



Human Immunodeficiency Virus (HIV) – Maternal and Neonatal Care

1. Purpose

This guideline is to provide a pathway for the care of obstetric women with human immunodeficiency virus (HIV) infection and the prevention of mother-to-child transmission of HIV at the Women's.

Key elements include:

- [Communication](#)
- [Antenatal management](#)
- [Intrapartum management](#)
- [Post-delivery management](#)
- [Infant management](#)
- [Diagnosis of HIV in infants – at the Women's and the Royal Children's Hospital](#)
- [Suggested follow up testing for infants at risk – at the Royal Children's Hospital](#)
- [Infant Pneumocystis jiroveci Pneumonia \(PJP\) prophylaxis – at the Royal Children's Hospital](#)
- [Infant immunisations](#)
- [Discharge Planning.](#)

2. Definitions

HIV: Human Immunodeficiency Virus.

Antiretroviral therapy: medicines to suppress the HIV virus and stop the progression of HIV disease e.g. zidovudine.

Viral load: test is used for monitoring the level of virus present after the initial diagnosis of HIV.

Pneumocystis: the most common opportunistic infection in persons with HIV infection.

3. Responsibilities

All clinicians responsible for the antenatal and intrapartum care of HIV positive women and the care of infants with a HIV positive mother, are required to adhere to this guideline.

4. Guideline

All women who present for antenatal care at the Women's should be offered HIV antibody screen, as per guidelines published by the RANZCOG and the National HIV testing policy.

Advances in the management of HIV during pregnancy have resulted in the risk of transmission being reduced from between 15 to 25% in women who have no interventions during pregnancy or postpartum to less than 1% when interventions are utilised.

Interventions that have been shown to reduce HIV transmission from mother to infant include:

- Antiretroviral therapy given to the mother during pregnancy and to the infant post delivery
- Elective caesarean section if the HIV viral load (VL) is >50 copies/ml
- Exclusive formula feeding.

If possible, avoid interventions that may increase the risk of transmission:

- Artificial rupture of the membranes
- Use of fetal scalp electrodes
- Fetal blood sampling.

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4.1. Communication

Pregnant women who are HIV positive require an integrated multidisciplinary approach by experienced HIV physicians, obstetricians, clinical nurse specialists, midwives, pharmacists and paediatricians who work closely during the pregnancy.

Management of the infant differs depending on the status of the maternal HIV infection. For this reason, communication between the members of this team is extremely important. Table 1 outlines who should be notified when a HIV positive woman presents to the Women's.

Contact details for the involved teams are as follows:

Infectious Diseases (ID) Consultation – HIV specialist

- Dr Michelle Giles, Infectious Diseases (ID) Physician (contactable via the Women's switchboard 8345 2000). If Dr Giles is unavailable, please contact the microbiology registrar or the Clinical Microbiology Consultant via the Women's switchboard.
- The Infectious Diseases team will liaise with the Royal Children's Hospital (RCH) Infectious Disease team to organise an antenatal appointment and postnatal follow up:
 - The contacts at the RCH are Dr Tom Connell or Dr Penelope Bryant (contact via RCH switchboard (9345 5522)). If these physicians are unavailable, the paediatric infectious diseases fellow can be contacted via the RCH switchboard.

The Women's Neonatal Medical Team

The Neonatal Consultant Oncall can be contacted via the Women's switchboard. If they are unavailable please contact the Neonatal Intensive and Special Care (NISC) Fellow via switchboard.

Table 1: Who should be notified when a HIV positive woman presents to the Women's

Scenario	Who should be notified
Known HIV positive woman becomes pregnant	Red team - Medical Team Leader & Midwifery Team Leader
New HIV diagnosis from booking bloods	Infectious Diseases (ID) team – HIV specialist Pharmacists (maternal & neonatal) – via HIV specialist RCH Paediatricians – (ID team to arrange)
Known HIV positive woman presents for elective caesarean section	Red team Infectious Diseases (ID) team – HIV specialist The Women's Pharmacists (maternal & neonatal) The Women's Neonatal Medical Team
HIV positive woman presents in labour	Maternity Team on call Infectious Diseases (ID) team – HIV specialist The Women's Pharmacists (maternal & neonatal) The Women's Neonatal Medical Team

