# MANAGEMENT of HIV EXPOSED INFANTS

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# Outline

# INTRODUCTION

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- Most pediatric HIV infections result from vertical transmission (90%).
- HIV prevalence among pregnant women in Malaysia remained low, 0.06% - 0.07% since 2011.
- The vertical transmission of HIV can be effectively controlled through PMTCT (Malaysia in 1998)

- In line with the WHO guideline, Malaysia adopted the programmatic target of < 2% for HIV MTCT rate.
- All HIV-exposed infants get free ARV prophylaxis and free replacement feeds.
- The programme had been able to avert > 98% vertical transmission in HIV-exposed infants in 2017 compared to 30-40% when no intervention, subsequently leading to Malaysia being certified as the 1st country in Western Pacific Region having eliminated vertical HIV transmission.

Figure 19: Vertical transmission rate of HIV, Malaysia (2011-2021)

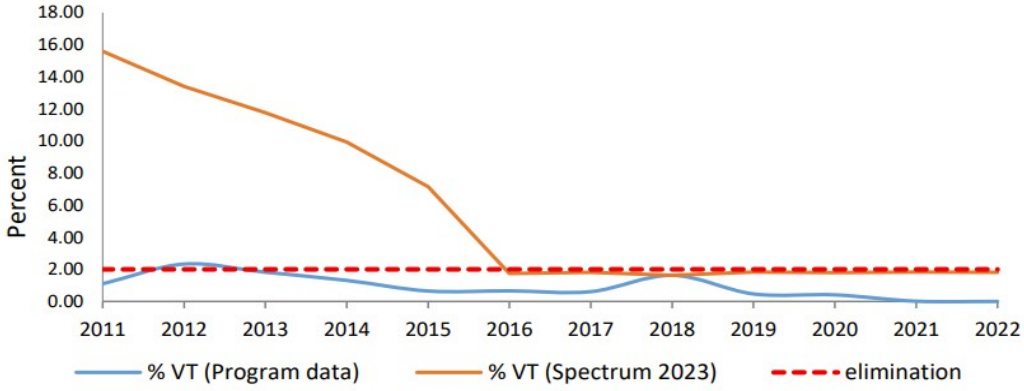
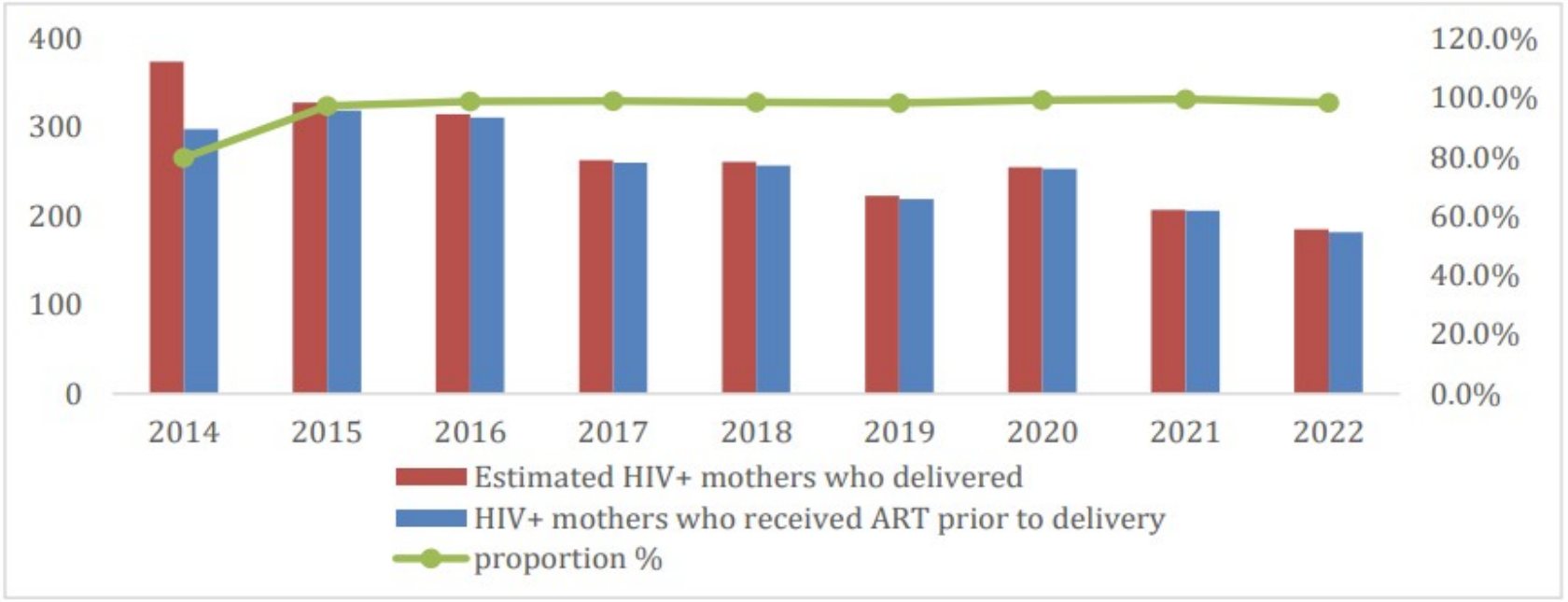
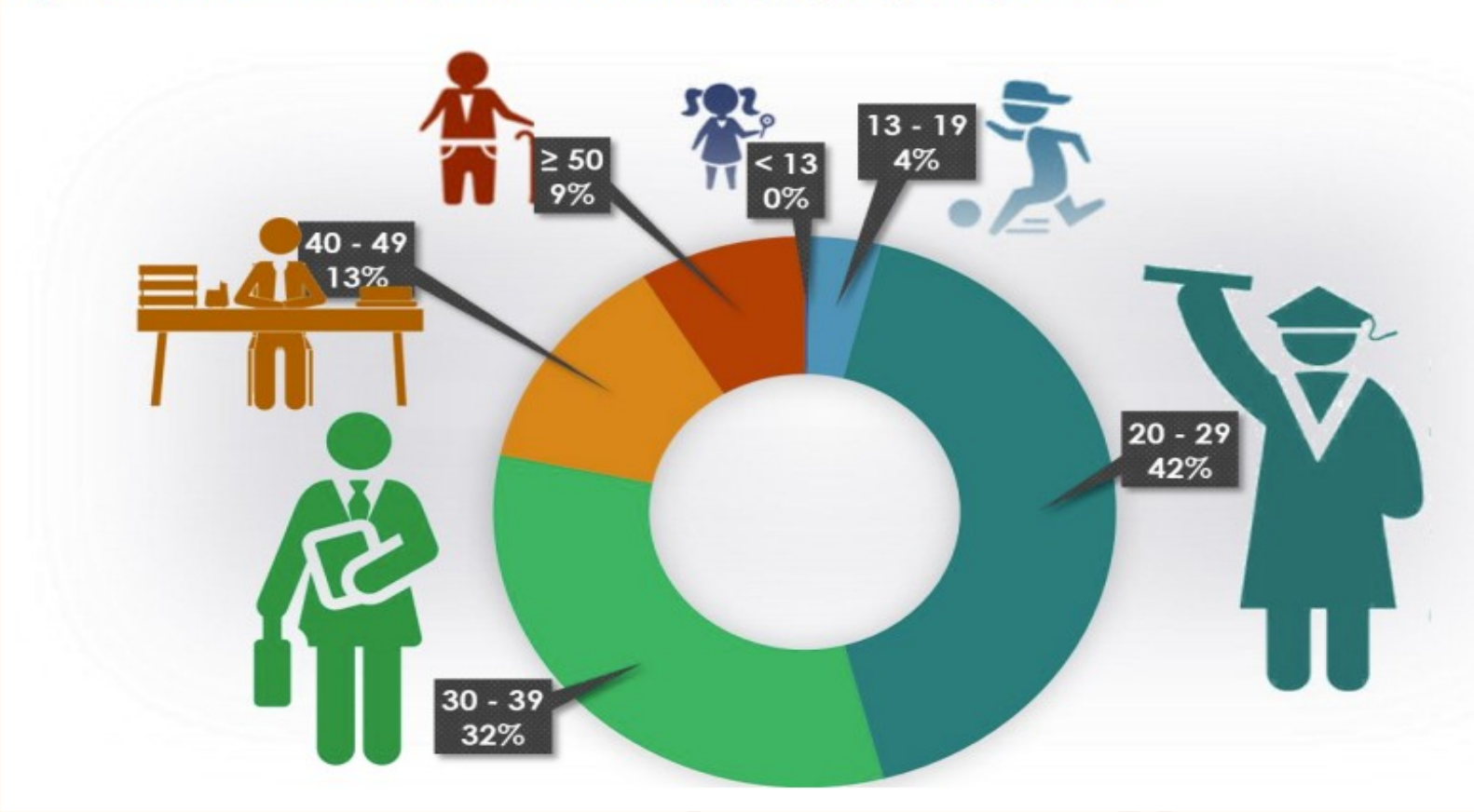


