

In the event of a suspected outbreak or cluster the following people should be considered to be part of the OCT, such as:

- local health protection team
- local microbiologist/virologist
- local authority
- commissioners and/or providers (such as Clinical Commissioning Group representative, NHS England)
- representatives as appropriate from the implicated institutions, depending upon the setting (for example, care home managers, prison representative)
- PHE National Infection Service – Virus Reference Department senior scientist / consultant virologist
- PHE National Infection Service – Immunisation, Hepatitis and Blood Safety Department senior scientist/consultant epidemiologist
- communications department

Support and advice can be sought from Colindale Blood Borne Virus Unit and Immunisation and Hepatitis Department.

Appendix 1: sample standard operating procedure (SOP) – to be edited locally

Clinical guideline
TITLE: Acute Hepatitis B

Review Date:
Version:

AUDIENCE (who is it for)

- Acute response staff
- Health Protection Teams
- virologists
- Laboratory Staff
- Field Service

RATIONALE

To provide guidance on the public health management of acute hepatitis B to prevent onward transmission

BACKGROUND TO INFECTION

- Incubation period: the incubation period from infection to the appearance of symptoms is around 12 weeks (range 40 to 160 days)
- Transmission mode: transmitted through blood and bodily fluids – transmission may occur through sexual contact, blood-to-blood contact through percutaneous exposure and perinatal transmission from mother to child
- Infectious period: a person is infectious for the duration of illness whilst HBsAg (the surface antigen) remains present – appropriate infection prevention methods should be employed whilst the patient remains infectious

ACTIONS TO BE TAKEN ASAP

1. Obtain case information: name, address, dob, NHS number, phone number, GP, current location: home or hospital, ethnicity & country of birth
2. Ascertain who has requested the lab test – GP/hospital/drugs team and if case has been informed of the diagnosis
3. Conduct risk assessment

4. Ascertain possible sources of exposure. For examples contact with known cases, by sex, peri-natally, by healthcare procedures, by other bloodborne routes i.e. tattoo, acquired abroad, or in an institution e.g. prison. Record on HPZone under “Hep B risk factors / transmission”.
5. Ascertain whether others are at risk from this case or co-exposure
6. Discuss with GP/clinician or directly with case any sexual or other contacts. They may require post-exposure vaccination and hepatitis B immunoglobulin. Discuss with local virologist.
7. If case is pregnant discuss with relevant SIL team to ensure they are aware of case as testing may be outside of the routine antenatal programme. This can be done the next working day.

CASE DEFINITION (IF APPLICABLE)

Confirmed
HBsAg positive and anti-HBc IgM positive **and** clinical symptoms’/abnormal liver function tests
Or avidity test consistent with acute viral hepatitis

Probable
HBsAg positive and clinical diagnosis **or**
HBsAg positive and anti-HBc IgM positive; **or**
A contact of a probable/confirmed case with clinical symptoms suggestive of acute hepatitis

Possible / Unlikely
HBsAg positive, but no clinical information

NATIONAL GUIDANCE

- Links to national guidance:

DOCUMENTATION ON HPZONE - (HPZone actions, contexts)

- Ascertain clinical features and record on HPZone under *“Hep B clinical features”*;
- record lab features under *“Hep B markers”.*
- Add relevant contexts to HPZone

FOLLOW ON ACTIONS

1. Alert duty CCDC to linked or hospitalised cases.
2. Check whether any lab investigations have been taken, record on HPZone.
3. Ensure contacts have been followed up
4. Send out advice letter and information sheet to GP for them to share with the case
5. Fill out surveillance questionnaire
6. Ask lab to ensure residual blood samples from case have been sent to CFI for avidity testing and typing.
7. Re-assign diagnosis as chronic if tests fail to confirm as acute.

COMMUNICATIONS

- Internal HPT communications, handover –review for new cases.
- Media – comms/press statements for confirmed clusters discuss with duty CCDC.
- Public information – letters/factsheets confirmed cases only, discuss with duty CCDC.

FURTHER FOLLOW UP (as relevant) –

Not routinely required for probable/possible cases.

- Inform FES of any confirmed or highly likely cases at the weekly FS/HPT meeting.
- For clusters and outbreaks inform FS colleagues ASAP.
- Consideration of incident meeting.