4.2. Antenatal Management

- All HIV positive antenatal patients should be referred to the ID physician for the management of maternal anti-retroviral treatment during pregnancy. The anti-retroviral treatment regimen will be tailored to the individual according to viral resistance studies and safety data in pregnancy
- Treat any infection (Sexually Transmitted Infection (STI), urinary tract infection) in consultation with the ID physician

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- Prenatal diagnostic tests such as Chorionic Villus Sampling (CVS) and amniocentesis may be offered where appropriate. However the procedures may increase the risk of perinatal transmission and should be discussed with the ID physician
- Infants in breech presentation, discuss external cephalic version with the ID physician and obstetrician.

4.3. Intrapartum Management

- For women taking highly active antiretroviral therapy (HAART), a decision regarding the recommended mode of delivery should be made after review of plasma HIV viral load (VL) results at week 36
- Vaginal delivery is recommended for women on HAART with a VL < 50 HIV RNA copies/mL at gestational week 36 and in the absence of obstetric contraindications
- Intrapartum intravenous (IV) zidovudine is no longer required for HIV-infected women receiving combination anti-retroviral regimens and has VL < 1000 HIV RNA copies/mL near delivery
- HIV-infected women with VL \geq 1000 HIV RNA copies/mL (or unknown VL) near delivery should have IV zidovudine administered during labour, regardless of antepartum regimen and mode of delivery
- Avoid rupture of membranes, unless a reasonable expectation of normal delivery is within 4 hours
- Oxytocin can be given for induction or augmentation of labour with intact membranes
- No invasive monitoring (fetal blood sampling or fetal scalp electrodes) if possible
- If instrumental delivery is required, forceps is preferred to ventouse
- Although there is no data demonstrating increased perinatal HIV transmission with instrumental delivery or episiotomy in the HAART era, it is generally advisable to avoid unless there is a clear obstetric indication
- Contact pharmacist for supply of IV zidovudine for intrapartum use and zidovudine syrup for the infant in preparation of birth during pharmacy hours, or obtain medicines from the afterhours cupboard outside pharmacy hours
- **Maternal management:** A loading dose of zidovudine is usually required followed by a continuous infusion. Once the umbilical cord is clamped, intravenous treatment may be ceased
- **Infant management:** Commence oral zidovudine within 6 hours of delivery (see [Infant management section](#) below)
- **Maternal zidovudine dose** ([Appendix 1: IV zidovudine dose calculation](#) and complete [Appendix 2: SAS form](#)):
 - The IV zidovudine infusion should be started 4 hours prior to planned caesarean section. The duration of zidovudine administration prior to caesarean section can be shortened under certain circumstances, after consultation with the Infectious Disease (ID) physician
 - Loading dose: administer IV zidovudine at 2mg/kg over 1 hour and continue with
 - Maintenance : at 1mg/kg/hour until the umbilical cord is clamped.

4.4. Post-delivery Management

It is important to minimise any risks of maternal to child blood mixing. This can be minimised by:

- Gently wipe the infant's eyes of secretions upon delivery of the head
- Suction is not generally required, but if it is, be gentle to avoid damage to mucous membranes
- Clamp the cord as soon as possible, milking between the clamps in a direction away from the infant



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- Place a sponge over the cord before cutting to prevent spurting of blood
- Once born, towel-dry the infant. This should be performed prior to any procedures on the infant that will disrupt skin or mucous membrane integrity such as the intramuscular administration of Vitamin K
- Ensure that standard precautions are utilised when handling/cleaning up of blood/body fluid spillage
- Breastfeeding is to be avoided in women with HIV due to the risk of viral transmission through breast milk. Formula feeds are recommended
- Skin-to-skin contact between mother and infant should be encouraged.

