East of England Neonatal ODN
(Hosted by Cambridge University Hospitals)

Clinical Guideline: Management of babies born to mothers who are Hepatitis B positive

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For use in: EoE Neonatal Units
Guidance specific to the care of neonatal patients.

Used by: All neonatal/paediatric medical & nursing staff

Key Words: Hepatitis B, vaccination, immunoglobulin, intravenous drug abuse

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Approved by:

Neonatal Clinical Oversight Group	
Clinical Lead Matthew James	**Matthew James**

Ratified by ODN Board:

Date of meeting	**12th June 2024**

Audit Standards:

Audit points

1. **All infants born to mothers with Hepatitis B infection should have a postnatal plan made antenatally and checklist completed**
2. **All those considered high risk should receive Hepatitis B Immunoglobulin as well as vaccination at birth with a neonatal 'hep B dried blood spot' taken prior to vaccination**
3. **Those at high risk where a family member (not mother) is Hepatitis B positive or infants of intravenous drug users should receive a monovalent dose of Hepatitis B vaccine prior to discharge from hospital**

Introduction

Infants born to Hepatitis B virus (HBV) infected mothers are at high risk of acquiring HBV infection themselves at or around the time of birth (perinatal transmission), particularly if the mother has a high level of HBV DNA and hepatitis B e antigen (HBeAg) in her plasma. Without intervention the risk of transmission from an HBeAg seropositive mother is 70-90% compared with the risk of about 10% from an HBeAg negative mother. Infants who acquire infection perinatally have a high risk of becoming chronically infected with the virus. The development of chronic infection after perinatal transmission can be prevented in over 90% of cases by appropriate vaccination starting at birth of all infants born to infected mothers.
UK guidelines recommend that all pregnant women should be offered screening for Hepatitis B infection during each pregnancy. Where an un-booked mother presents in labour, an urgent Hepatitis B surface antigen (HBsAg) test should be performed to ensure that vaccine can be given to babies born to positive mothers within 24 hours of birth.

Antenatal Management

Refer to obstetric guideline.

Post Exposure Prophylaxis

There has been a universal Hepatitis B vaccination program in the UK since late 2017.
However, all infants born to HBsAg seropositive mothers should receive vaccination with the monovalent Hepatitis B vaccine at birth and 4 weeks. . The routine vaccination schedule then ensures they get given further doses of Hepatits B (hexavalent) at 8, 12 and 16 weeks. They then need a further Hepatitis B vaccination (monovalent) at 12 months. In total they will receive 6 doses of Hepatitis B vaccine. This aims to ensure immunity and prevent mother to child transmission.
For those infants who are at high risk (see below), they should receive 200-250 units Hepatitis B Immunoglobulin (HBIG) in addition to vaccination as soon as possible after birth and ideally within 24 hours of birth (please see section on Hepatitis B Immunoglobulin dosage below). If an infant is later identified as having missed HBIG at birth despite being eligible, HBIG can be given up to 7 days after birth.

Close Family Contacts of an individual with chronic Hepatitis B infection

Newborn infants born to a hepatitis B negative woman but known to be going home to a household with another hepatitis B infected person may be at immediate risk of hepatitis B infection. In these situations, a monovalent dose of hepatitis B vaccine should be offered before discharge from hospital. They should then continue on the routine childhood schedule commencing at 8 weeks.

Infants born to Intravenous Drug users

A monovalent dose of Hepatitis B vaccine should be offered before discharge from hospital. They should then continue on the routine childhood schedule commencing at 8 weeks.

Premature and low birth weight infants (less than 1500 grams)

The early response to hepatitis B vaccination is known to be lower in babies born prematurely so they should receive the full paediatric doses of hepatitis B vaccines on schedule
Babies born to women with hepatitis B infection, who have a very low birthweight (VLBW) of 1500g or less, should receive HBIG in addition to the vaccine, regardless of the e-antigen status or viral load of the mother. As the benefit of vaccination is high in this group of infants, vaccination should not be withheld or delayed. Split doses of HBIG can be given in neonates with VLBW. They should be prescribed 250 units (half the vial*) where 500 unit vials are available or alternatively the full vial if it is a 200 unit vial but may receive it in divided doses within the first 7 days of life.
Ideally HBIG should be given at the same time as Hep B vaccine, preferably within 24 hours and ideally within 48 hours after the vaccine