**Figure 17 Percentage of pregnant women living with HIV who received antiretroviral medicine to reduce the risk of mother-to-child transmission of HIV**




Source: Spectrum file Malaysia AEM-Spectrum 2023

**Figure 8: Distribution of reported HIV cases by age group, Malaysia 2022**



02

# TRANSMISSION

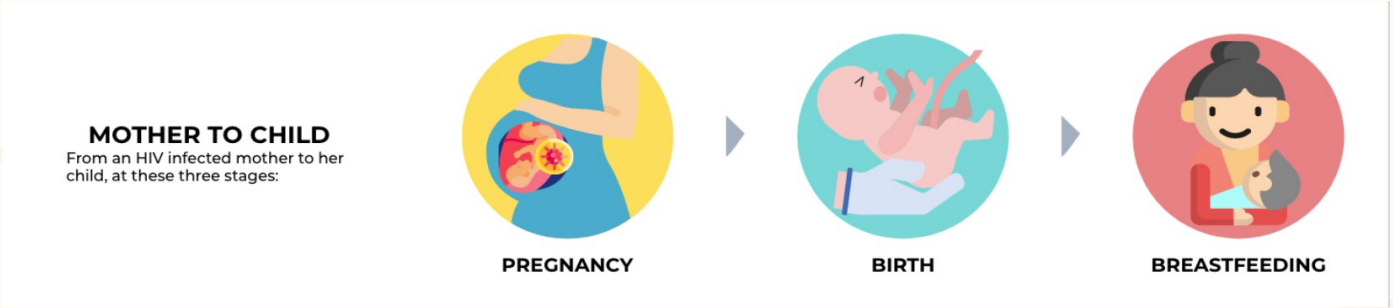
# Transmission of HIV to Children:

