

# Case 3

## *BA,RI*

- 30 y/o African male Ghana
- Immigration detention centre NSW
- Heterosexual
- Exposure FSW 1 year ago
- Currently 1° syphilis
- Recurrent episodes malaria – treated as outpatient several times over last few years

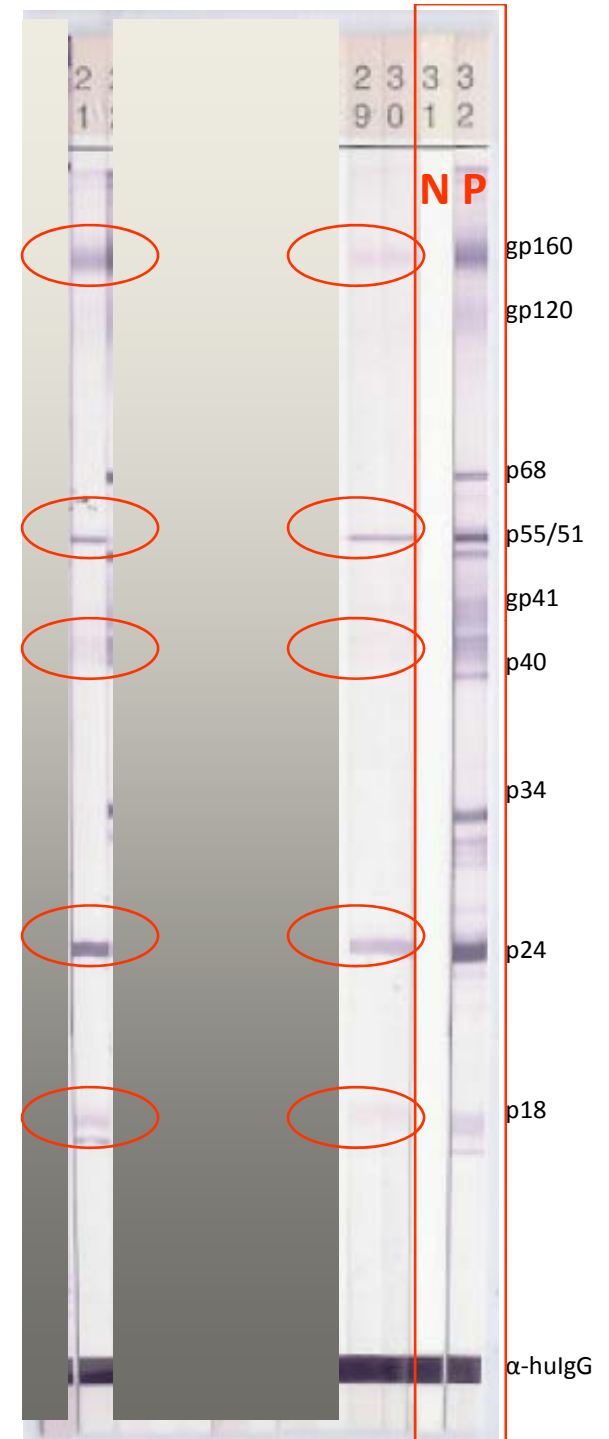
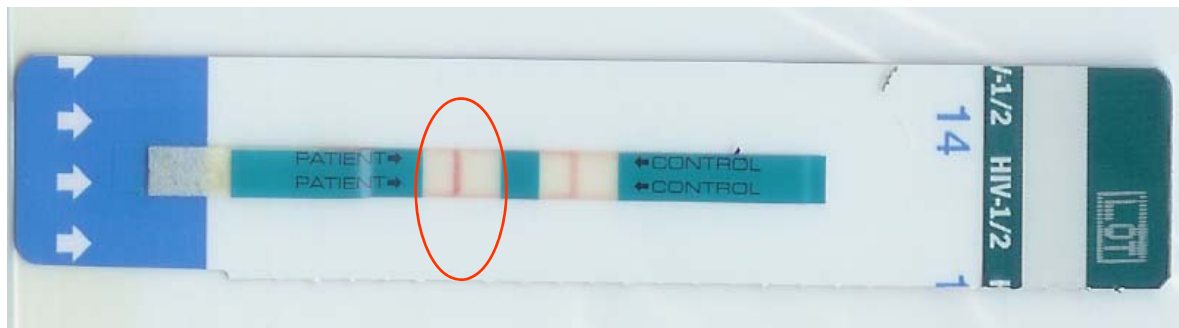
# BA,RI