High Risk Infants

Infants are considered high risk if maternal antenatal serology indicates:

- HBsAg positive and HBeAg positive
- HBsAg positive, HBeAg negative and anti-HBe negative
- Mother had acute hepatitis B during pregnancy
- Mother is HBsAg positive and known to have an HBV DNA level equal or above $1x10^6$IUs/ml in any antenatal sample during this pregnancy (regardless of HBeAg and anti-HBe status)
- Mother is HBsAg positive regardless of e-antigen status or HBV DNA and baby weighs 1500g or less

All of the above infants should receive HBIG and hepatitis B vaccination. **Take a neonatal hepatitis B dried blood spot (DBS) prior to vaccination.**
See appendix 1 and 4

Low Risk Infants

Infants are considered low risk if maternal antenatal serology indicates:

- HBsAg positive and anti-HBe positive

These infants should receive hepatitis B vaccination

Vaccination Dosage and Schedule

TAKE CARE WITH BRAND OF HEPATITIS B VACCINE AS DOSAGE VARIES WITH BRAND
Engerix B® (monovalent) 10 micrograms (0.5ml) by intramuscular injection in anterolateral thigh, given at birth, 4 weeks and 12 months of age (where applicable).
HBVaxPRO® (monovalent) 5 micrograms (0.5ml) by intramuscular injection in anterolateral thigh, given at birth, 4 weeks and 12 months of age (where applicable)
Give low birth weight and preterm babies the full neonatal dose.
Infanrix hexa® (hexavalent) 0.5ml by intramuscular injection in anterolateral thigh given at 8, 12 and 16 weeks.
See appendix 2.

Hepatitis B Immunoglobulin Dosage

200-250 units** (half the vial*) by intramuscular injection in anterolateral thigh (in contralateral thigh to Hepatitis B vaccine injection site). The maximum intramuscular volume that should be administered to a new born is 1ml so this may need to be given in 2 divided doses.

**200 - 250 IU is to allow for the fact that 200 IU vials may soon become available again, in addition to 500 IU vials
*The volume of the 500 units vial varies hence give half the vial

Vials of “named baby” HBIG that are issued by the Health Protection Agency (Colindale) will be delivered to the hospital pharmacy department 7 weeks before the estimated date of delivery. The named baby HepB delivery suite box containing the birth notification paperwork will be issued to the hospital for the attention of the Antenatal Screening Coordinator/team.
The screening coordinator is responsible for “matching up” the named baby HBIG vial from pharmacy with the named baby HepB delivery suite box and ensuring that these are stored securely according to local arrangements so that they are available 24/7 to the delivery team for that named baby.

Check if baby has already had immunoglobulin ordered and on site (in delivery suite fridge). Mothers who have high-risk hepatitis B will have had immunoglobulin ordered at 32/40.

If no HBIG is available, during office hours contact the antenatal screening team who should be able to arrange an urgent order of HBIG.
If out of hours, phone the PHE National Infection Service Colindale Duty Doctor on 020 8200 4400 and request emergency issue of immunoglobulin. If requested to, fill in request form (appendix 3), scan and email to phe.hepatitisbbabies@nhs.net. They should be able to supply this within 5 hours.

Immunoglobulin (HBIG) should ideally be given within 24hrs of birth but is still beneficial if given up to 7 days after.
Hep B vaccine should not be delayed if waiting for HBIG as this provides majority of the protection.

The form that accompanies the vial should be completed by the administering doctor and forwarded to Public Health England (PHE).

Give low birth weight and preterm babies the full neonatal dose of 200-250 units, which they may receive in divided doses within the first 7 days of life.

Breastfeeding

Breast-feeding should be encouraged and supported. There is no contraindication to breastfeeding when a baby born to a mother who is Hepatitis B positive begins immunisation. Mothers, however, should not donate their milk.