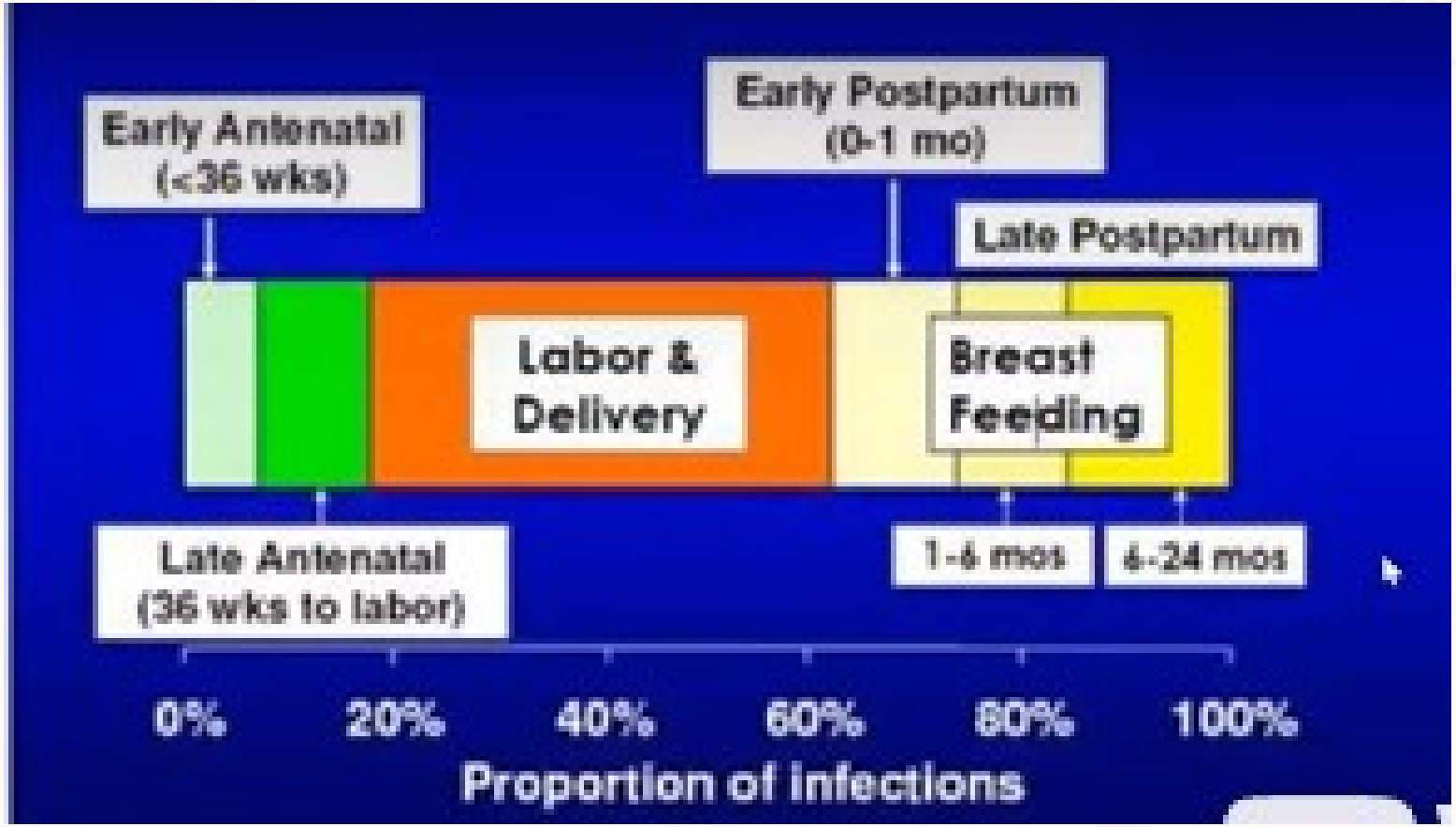
## 1. Vertical transmission: > 90%

- During pregnancy, at delivery (50%), BF (33%)
- Risk of vertical transmission: 25~30%
- BF confers additional 14% risk, therefore contraindicated

2. Blood product transfusion

3. Sexual abuse




Early Antenatal
(<36 wks)
Early Postpartum
(0-1 mo)
Late Postpartum
Labor &
Delivery
Breast
Feeding
Late Antenatal
(36 wks to labor)
1-6 mos
6-24 mos
0%
20%
40%
60%
80%
100%
Proportion of infections

## Factors associated with higher transmission rate

*Maternal*

- Low CD 4 counts
- High viral load
- Advanced disease
- Seroconversion during pregnancy

*Foetal*

- Premature delivery of the baby
- Delivery and procedures
- Invasive procedures such as episiotomy
- Foetal scalp electrodes
- Foetal blood sampling and amniocentesis
- Vaginal delivery
- Rupture of membranes > 4 hours
- Chorioamnionitis