## HIV serology

- HIV-1/2 Ab/Ag 4<sup>th</sup> gen EIA – reactive
- HIV-1/2 3<sup>rd</sup> generation EIA - reactive
- HIV-1/2 rapid test (X2) – reactive
- HIV-1 western blot – POSITIVE

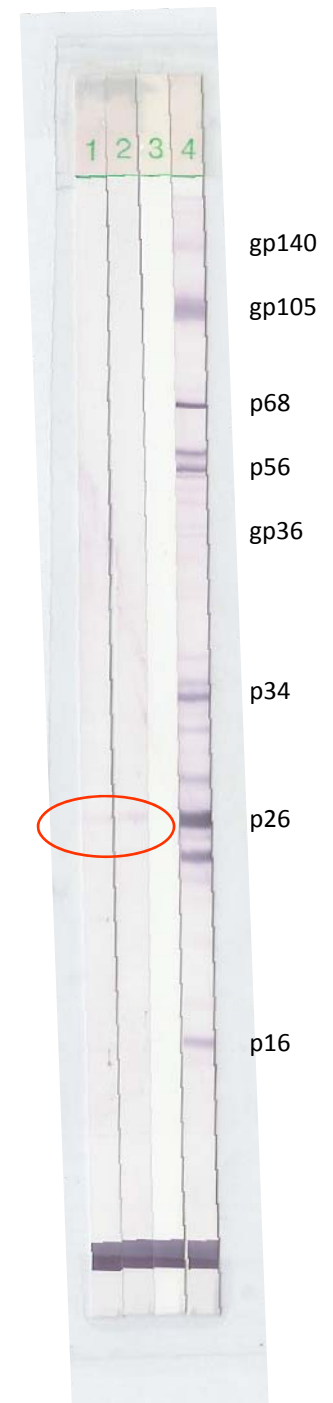
## HIV direct detection

- HIV-1 p24 antigen – not detected
- HIV proviral DNA PCR – not detected
- HIV RNA (*gag*) – PCR – not detected



# What next?

- Follow up sample and detailed history!
- HIV serology testing strategies
  - Supplementary EIAs
- CD4 lymphocyte count
  - 480 (normal)
- HIV-2 serology
  - Negative to specific gp 36 antigens
- HIV RNA (*pol*)
  - Not detected by bDNA RNA test
- HIV culture - virus isolation
  - CD8 depleted, IL2 enriched, PHA stimulated PBMC co-culture



# Malaria ??

- Subtype O (outlier) HIV-1
- Unknown HIV-1 strain
- Profound biological false positive (BFP) HIV-1 serology
  - Malaria, syphilis, hyper IgG, immune stimulation,
  - Issues in HIV-1 testing strategies in malaria endemic areas

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False-Positive Results of Enzyme Immunoassays for Human Immunodeficiency Virus in Patients with Uncomplicated Malaria  
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Malaria may impact upon human immunodeficiency virus (HIV) test results. We evaluated two HIV enzyme immunoassays (EIAs) by testing 1,965 Ugandans with malaria. We found poor positive predictive values (53% and 76%), particularly with younger age. Combining EIAs eliminated false positives but missed 21% of true positives. Performance of HIV EIAs in malaria may be unsatisfactory.

EGIS-15IAC: False-positive HIV serological tests in acute malaria patients in Ethiopia. Page 1 of 1

VIEW IN FRAME

 15th International AIDS Conference  
Bangkok, Thailand - July 11-16, 2004

False-positive HIV serological tests in acute malaria patients in Ethiopia.