CHECKLIST

Not required above what is contained in this guideline

AUDITABLE STANDARDS

- HPZone documentation
- Risk Assessment undertaken within 24 hours
- Correct HPZone classification

Ratified at the local Health protection management meeting on:

Appendix 2: sample letter to send to GPs

Public Health England

Public Health England
T +
F +

Include health protection address and phone numbers

www.gov.uk/phe

Our Ref:
CONFIDENTIAL

Dear Colleague,

I have been notified that your patient has some results suggestive of acute Hepatitis B infection. In line with current guidance please be advised of the following:

Public Health England recommends the following actions are undertaken in relation to the patient:

- Refer for assessment by a hepatologist or consultant gastroenterologist if not currently under this team
- Provide the patient with the relevant information leaflet on hepatitis B
- Please advise referral to GUM
- Advise on avoidance of other hepato-toxic exposures, including alcohol.
- Your patient should be given Influenza and Pneumococcal inactivated vaccines. If your patient is at ongoing risk of chronic liver disease, they may benefit from vaccination against hepatitis A
- Advise that any new sexual partners will be at risk of infection. Safer sexual practice should be encouraged until 3 doses of vaccine have been given and a forth dose is planned
- Advise the patient that household (family including children) and sexual contacts, should be offered screening and vaccination.
- If your patient is a health care worker, please also refer them to their occupational health department once consent has been obtained.

If the patient is pregnant, please also inform the antenatal screening co-ordinator. As per current national policy her baby will require hepatitis B vaccination once born.
DELETE IF MALE

Management of Contacts

Patients should be advised that they need to inform sexual, needle sharing and household contacts about their infection.

Vulnerable patients may need extra support to inform contacts. The local GUM clinic may be able to support confidential contact tracing of sexual contacts.

Screening and vaccination of contacts:

- Sexual contacts should be tested for hepatitis B markers and given the first dose of hepatitis B vaccine at the same time. Immunoglobulin may be offered if unprotected sexual contact occurred in the last 7 days, please contact the Health Protection Team to discuss.

- Household contacts: give the first dose of hepatitis B vaccine and take blood sample for Hep B screening (i.e. HBsAg) - ideally at the same/first visit.

- Contacts that are HBsAg positive, indicating infection, should be notified as a case to the Health Protection Team and referred to a hepatologist/gastroenterologist. When notifying please state that this is a contact of a notified case.

- Contacts demonstrating immunity (i.e. HBsAg negative, anti-HBs and/or anti-HBc positive) do not require further immunisation.

- For all other contacts a further 2 doses of the vaccine should be given at monthly intervals, with a booster dose at one year

Our advice is based on nationally agreed guidance and almost all individuals can be safely vaccinated with all vaccines. If you have any questions, please contact us on xxxxx. Please be aware it is the responsibility of the provider to ensure the recommendations suit the individual patient.

Yours sincerely,

Appendix 3: sample patient information leaflet

Public Health England

ADVICE AND INFORMATION
ABOUT
HEPATITIS B INFECTION

What is hepatitis?
Hepatitis means inflammation of the liver. The commonest cause is infection with a virus, but hepatitis can also be caused by drinking too much alcohol or by the side effects of some drugs and chemicals.
There are several different hepatitis viruses which affect the liver, the main ones are hepatitis A, B, C, D and E. The viruses differ from each other in how they are spread, the way they cause liver damage and the effects they can have on your health. This leaflet is about hepatitis B virus (HBV).

What are the symptoms of hepatitis B?
There is a time, known as the incubation period, of between 6 weeks and 6 months after the virus enters the body before any symptoms may appear. Many people never have any symptoms. Some adults notice a short 'flu-like' illness which may include tiredness, aches and pains, nausea and loss of appetite. These symptoms are sometimes diagnosed as 'flu' unless more serious symptoms such as vomiting, abdominal pain and yellow jaundice occur. Jaundice causes the skin and whites of the eyes to go a yellow colour.

Acute and chronic hepatitis B
Hepatitis B can cause an acute or a chronic illness.

- An **acute** illness is one that gets better quickly, usually within weeks or at most a few months.
- A **chronic** illness is one that lasts a long time, possibly for the rest of life, sometimes waxing and waning. Chronic hepatitis B is hepatitis B that has lasted longer than 6 months.

Most adults recover fully from acute hepatitis B normally within 6 months and remain immune for life. Some people may be ill for days or weeks and then recover. Others may recover without realising they have been infected.
On rare occasions an acute infection causes fatal liver damage.
A few people carry the virus without symptoms. They are known as chronic hepatitis B cases and maybe unaware that they are infected. Some chronic hepatitis B cases develop liver disease while others remain healthy. Most chronic hepatitis B cases are infectious (i.e. capable of spreading the virus to others) although the degree of infectiousness ranges from very low to very high. Some chronic hepatitis B cases clear the virus after varying intervals. Approximately

25% of chronic hepatitis B cases develop serious liver disease, including continuing hepatitis, cirrhosis and, over time, some develop liver cancer.

How do you catch hepatitis B?
In this country, in Europe and in North America hepatitis B is mainly passed from person-to-person sexually; although worldwide the main route of transmission infected blood, particularly when babies are born to infected mothers. The virus may be present in other secretions such as saliva and vaginal fluid which may transmit the infection.

