# MCN for Neonatology
# West of Scotland
# Neonatal Guideline

# Management of infants born to HIV positive mothers

This document is applicable to all medical, midwifery and nursing staff caring for the newborn in hospital or community. The guideline should be used with reference to the relevant pharmacy monographs. Staff should be aware of the importance of strict confidentiality at all times and this aspect of the infant's care should be discussed with the mother alone unless she has indicated that her partner (or other relative) may be party to these discussions.

**Local Follow Up Arrangements for antenatal care:** In Glasgow, pregnant women with HIV infection will be referred to the Princess Royal Maternity and their care coordinated with the Brownlee Centre at Gartnavel

## INTRODUCTION

With appropriate anti-retroviral treatment of mothers during pregnancy and labour and avoidance of breast feeding as appropriate (see below), the risk of transmission of HIV from mother to baby is reduced from 40% to <0.1%. The risk of perinatal transmission depends primarily upon the maternal viral load at delivery; where this is detectable; the likelihood of transmission will be influenced by duration of rupture of membranes, mode of delivery, gestational age, co-existing maternal viral infection and intra-partum prophylaxis. Breast feeding significantly increases the risk of perinatal transmission; although breast feeding can now be supported when mum's viral load is completely suppressed, given the safety and affordability of formula feeding, all HIV positive women in the UK are currently advised to formula feed their baby.

## DELIVERY

For women with detectable viral load at the time of delivery (*ie* ≥ 50 copies/ml), elective pre-labour caesarean section reduces the risk of transmission. Where the maternal viral load is not detectable at delivery caesarean section confers little additional benefit, and vaginal delivery is recommended wherever possible. *This is particularly true where a mother may be returning to a developing country with reduced access to caesarean section for subsequent pregnancies.* The decision as to mode of delivery will generally have been made prior to labour by a consultant obstetrician.

Most neonates born to mothers known to be HIV infected in pregnancy will have been exposed to anti-retroviral therapy in utero and during labour. Regimes vary according to maternal health and viral load, and it is important that each case is considered individually, particularly if there is any drug resistance. A plan of management for the infant should be documented in the mother's electronic patient record prior to delivery.

It is important that the paediatrician on call is notified as soon as the mother is admitted either for elective caesarean section or in active labour so that arrangements can be made for treatment of the baby **within 4 hours of birth**. It is not necessary either for the paediatrician to attend the delivery or for the baby to be admitted routinely to the nursery.

## PRETERM LABOUR

In the event of threatened or actual preterm labour, an assessment must be made by a consultant obstetrician as to the most appropriate mode of delivery. This decision will be influenced by the presence of ruptured membranes. At <32 weeks' gestation, delivery should be postponed if possible, pending administration of antenatal steroids.

## MANAGEMENT OF THE INFANT AT BIRTH

The infant's face and eyes should be cleaned at delivery and the infant bathed as soon as is practicable after birth, taking care to avoid hypothermia.

In most cases a plan of management for the infant will have been documented in the mother's casenotes. It is important, however, to check that the circumstances leading to this decision have not changed (e.g. maternal viral load); if there is any doubt as to the most appropriate treatment for the infant, the case should be discussed with the on-call consultant.

Baseline bloods (venous sample) should be taken on day 1, unless the baby is born at the weekend. Outwith normal working hours, blood samples can be taken soon after delivery and stored in the refrigerator until the next morning. For babies born at the weekend (after 4.00pm on Friday) blood samples should be deferred until first thing on the Monday morning.

**DO NOT DELAY ADMINISTRATION OF POST-EXPOSURE PROPHYLAXIS PENDING THESE BLOODS**

- HIV RNA. (*NB Choose* ***HIV viral load*** *on Trakcare*) This will be analysed at the Regional Virus Laboratory in the New Lister Building at Glasgow Royal Infirmary. See sample requirements below. **Note that cord blood is not suitable for PCR because of the likelihood of contamination by maternal blood**.
- If the mother's HIV antibody status is not known, please also request HIV antibody screen (this can be done on the same EDTA sample)
- If the baby is unwell for any reason, investigations should include amylase, lactate and capillary blood gases as certain antiretroviral drugs (particularly protease inhibitors) can cause metabolic disturbance.

### Sample requirements for the HIV RNA test

- 2ml blood (minimum 1.5ml)
- EDTA (purple top) – use small adult vacutainer
- Phone lab so that they can look out for the sample
    - 0141 201 8722 (select option 1)
    - NB - 38722 short code within Glasgow
- Send sample to the Regional Virus Laboratory, Glasgow Royal Infirmary
- At the weekends, please ensure sample arrives in the laboratory before 12.30pm (call first)

### Immunisations

All infants born to HIV infected mothers should be immunised according to the standard schedules, including oral rotavirus vaccine. Low and very low risk babies at increased risk of tuberculosis should be offered BCG shortly after birth or at the first available clinic appointment. For the convenience of parents, BCG may be offered in the neonatal clinic at six weeks of age. coincident with the first repeat viral load.