Subsequent Management

All infants receiving Hepatitis B vaccination and HBIG (if indicated) should have the Hepatitis B vaccination documented in the appropriate place according to local practice and checklist completed (See appendix 4). Parents should be made aware of the treatment and be provided with information in a timely manner. They should be given the opportunity to ask questions. Please provide them with the Hepatitis B: A guide to your care in pregnancy and after your baby is born (publishing.service.gov.uk) and Protecting your baby against hepatitis B (publishing.service.gov.uk) leaflets.
A letter should also be sent to the GP and Child Health Department informing them of the increased risk of vertical transmission of Hepatitis B. The GP or Child Health Department should also arrange further appointments to complete the vaccination course and organise for a DBS sample to be done at the same time as the fourth dose is given to check if transmission has occurred (see appendix 5). This process is offered and monitored by PHE.
For those infants where prophylaxis has not been successful and who have become chronically infected, they should be referred for assessment and further management to a paediatrician with a special interest in paediatric infectious diseases who should arrange on-going follow up in outpatient clinic, as well as referral to a tertiary paediatric hepatology team.

References

1. Hepatitis B Guidance gov.uk website – updated January 2021: Guidance on the hepatitis B antenatal screening and selective neonatal immunisation pathway - GOV.UK (www.gov.uk)

2. Green Book chapter 18 “Immunisation against Infectious disease: the Green Book”. Last updated April 2024: The Green Book on Immunisation - Chapter 18 Hepatitis B (publishing.service.gov.uk)

3. Hepatits B maternal and neonatal checklist – updated April 2021: Hepatitis B maternal and neonatal checklist - GOV.UK (www.gov.uk)

4. Hepatitis B Immunoglobulin request form Hepatitis B Immunoglobulin request form: For infants at high risk of perinatal hepatitis B infection (publishing.service.gov.uk)

5. Hepatitis B immunoglobulin (issued November 2023) – updated February 2024 https://www.gov.uk/government/publications/immunoglobulin-when-to-use/hepatitis-b-immunoglobulin-issued-march-2021

Appendix 1 Summary of Immediate Postnatal Treatment of Infants born to Hepatitis B positive Mothers

Maternal Status	Vaccine required Engerix B® 10 micrograms i.m.	HBIG required 200-250 units i.m.
HBsAg positive and HBeAg positive	Yes	Yes
HBsAg positive, HBeAg negative and anti-HBe negative	Yes	Yes
Mother had acute hepatitis B during pregnancy	Yes	Yes
Mother is HBsAg positive and anti-HBe positive	Yes	No
Mother is HBsAg positive and known to have an HBV DNA level equal or above $1x10^6$IUs/ml in any antenatal sample during this pregnancy (regardless of HBeAg and anti-HBe status)	Yes	Yes
Mother is HBsAg positive and baby weighs 1500g or less	Yes	Yes

Appendix 2 Hepatitis B immunisation schedule for routine childhood and selective neonatal immunisation programmes following the introduction of hexavalent hepatitis B-containing vaccine

Age	**Routine Childhood Programme**	**Babies born to hepatitis B infected mothers**	**Babies born into household with close family contact of Hepatitis B infection or intravenous drug user**
Birth	**x**	Monovalent HepB	Monovalent HepB
4 weeks	**x**	Monovalent HepB	x
8 weeks	√	DTaP/IPV/Hib/HepB	DTaP/IPV/Hib/HepB
12 weeks	√	DTaP/IPV/Hib/HepB	DTaP/IPV/Hib/HepB
16 weeks	√	DTaP/IPV/Hib/HepB	DTaP/IPV/Hib/HepB
1 year	**x**	Monovalent HepB Test for HBsAg	x

Appendix 3 Request form for HBIG

UK Health Security Agency

Hepatitis B Immunoglobulin request form

For infants at high risk of perinatal hepatitis B infection

IMPORTANT: please write clearly in dark ink and complete all fields below to avoid delays in processing.

Antenatal patient details

Mother's surname:

First name:

Date of birth:

NHS number | | | | | | | | | | |

Booking blood sample number:

Requesting hospital:

Home address:

GP name and address:

Ethnic group

☐ White British ☐ White Irish ☐ White Other
☐ Black African ☐ Black Caribbean ☐ Black Other
☐ Indian ☐ Pakistani ☐ Bangladeshi
☐ Chinese ☐ Asian other ☐ Mixed

Other:

Country of birth:

Has the mother been referred to specialist care for her hepatitis B?