Blood
A tiny amount of blood, too small to be visible to the naked eye, from someone who has the virus will transmit the infection if it gets into someone else's bloodstream. This can happen through an open wound, cut or scratch, or from a contaminated needle. Injecting drug users who share injecting equipment have a high risk of infection. The virus can also be passed on from medical and dental treatment in countries where equipment is not adequately sterilised. All blood donated in the UK is now screened for hepatitis B, but before screening it was possible to become infected by receiving blood or blood products from an infected person. In countries where blood is not screened, blood transfusions may still be a cause of infection.

Sex
Hepatitis B can be passed on during unprotected sex with an infected person.

Mother to baby
Infected mothers can pass on the virus to their babies around the time of the birth. Babies infected at birth are very likely to develop chronic infection unless they are vaccinated. Vaccination of babies born to hepatitis B positive mothers at birth is extremely effective at preventing infection. Since April 2000 a pregnant woman have been offered testing for hepatitis B. If they are infected their baby will be vaccinated and may be given immunoglobulin immediately after the birth. Immunoglobulin contains active agents known as antibodies that given extra short-term protection against infection.

Treatment
Most people with acute hepatitis B do not need treatment as they do not develop long term liver damage. They may feel more tired than usual and need rest, but they eventually recover and acquire lifelong protection against the virus. A blood test should be done 6 months after the diagnosis of acute hepatitis B.

People who are infected for longer than 6 months may benefit from treatment. They need to be regularly monitored by a specialist in liver diseases to detect whether liver damage is occurring and whether treatment is necessary. Several antiviral drugs are currently being used for treatment.

Family and friends
Sexual partners, children and other household members of an acutely infected person or a chronic hepatitis B case should be vaccinated. Anyone who has shared needles with an acutely infected person or a chronic hepatitis B case should also be vaccinated. Advice on protection of close contacts can be obtained from your general Practitioner or local Health Protection Unit. There is no risk of infection from social contact so occasional visitors and friends do not need protection. For example, you cannot catch hepatitis B from a toilet seat or just by touching an infected person. No special precautions are needed when handling

crockery and cutlery used by someone with Hepatitis B. They can be washed up in hot soapy water or a dishwasher in the normal way.

Hepatitis B vaccine
For pre-exposure prophylaxis Hepatitis B vaccine is given by injection as 3 separate doses. When there is no immediate risk of infection the first dose is followed by one, one month later and another 5 months after that. The vaccine is given routinely to those who are at risk of becoming infected, for example, doctors, nurses and dentists who are at risk during the course of their work, babies born to infected mothers and contacts of acute or chronic cases of hepatitis B.

For individuals in high risk groups or where there has been an exposure to possible hepatitis B with an immediate risk of infection, then a faster vaccination course is given, with 3 doses each one month apart, plus a fourth dose after a year. A blood test is sometimes recommended before or at the same time as vaccination and again after the final infection to find out whether the vaccine has been effective

Engerix B® can also be given at a very rapid schedule with 3 doses given at zero, 7 and 21 days with a fourth dose at 12 months. This schedule is licensed for use in circumstances where adults over 18 years of age are at immediate risk and where a more rapid induction of protection is required.

The vaccine is given routinely to those who are at risk of getting infected, for example doctors, nurses and contacts of acute or chronic cases of hepatitis B.

How someone with hepatitis B can reduce the risk of infecting others:
- Carefully clean and cover cuts, scratches and open wounds with a waterproof plaster
- Clean up blood from floors and work surfaces and undiluted household bleach;
- Do not use anyone else’s toothbrush, scissors or other personal item;
- If having sex, practice safer sex by using a condom.
- Do not donate blood or semen or register as an organ donor.

Hepatitis B can be prevented by:
- Being vaccinated if you are at risk of getting infection e.g. healthcare workers, injecting drug users, contacts of acute or chronic cases;
- Not sharing needles if you are a drug user;
- Having a blood test for hepatitis B if you are pregnant and, if you are hepatitis B positive, by making sure your baby has the full course of vaccination;
- Using condoms if you are having sex with someone other than a steady partner;
- Not sharing items such as razors or toothbrushes that might have blood on them;

Considering the risks of tattooing or body piercing (not all tattoo artists/piercers follow good health practices) and other alternative therapies that may use sharp instruments or bloodletting practices.

Appendix 4: sample letter for multi-occupancy households

@phe.gov.uk
www.gov.uk/phe

Date

To whom it may concern.

Re: HPZ Reference

I am writing to inform you that you may have had a significant exposure to a person with Acute Hepatitis B infection in the past few weeks.

It is important that you attend your local GP practice or a Sexual Health clinic, (your nearest clinic can be found on www.nhs.uk), for a vaccination and blood tests.

Please also see attached factsheet for this Acute Hepatitis B which contains more detailed information on the virus and its symptoms.

Please contact the xxxxxx Health Protection Team on the above number if you require further advice or assistance.

Yours sincerely,

Public Health England
Email:

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