4.5. Infant Management

Infant management should always be in consultation with an ID Physician. The choice of anti-retroviral therapy for the infant is dependent on the maternal HIV status (timing of maternal diagnosis, viral load at/near delivery, maternal HIV anti-retrovirals and maternal HIV resistance profile):

- A 4-week course of oral zidovudine is recommended for all HIV-exposed infants
- Administration of oral zidovudine should be started as soon after birth as possible, within 6 hours of delivery
- If the infant is unable to tolerate oral administration, the zidovudine prophylaxis regimen can be administered intravenously.

See neonatal pharmacopeia – [zidovudine monograph](#) for dosing and monitoring.

In some circumstances, additional antiretroviral medicines may prescribe for the infant. A paediatric infectious diseases physician would make this decision on an individual case basis.

Additional antiretroviral (ARV) medicines may be needed in HIV-exposed infants of:

- Mothers who received antepartum and intrapartum ARV medicines but who had suboptimal viral suppression at delivery, particularly if delivery was vaginal
- Mothers who received only intrapartum ARV medicines
- Mothers who received neither antepartum nor intrapartum ARV medicines, and
- Mother with known ARV drug-resistant virus.

Dr Tom Connell or Dr Penelope Bryant should be contacted via the RCH switchboard if there are concerns regarding toxicity that may require a change in anti-retroviral treatment.

4.6. Diagnosis of HIV in infants - at the Women's and the Royal Children's Hospital

Whilst the diagnosis of HIV infection in adults is readily established by the detection of HIV antibodies, the situation is more complex in infants of HIV positive women.

During pregnancy, the fetus passively acquires maternal HIV antibodies across the placenta. Therefore all infants born to HIV positive women will test positive to HIV antibodies for at least the first six months of life. It can take up to 12 to 18 months for an infant to clear these maternal antibodies. Therefore, the HIV antibodies test cannot be relied upon for the diagnosis of HIV in these infants and should not be performed before the infant is twelve months of age. For this reason, a sensitive nucleic acid based technique called the polymerase chain reaction (PCR) is used to detect the presence of HIV in infants. Multiple negative tests to age 3 months are required to confirm an uninfected status in exposed infants.

In uninfected infants, it is recommended that the infant have a HIV antibody test at 12 to 18 months to show that the infant has cleared all the passively acquired HIV antibodies.

If a PCR is positive, the test is always repeated as soon as possible (on a new sample) before it is confirmed that the infant is infected.

4.7. Suggested follow up testing for infants at risk – at the Royal Children's Hospital

Once the infant has been born, an Infant Referral Form will be faxed to the Outpatient Department at the Royal Children's Hospital by the Women's HIV clinical nurse consultant, who routinely visits the woman after birth. This ensures that an appointment is made for the infant at the Infectious Diseases clinic with Dr Tom Connell or Dr Penelope Bryant.

For infants being followed up at other centres, the proposed follow up testing is outlined in the table below.

Table 3: Testing regimen for infants post birth

Test	At the Women's	At the Royal Children's Hospital			
	Day 2	2 weeks	6 weeks	3-4 months	12-18 months
FBE	Yes	Yes	Yes	Yes	Yes
LFT's	No	Yes	Yes	Yes	Yes
HIV PCR*	Yes	No	Yes	Yes	No
HIV antibody	No	No	No	No	Yes

*Please take at **least 2mL** from a peripheral vein for HIV PCR testing.

All infants who have been exposed to HIV in the perinatal period should have close follow-up.

4.8. Infant *Pneumocystis jiroveci* Pneumonia (PJP) prophylaxis - at the Royal Children's Hospital

- *Pneumocystis jiroveci* Pneumonia (PJP) is also known as *Pneumocystis carinii* Pneumonia (PCP).

The decision regarding PJP prophylaxis should be made in conjunction with the paediatric infectious diseases team. In premature infants who are expected to be inpatients at six weeks of age, please ensure their case has been discussed with Dr Tom Connell or Dr Penelope Bryant (Royal Children's Hospital) and a clear plan concerning their ongoing management has been formulated:

- PJP prophylaxis is not recommended for 'low risk' infants for whom all preventive interventions have been utilised and have two negative HIV PCR results
- PJP prophylaxis may be recommended for high risk infants whose mother's VL at 36 weeks or at delivery is >1000 HIV RNA copies/mL despite HAART or unknown VL. PJP prophylaxis may be given after 6 weeks of age if HIV has not been excluded.