**Transmission rate not increased if maternal viral load fully suppressed*

# Interventions to reduce vertical transmission:

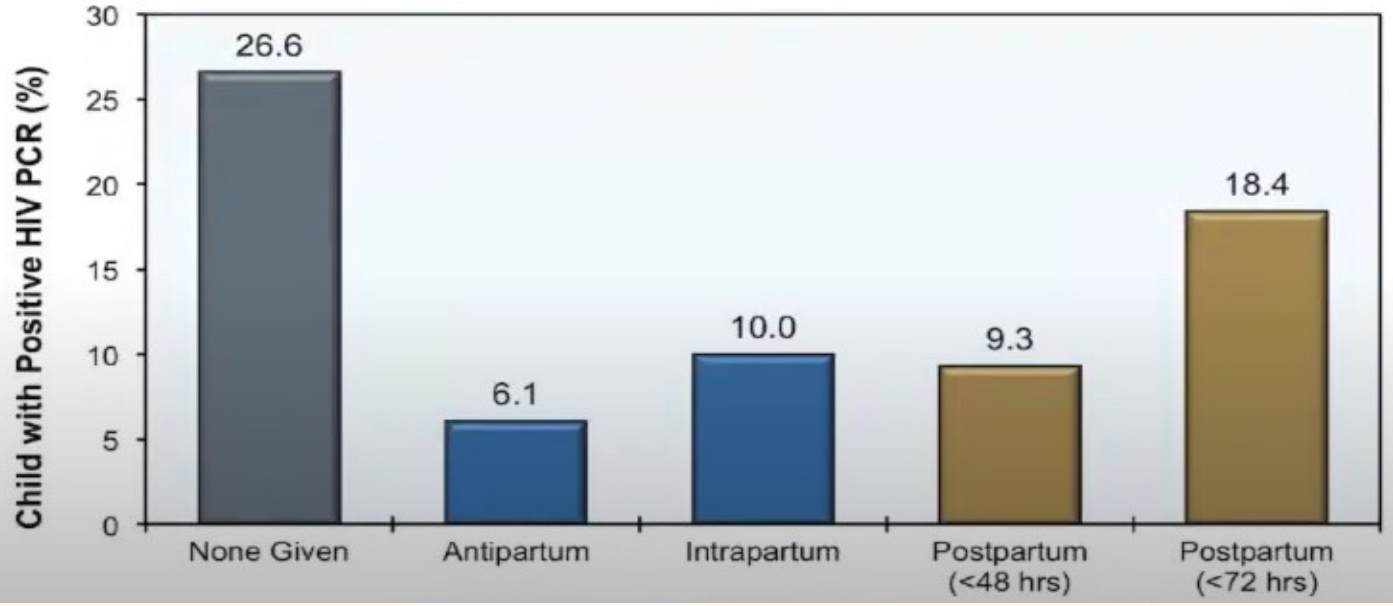
1. Screening & early detection in pregnant women/high risk group

2. **Maternal ART-** Initiate ART ASAP once HIV diagnosed to achieve viral suppression

3. **Infant postnatal prophylaxis**
    - Substitution of BF with infant formula

# Timing of ARV prophylaxis and MTCT

Source: Wade NA, Birkhead GS, Warren BL, et al. Abbreviated regimens of zidovudine prophylaxis and perinatal transmission of the human immunodeficiency virus. N Engl J Med. 1998;339:1409-14.



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# DIAGNOSIS

## Infant born to HIV infected mother, what to do?

## Is the infant infected?

- MOST infant are well & asymptomatic at birth.
- All will have acquired maternal Ab; interfere with HIV ELISA Ab test
- Maternal Ab persist up to 18 months of age.

## Diagnosis: Infants < 18 months:

- Dx need to be confirm by virologic test: HIV DNA/RNA PCR (IMR)
  0-2 week (do not use cord blood)
  6 weeks
  4-6 months

  * Can detect very early infection just days or weeks after exposure

- If PCR positive, repeat ASAP; Dx confirmed with 2 positive PCR taken at separate date

## Infection excluded if:

- All 3 PCR negative
- Ab negative (seroconversion 12-18mth)
- Asymptomatic

HIV DNA PCR testing:

- Sensitivity: 55% at birth; >90% by 2-4 wk of age & 100% at 3 &6mth.
- Specificity: 99.8% at birth & 100% at 1,3, & 6mth.

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# MANAGEMENT & FOLLOW UP

## 1. Before delivery

Antenatal counselling:

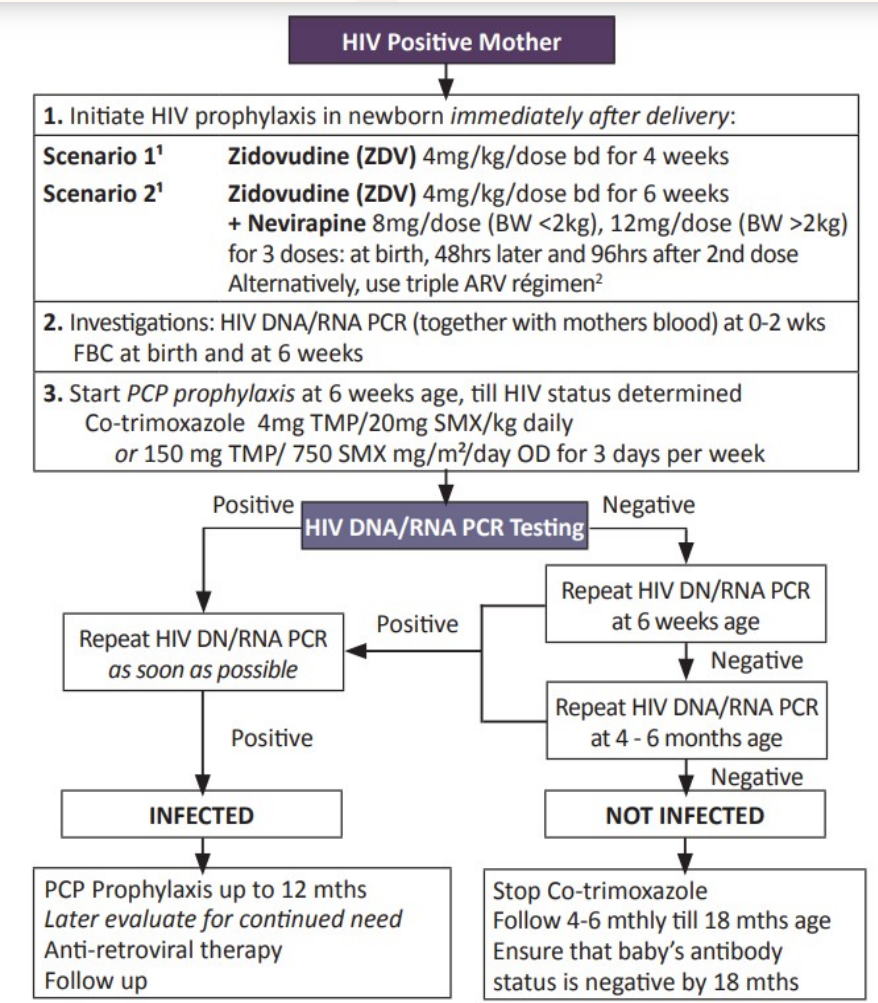
- transmission rate (without intervention) up to 40%
- ARV prophylaxis ± elective LSCS reduces transmission to ~2%
- BF double the risk of transmission, advice exclusive infant formula feeding.
- Difficulty in making early Dx because of presence of maternal Ab. Stress importance of regular blood tests & f/u.

## 2. During delivery

- Standard precautions at all times.
- Use protective barriers
- All equipment should be cleaned and sterilized.
- The placenta should be dispose according to standard universal precaution in hospital.

# 3. After delivery

- Admit to SCN/NICU, thorough maternal history & NB examination
- **ALL infants start on prophylaxis ART ASAP**: syrup zidovudine ± nevirapine within 6-12h of delivery (not > 48h)
- Examine for evidence of other congenital infections, signs of drug withdrawal
- Blood Ix:
  - HIV DNA/RNA PCR
  - FBC, RP, LFT
  - HbsAg, Hepatitis C, TORCHES as indicated




** **Scenario 1**: **Low risk**: Infant of HIV infected mother who is on ART & has sustained viral suppression (VL : undetectable/< 50copies/ml)
** **Scenario 2**: **High risk**: infant born to HIV infected mother who:

- Not received intrapartum/antepartum ARV
- Received only intrapartum ARV
- Received antepartum ARV but does not have viral suppression near delivery

** Triple ARV: ZDV/Lamivudine/Nevirapine

Dose of ZDV for preterm:
* **PT < 30 wk**: 2mg/kg 12 hourly from birth-4 wk, then 3mg/kg 12 hourly age 4-6 wk
* **> 30 wk**: 2mg/kg 12 hourly from birth-2 wk, then 3mg/kg 12 hourly 2-6wk