Higher risk babies (*i.e. detectable maternal viral load or breast fed)* should not be given BCG vaccination until they have tested negative at three months (or 2 months after the cessation of breast feeding – *see section 4)*

**TREATMENT OF THE INFANT**

As per current BHIVA (British HIV Association) guidelines (2018):

**1. *VERY LOW RISK*: (all 3 criteria to be fulfilled)**

- **Mother has received combination anti-retroviral therapy for at least 10 weeks leading up to delivery**
- **Maternal viral load has been < 50 copies/mL on the two most recent occasions during pregnancy, at least 4 weeks apart.**
- **Gestation ≥ 34 weeks**

**Two weeks' zidovudine monotherapy (even if maternal resistance)**

**Dosage:** oral zidovudine 4 mg/kg twice daily from birth to 2 weeks of age

**2. *LOW RISK:***

- **If the criteria for very low risk babies (above) are not all fulfilled but maternal HIV viral load is <50 HIV RNA copies/mL at or after 36 weeks;**
- **If the infant is born prematurely (<34 weeks) but most recent maternal HIV viral load is <50 HIV RNA copies/mL.**

**Four weeks' zidovudine monotherapy (even if maternal resistance)**

**Dosage:** **1. Well infant ≥ 34 weeks' gestation**

Oral zidovudine 4mg/kg twice daily from birth to 4 weeks of age

**2. Well infant, 30 – $33^{+6}$ weeks' gestation**

Oral zidovudine 2mg/kg twice daily for the first 2 weeks then 2mg/kg three times daily for a further 2 weeks

**3. Well preterm infant, < 30 weeks' gestation**

Oral zidovudine 2mg/kg twice daily for 4 weeks

**4. Any infant who is sick or intolerant of oral medication**

≥ 34 weeks' gestation – IV zidovudine 1.5mg/kg every 6 hours
< 34 weeks' gestation - IV zidovudine 1.5mg/kg every 12 hours - change to every 6 hours once baby is $34^{+0}$ weeks corrected gestational age
If there is any doubt that oral medication will not be tolerated the baby should be admitted to special care. Have a low threshold for starting parenteral treatment.

**2. *HIGHER RISK*:**

- **< 72 hours old born to untreated HIV positive mother or infants born to mothers who have a known or likely detectable viral load (≥ 50 copies/ml) or if maternal compliance is in doubt**

**Triple therapy – see below**

***In addition,* some higher risk infants will require PCP prophylaxis**

- **Initial positive infant HIV RNA test, or any viral load ≥ 50 copies/mL thereafter, until HIV infection excluded**

**Treatment – Triple therapy – see below – *then, from 4 weeks of age,*** co-trimoxazole as PCP prophylaxis given orally until the child is confirmed likely free of infection at three months. The dose is given as a single daily dose three times weekly on Mondays, Wednesdays and Fridays. The dose is 120 mg up to 6 months of age and 240 mg between 6 and 12 months, of the paediatric suspension (240mg/5ml) given three times weekly. **It is the responsibility of the doctor discharging the child to ensure that arrangements for prescription and supply of co-trimoxazole (when required) are in place before the baby goes home**. The GP should be contacted by telephone, and if this is not possible, the baby should be given an early outpatient appointment for clinic at 2 weeks of age.

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| i.e. | oral zidovudine | • ≥ 34 weeks – 4mg/kg twice daily for 4 weeks<br>• 30 – $33^{+6}$ weeks - 2mg/kg twice daily for 2 weeks then 2mg/kg three times daily for a further 2 weeks<br>• < 30 weeks - 2mg/kg twice daily for 4 weeks<br><br>See local monograph for advice in regards to rounding of doses |
| plus | oral lamivudine | • All gestations – 2mg/kg twice daily for 4 weeks |
| plus | oral nevirapine<br><br>***OR*** oral raltegravir** where the mother is HIV-2 positive | • All gestations - 2mg/kg once daily for the first week, increasing to 4mg/kg once daily for the second week then stop.<br><br>If the mother has been taking nevirapine antenatally, for 3 or more days immediately prior to delivery, the infant's liver enzymes will already be induced and he/she should be commenced on the higher dose and continued on this dose for two weeks.<br><br>See monograph for Raltegrivir once daily starting dose, which is dependent on both gestation and birth weight |
| | | **Nevirapine will be ineffective for HIV-2. Use raltegravir as third agent until advice has been sought from the ID team |

Note that treatment regimen may need to be adjusted if the mother has a history of multiple antiretroviral therapy exposure and resistance. Such cases will require consultant discussion (preferably before delivery).

## 4. *BREAST-FEEDING & HIV INFECTION*:

Breast feeding is an important route of transmission of HIV. In the UK, where safe infant feeding alternatives are available, HIV infected women are advised to formula feed, and there are arrangements for free provision of infant formula to HIV positive women. BHIVA guidelines recommend that mothers who agree to formula feed should be offered lactation suppression; please ensure that this has been considered by the obstetric/midwifery team.

NB. When mothers are at high risk of acquiring HIV infection, but have tested negative throughout pregnancy, the risk of transmission through breastfeeding is about 30% when a mother acquires HIV infection after delivery.