4.9. Infant Immunisations

Routine childhood immunisations (DTPa-IPV, HepB-Hib, rotavirus vaccine, MMR, meningococcal and pneumococcal disease) should be given to all infants born to HIV-positive mothers.

Live vaccines (such as MMR, varicella and BCG), should only be administered after consultation with the paediatric infectious diseases team.

4.10. Discharge Planning

As with the antenatal care of HIV positive women, the postnatal care of the women and their infants requires a multi-disciplinary approach. Please ensure the Women's clinicians and the Royal Children's Hospital's Infectious Diseases team are informed of the planned discharge date at least 48 hours prior to discharge.

At the Women's, please inform both:

- Dr Michelle Giles via the Women's switchboard (or HIV Clinical Nurse Specialist on 9076 3658) and
- The pharmacists for supply of medicines.



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The Royal Children's Hospital Infectious Diseases Team:

- The HIV Clinical nurse specialist will ensure that a referral has been made for a 2 week follow up appointment with Dr Tom Connell or Dr Penelope Bryant at the Royal Children's Hospital.

5. Evaluation, monitoring and reporting of compliance to this guideline

Compliance to this guideline will be monitored, evaluated and reported by reporting of clinical incidents on the VHIMS system.

6. References

1. British HIV Association (BHIVA), Guidelines for the management of HIV infection in pregnant women <http://www.bhiva.org/PregnancyGuidelinesConsultation.aspx>
2. Royal College of Obstetricians and Gynaecologists (UK). <http://www.rcog.org.uk/>
3. Panel on Treatment of HIV-Infected Pregnant Women and Prevention of Perinatal Transmission. Recommendations for Use of Antiretroviral Drugs in Pregnant HIV-1-Infected Women for Maternal Health and Interventions to Reduce Perinatal HIV Transmission in the United States. Available at <http://aidsinfo.nih.gov/contentfiles/lvguidelines/PerinatalGL.pdf>. [Accessed 27/11/2012]
4. The 2009 PENTA Guidelines for the use of antiretroviral therapy in paediatric HIV infection. <http://www.pentatrials.org/guidelines.htm> [Accessed 27/11/2012]

7. Legislation related to this guideline

Not applicable.

8. Appendices

Appendix 1: [IV Zidovudine for Maternal Intrapartum Management](#)

Appendix 2: [SAS form – IV Zidovudine for Maternal Intrapartum Management](#) (link).

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IV Zidovudine for Maternal Intrapartum Management



IV zidovudine for maternal intrapartum management (Dose calculation guide according to maternal body weight)				
Maternal weight (kg)	Loading dose rate of infusion (to be run over 60 mins)		Maintenance rate of infusion (to run after loading dose and until the cord is clamped).	
	Dose (mg)	Volume/hr = [weight (kg) x 2mg] / 4	Dose (mg/hr)	Volume/hr = [1mg/kg/hr] / 4
50	100	25mL	50	12.5mL
55	110	27.5mL	55	13.8mL
60	120	30mL	60	15mL
65	130	32.5mL	65	16.3mL
70	140	35mL	70	17.5mL
75	150	37.5mL	75	18.8mL
80	160	40mL	80	20mL
85	170	42.5mL	85	21.3mL
90	180	45mL	90	22.5mL
95	190	47.5mL	95	23.8mL
100	200	50mL	100	25mL
105	210	52.5mL	105	26.3mL
110	220	55mL	110	27.5mL
Using zidovudine 4mg/mL intravenous solution				

IV zidovudine infusion preparation (maternal):

- Withdraw 40mL of sodium chloride 0.9% from a 100mL sodium chloride 0.9% bag
- Add 400mg (40mL zidovudine solution) to the 100mL sodium chloride 0.9% bag
 - this solution gives a total concentration of 400mg in 100mL (i.e. 4mg/mL)
- Diluted zidovudine infusion bags are stable for 24 hours at room temperature.

Incompatibilities:

- Check with the pharmacist if there is an intention to co-administer with another drug via a Y site.