☐ Yes ☐ No ☐ Unknown

Hospital:

Indication for HBIG: women with higher infectivity

Acute hepatitis B in pregnancy?	☐ Yes	☐ No	
HBsAg	☐ Positive	☐ Negative	☐ Unknown
HBeAg	☐ Positive	☐ Negative	☐ Unknown
Anti-HBe	☐ Positive	☐ Negative	☐ Unknown

Viral load _____ iu/ml

Immunoglobulin is indicated for INFANTS of women with higher infectivity risk, i.e:

Pregnant women with acute hepatitis B **OR:**
Pregnant women who are HBsAg positive **AND:**

- HBeAg positive **OR**
- Anti-HBe negative **OR**
- E-markers unknown **OR**
- HBV DNA ≥ 1 x 10^6 IU/ml, **OR**
- Birth weight of their newborn is ≤1500g

Current state of pregnancy

☐ Expected ☐ Delivered | Est. delivery date: | ☐ Multiple birth (please complete a separate form for each sibling)

HBIG ISSUE

For routine issues, this HBIG request will prompt the dispatch of the HepB delivery suite box to the antenatal screening team and a vial of HBIG for the named baby to your pharmacy 6-8 weeks prior to the EDD (during normal office hours). The HBIG vial will have instructions for the pharmacist to contact the Antenatal Screening Team on receipt of the vial in order to link the vial and the box.

Please provide name of the ASC or equivalent person responsible for storing HBIG (if not at pharmacy)

Antenatal Screening Coordinator:

Telephone number:

Coordinator address for HepB delivery suite box:

Form completed by:

Contact number:

Date:

Signature of GMC registered medical practitioner (required by MHRA):

Name of GMC doctor:

GMC no.: Date:

Please send completed form via email to: **phe.hepatitisbbabies@nhs.net** from **@nhs.net** email address only

EMERGENCY HBIG ISSUE

During office hours: call **0330 1281020 option 2** and email request to: **phe.hepatitisbbabies@nhs.net**
Out of hours: call **020 8327 7471** and speak to the duty doctor
Emergency HBIG will be sent to the location specified by the requester.

Ward/Unit:	Hospital:	FAO:

IMW281.05 – Infant Hepatitis B Immunoglobulin Issue Request Form. Version 3. UK Health Security Agency gateway number: 2021905

If baby has already delivered, please also complete this birth notification form

Maternal antiviral treatment (during last trimester of pregnancy)

Mother's Hepatologist or equivalent	Name:	Telephone number:
Antiviral treatment in pregnancy	☐ Yes (if yes, please fill in the details below)	☐ No

Drug name	Dose	Start date	End date

Delivery

Infant's surname:

First name:

NHS number

Hospital number:

Sex ☐ Male ☐ Female

Date of birth:

Time of birth:

Type of delivery:

Birth weight:

Gestation:

If multiple birth please specify number of babies (please complete a separate form for each sibling)

Vaccine and HBIG administration

NOTE
The infant should receive **200iu-250iu of HBIg intra-muscular injection and paediatric hepatitis B vaccine** immediately after birth.
Vials of HBIG are approx. 500IU so the whole vial should not be given. 200iu vials may be available in the future.

Vaccine	HBIG
Date given:	Date given:
Dose given:	Dose given:
Make of vaccine:	Time given:
Batch no.:	Batch no.:

*If baby is very low birth weight and clinical decision made to give divided doses, please record when 2nd part of dose was given (should be given ASAP)

HBIG (2nd part of dose*)	Date given:	Dose given:	Time given:	Batch no.:

Doctor responsible for future care of the infant (if not GP)

Name:

Title/Position:

Contact no.:

Address:

Form completed by:

Contact no.:

Date:

Please send completed form via email to:
phe.hepatitisbbabies@nhs.net from **@nhs.net** email address only.
Please communicate to the GP or responsible clinician for care of the baby that the infant should be given the second dose of HepB vaccine at 4 weeks old and follow the immunisation schedule in The Green Book.

IMW281.05 – Infant Hepatitis B Immunoglobulin Issue Request Form. Version 3. UK Health Security Agency gateway number: 2021905

Appendix 4 – Checklist

Public Health England **HEPATITIS B (HEP B) SCREENING AND IMMUNISATION MATERNAL AND PAEDIATRIC CHECKLIST**	Please complete or attach patient label Unit number: …… NHS number: …….. Surname …….. Forename(s) …….. Date of birth ……/……/……

Date of booking……/……/……

Date of hep B screen……/……/…..