There is now evidence from developing countries that breast feeding while mum's viral load is fully suppressed is safe, and BHIVA/CHIVA no longer regard a decision to breast feed as grounds for referral to child protection services. For HIV positive women who choose to breast feed, maternal HAART should be carefully monitored and continued until one week after all breastfeeding has ceased. The mother's viral load should be tested monthly to ensure that HIV virus remains undetectable; this testing will be undertaken by the obstetric/ID team. It is recommended that breastfeeding be exclusive, and completed by the end of 6 months.

Prolonged infant prophylaxis during the breastfeeding period is not recommended - the baby should receive 2 or 4 weeks of oral zidovudine as per standard guidelines.

### *The breast fed baby's follow-up and testing should be as follows:*

viral load at 2 weeks and at 6 weeks
viral load monthly thereafter until 2 months after cessation of breastfeeding
HIV antibody at 22 - 24 months

BCG vaccine (if indicated) should not be given until the final viral load is known to be negative (*ie* 2 months after cessation of breast feeding). There is no need for mantoux testing in babies less than one year of age.

### *Breast feeding advice and support*

If the mother develops a cracked nipple or mastitis, breast feeding from that side should be temporarily suspended, and urgent lactation support sought. Lactation may be maintained by expressed/pumping of milk, but milk from the affected breast should be discarded.
Breast feeding should cease by six months.
There is little evidence to support the transition to formula feeding, which should ideally occur before the introduction of weaning foods. If mother's viral load is undetectable, it is however unlikely that a few days of mixed breast and bottle feeding poses a significant risk.
Abrupt cessation of breast feeding is likely to result in breast engorgement; this may be alleviated by a gradual reduction in expressing/pumping of milk after the baby has been transitioned to formula feeding (the expressed milk should be discarded). The support of a health visitor and/or lactation expert should be sought.

**Useful parental information has been prepared by BHIVA:**

***HIV and breastfeeding your baby***

***General information on infant feeding for women living with HIV***

## 5. FOLLOW-UP

Unless there are other medical or social problems, the infant can be discharged home once medical and nursing staff are happy that the oral antiretroviral medication is being tolerated. It is very important that the mother understands the importance of good compliance with the treatment, and that she is advised to seek help early if the baby does not tolerate the medication or becomes unwell in any way.

Arrangements should be made for review at 6 (or 2, if breast fed) weeks of age, and the parents informed that blood tests will be repeated at this visit. **N.B.** A double appointment slot should be requested.

**Local Arrangements for follow up:**
Most babies born to mothers with HIV in GG&C are followed up in the Princess Royal Maternity in Dr Mactier / Dr Powls clinic

Remember to check if the HIV status of any siblings has been checked; if not, then refer to Drs. Conor Doherty or Rosie Hague at RHC

**Follow up testing**

**N.B.** In order to avoid confusion follow up bloods must be labelled with the following

- Baby's birth surname as well as (if appropriate) his/her registered surname
- Hospital number
- CHI number
- Date of birth.

**(High risk or breast fed babies only) 2 weeks:** HIV RNA PCR. (**HIV *Viral load*** *on TrakCare*)

**6 weeks:** HIV RNA PCR. (**HIV *Viral load*** *on TrakCare*)

**3 months:** HIV RNA PCR. (**HIV *Viral load*** *on TrakCare*)

***NB – interpreting viral load results –*** *A viral load of < 40 copies/mL is a negative test. If the sample was of too little volume a 1:10 dilution will be performed and the result will show as < 80 (or 400) copies/mL. This also indicates a negative result. Since BHIVA recommend a cut off of 50 copies/mL, a maternal viral load of 45 copies/mL would not change the infant's risk category.*

If baby is HIV RNA positive, then he/she should be referred immediately to Drs. Conor Doherty or Rosie Hague at RHSC Yorkhill

**9-10 months:** Clinic appointment to monitor developmental progress. Advise parents that infant will be seen again at 22-24 months to check for disappearance of maternal antibody.

**22-24 months:** Clinical review, HIV antibody (***HIV Screen*** *on TrakCare*) to check for disappearance of maternal antibody. This requires 1-2ml EDTA sample

## SUMMARY

Have you checked the maternal birth plan?

What is most recent maternal viral load? (If > 50 copies/ml, consider whether birth plan may need amended and discuss with consultant as a matter of urgency).

Post exposure prophylaxis (PEP) should be commenced within 4 hours of delivery

Ensure follow up appointment at six weeks of age (sooner for higher risk or breast fed babies)

**Useful Resources**

British HIV association (BHIVA) website- www.bhiva.org
HIV /Aids Treatment Information service (HIVATIS) USA site – www.hivatis.org
Dr Conor Doherty – Royal Hospital for Children, Glasgow

**References**

BHIVA Guidelines 2018 (2020 Third interim update)

**Author**

Dr H Mactier – Neonatal Consultant PRM.

**Other specialists consulted**

Infectious Diseases – Dr C Doherty

Pharmacy – Fiona Marra and June Grant

Virology – Dr Celia Jackson

Obstetrics – Dr Elizabeth Ellis

**Document Name**

WoS_HIV_Neonates

**Start / Review Dates**

Implementation 18/01/16  Last Update 03/09/20  Next Review 01/09/23