- If Oral feeding contraindicated, use IV ZDV 1.5mg/kg/dose

# Follow UP:

- Review at 2wk, 6wk then every 2~3 monthly
- Look for drug intolerance/adverse effect, S&S of HIV infection
    - AZT (NRTI): transient anaemia, neutropenia
    - Nevirapine (NNRTI): rash , hepatoxicity (rare in infant)
- Do FBC at 2 & 6 wk (while on AZT)
- Take HIV PCR at 2wk, 6 wk, 4-6 mth
- Stop ARV prophylaxis at 4/6 wk & start Bactrim prophylaxis for PCP
- Bactrim usually can be stopped by 4mth of age when received at least 2 negative PCR results
- If all HIV PCR negative, f/u 6 monthly
- Repeat HIV ELISA at 18 mth. If negative, f/u yearly at local health clinic till school age.

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# FEEDING PRACTICE

- BF contributes to a substantial proportion of new infant HIV infections.
- Risk of vertical transmission are higher among BF infant (14-16%), highest in early months of the infant's life
- **Mechanism of breast milk transmission** not fully elucidated, may include the intestine or tonsillar tissues
- BF transmission of HIV defined as infant HIV infection detected at 1 month of life or later following a negative HIV virologic test.

**Risk factors for HIV transmission through breast milk**

- Maternal HIV viral load
- Acute vs chronic HIV infection
- Maternal immunologic factors: immunosuppressed with low CD4 count
- Maternal presence of HIV drug resistance
- Breast infections
- Feeding pattern

a) All infant born to HIV infected mother in Malaysia: **advised exclusive infant formula feeding**

b) MOH provide free infant formula for those eligible up to 24 months

c) Educate mother/caregiver on proper preparation of infant formula

d) Ensure Lactation Suppression Therapy provided

Mother who insisted on BF and fulfil the following criteria should be assisted:

i. Referred to paediatrician prior allowed to BF.

ii. Mother have no infection at the breast

iii. Mother has viral load consistently < 50 copies / ml

iv. Monitor HIV PCR of the child monthly until BF stopped

v. Exclusive BF is highly recommended. Mixed feeding increase risk of transmission.

## Infant antiretroviral prophylaxis regimens based on risk and type of feeding

| | Breastfeeding | Replacement feeding |
|---|---|---|
| **High-risk infant** | ▪ Zidovudine twice daily for 6 weeks<br>PLUS<br>Nevirapine once daily for 6 weeks<br><br>FOLLOWED BY<br>One of the following:<br>▪ Same regimen as above for an additional 6 weeks*<br>OR<br>▪ Nevirapine once daily for an additional 6 weeks* | ▪ Zidovudine twice daily for 6 weeks<br>PLUS<br>Nevirapine once daily for 6 weeks |
| **Low-risk infant** | ▪ Nevirapine once daily for 6 weeks | ▪ Nevirapine once daily for 4 to 6 weeks<br>OR<br>▪ Zidovudine twice daily for 4 to 6 weeks |

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# IMMUNISATION

- Generally well tolerated
- Vaccines protect HIV-infected children from getting severe vaccine-preventable diseases
- All routine vaccinations can be given according to schedule, with special precautions for live vaccines
    - BCG
    - MMR
    - VZ vaccine if affordable, 2 doses with 2 mth interval
- Despite vaccination, long term protection may not be achieve in severe immune suppression

## Immunization

| Vaccine | Asymptomatic | Symptomatic |
|---|---|---|
| BCG | Yes | No |
| Hep B | Yes | Yes |
| DPT/Hib | Yes | Yes |
| OPV | No | No |
| IPV | Yes | Yes |
| MMR | Yes | No* |
| PCV | YES | YES |

* Immunosuppressed : CD4 < 15%

# Case scenario:

Referral from private paediatrician for initiation of zidovudine for an infant:
Day 7 of life, term baby
Born to an Indonesian mother, unbooked and unscreened
HIV screening taken at delivery came back as positive

**What to do?**

- notify
- refer to hospital, contact screening

**Should start Zidovudine?**

- NO

**Learning point?**

- HIV rapid test

# CONCLUSION

- Maternal Viral Load- most important risk factor for vertical transmission
- ALL INFANTS born to HIV infected mother should received ARV prophylaxis ASAP

# THANK YOU !

Any questions?