Date of screening result……/……/……

Date of screening……/……/…… team assessment

Date of specialist…./……/…… appointment

Serology results

Test	Date of test	Result
Viral load		
HCV		
LFTs		
Other test results		

Lower infectivity ☐ Higher infectivity ☐

	Screening team appointment (≤ 10 working days of laboratory result/notification)	Status/comments	Date	Signature and name in capitals
All women: higher or lower infectivity	Discuss care using 'Hep B: a guide to your care in pregnancy and after your baby is born'			
	Additional bloods taken as per local guidelines. Maternal venous sample sent to PHE Colindale. Check and record all other antenatal results.			
	Inform GP, H/V, HPT, CHIS and CMW.			
Within 6 weeks of result/notification				
All women with hepatitis B	Specialist MDT appointment. **High infectivity and all newly diagnosed women:** within 6 weeks or by 24 weeks gestation. **Low infectivity known status:** 18-week OPD target or within 6 weeks if ≥ 24 weeks			
	Create neonatal alert			

Higher infectivity women only	Submit a HBIG request as per trust practice. 7 weeks before EDD PHE coordinator will send: • HBIG to your pharmacy • delivery suite box to screening team to match up with HBIG and place in box • box which should be stored according to trust practice and the location clearly noted on the maternal record. Notify the PHE co-ordinator if the woman's care is transferred.			
34-week pre-birth consultation/screening team review		**Status/comments**	**Date**	**Signature and name in capitals**
All women	**Preparation for birth** Discuss care and adherence to schedule using PHE 'Protecting your baby from hep B' leaflet. Check neonatal alert is in place.			
Higher infectivity	Confirm where **PHE hep B delivery suite box** containing HBIG is stored and that the location is recorded in notes/birth plan/maternity information system.			
Delivery suite team				
Higher infectivity mother and baby	**On admission:** • inform screening team of admission • locate PHE hep B delivery suite box			
	Using the hep B delivery suite box - take maternal serology sample after delivery and complete form (pack 1)	Date/time of blood test		
	- take neonatal 'hep B dried blood spot' prior to vaccination (pack 2) - give HBIG + hep B vaccination (pack 3) - complete PCHR red book hep B page and give to mother	Card number/time of blood test. Date/time given/batch number.		
	- complete paperwork and store with samples in hep B delivery suite box and return to screening team as soon as possible (if weekend/BH: recommend store in fridge at 4°C or room temperature if not available)			

Lower infectivity mother and baby	- vaccination administered ≤24 hours of birth - complete PCHR red book hep B page and given to mother	Prescription in notes/batch number.		
Post-natal				
Pre-discharge checks	- PCHR book has completed hep B page - mother has a copy of the vaccination leaflet - mother informed of the importance of early registration of the birth with a GP - ensure notes go back to screening team			
Screening team	- check request form for maternal sample and PHE notification forms are completed - DBS and bloods and forms despatched to PHE Virus Reference Department, Colindale in pre-paid packaging - inform CHIS, H/V GP, and CMW of vaccination using PHE letter templates - complete ISOSS database			

Appendix 5 Suggested Neonatal Care Pathway for adaptation at local hospital

1. Antenatal screening team start checklist – appendix 4
2. Neonatal plan made at fetal medicine meeting and inserted into mother's hospital notes.
3. When infant is born neonatal team alerted – results of mothers' serology and neonatal plan reviewed.
4. Administration of Hepatitis B vaccine with dried blood spot taken prior to vaccination (only if high risk) and HBIG if indicated.
5. Hepatitis B vaccination flimsy filled in (for red book) and documented on checklist and accompanying paperwork if HBIG given.
6. Letter to GP and Child health generated
7. GP/ Child health to organise subsequent vaccinations and testing with 4th dose (dried blood spot sent to Public Health England laboratory).
8. GP to refer infants with chronic carrier status for assessment and further management.

Exceptional Circumstances Form

Form to be completed in the **exceptional** circumstances that the Trust is not able to follow ODN approved guidelines.

Details of person completing the form:	
Title:	Organisation:
First name:	Email contact address:
Surname:	Telephone contact number:
Title of document to be excepted from:	
Rationale why Trust is unable to adhere to the document:	
Signature of speciality Clinical Lead: Date:	Signature of Trust Nursing / Medical Director: Date:
Hard Copy Received by ODN (date and sign):	Date acknowledgement receipt sent out:

Please email form to: kelly.hart5@nhs.net requesting receipt.

Send hard signed copy to: Kelly Hart
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