Int Conf AIDS 2004 Jul 11-16; 15:(abstract no. B12068)

Kassu D, Petros B, Mesele T, Tiinhun T, Mekonnen T, Meless H, Wolday D  
EHNRI, Addis Ababa, Ethiopia

**BACKGROUND:** We were assessing the possible association of malaria and HIV infections at Wonji Sugar Estate.

**METHODS:** Malaria parasites were detected using light Microscopy. Anti-HIV antibodies were tested using rapid tests, HIV spot and Determine HIV-1/2. Seropositive results were confirmed by ELISA and Western Blot (WB).

**RESULTS:** 166 malaria patients were included in the study. Out of these 166 plasma samples 107 were tested by Determine HIV-1/2 and 8 (7.5%) were HIV positives while 2 (1.9%) give invalid results. However, out of these 8 seropositives, only 4 were confirmed to be HIV positives by both ELISA and WB, while the remaining 4 were HIV negative by ELISA but indeterminate by WB. Serostatus of the remaining 59 plasma samples were tested by HIV spot, and 3 (5.1%) were seropositives. However, all these three seropositive samples were confirmed to be seropositive by both ELISA and WB. Furthermore, 56 plasma samples, which had been seronegative by HIV spot, were further re-tested by Determine HIV-1/2 and 3 (5.4%) were found to be HIV positives. However, out of these 3 HIV positives, 2 of them were negative by ELISA and indeterminate by WB, but one sample was still positive by both ELISA and WB. Moreover, when 4 plasma samples, which were positive by Determine HIV-1/2, but negative by ELISA and indeterminate by WB were re-tested by Uni-Gold test, three of them were weak HIV positive but one was negative. Furthermore, when we re-test 4 other samples, which were positive by Determine HIV-1/2, but negative by ELISA and indeterminate by WB, by PCR (which detects HIV-1 DNA), all of them were seronegatives.

**CONCLUSION:** While rapid HIV tests Determine HIV-1/2 and Uni-Gold give false positive, HIV spot gives false negatives during acute malaria infections. WB on the other hand gives indeterminate results. Thus, this study suggests Determine HIV-1/2 and Uni-Gold rapid tests should be interpreted with great caution in malaria endemic areas. Moreover, the application of WB as confirmatory test in malaria endemic areas should also be

# *Cercopithecus mona* – Mona monkey



# Case 2

*Blood donor - ID4373565*

- HIV-1/2 Ab/Ag 4<sup>th</sup> gen Architect duplicate: 275/277 S/CO
- HIV-1/2 3<sup>rd</sup> generation Ab : Positive
- HIV-1 p24 Ag: Not detected
- WB: 18+24+34+gp41+53+55+66+gp120+gp160+ (pos)
- HIV-1/HIV 2 differential cartridge test: HIV-1
  
- Novartis HIV RNA pooled (n=16) not detected
- Novartis HIV RNA single - S/CO 2.63 (low)
- Roche HIV RNA – not detected

# Case 3 - Patient History

- 37 year old male
- Born in Ghana, Africa
- Malarial infection as an infant
- Blood transfusion in ~1974
- Migrated to UK as an infant
- Multiple partners in UK and Australia
- Asymptomatic and good health at diagnosis

## Results - First Line Screening

<b>ASSAY</b>	<b>SAMPLE ONE</b>	<b>SAMPLE TWO</b>
Abbott Architect HIV Ag/Ab Combo Screen	Reactive	Reactive

## Results - Second Line Confirmation

<b>ASSAY</b>	<b>SAMPLE ONE</b>	<b>SAMPLE TWO</b>
BioRad Genscreen HIV 1/2 Assay	Reactive	Reactive
BioRad Genscreen HIV-1 Ag Assay	Non Reactive	Non Reactive



# Results - Western Blot



gp160	+
gp120	+/-
p68	++
p55	+/-
p53	-
gp41-45	+/-
p40	-
p34	+++
p24	+/-
p18	+/-



gp160	+
gp120	-
p68	++
p55	+/-
p53	-
gp41-45	-
p40	-
p34	+++
p24	-
p18	+/-

## Results – Second Line Confirmation

<b>ASSAY</b>	<b>SAMPLE ONE</b>	<b>SAMPLE TWO</b>
Roche Amplicor HIV-1 DNA Test v. 1.5	Borderline Positive	N/A

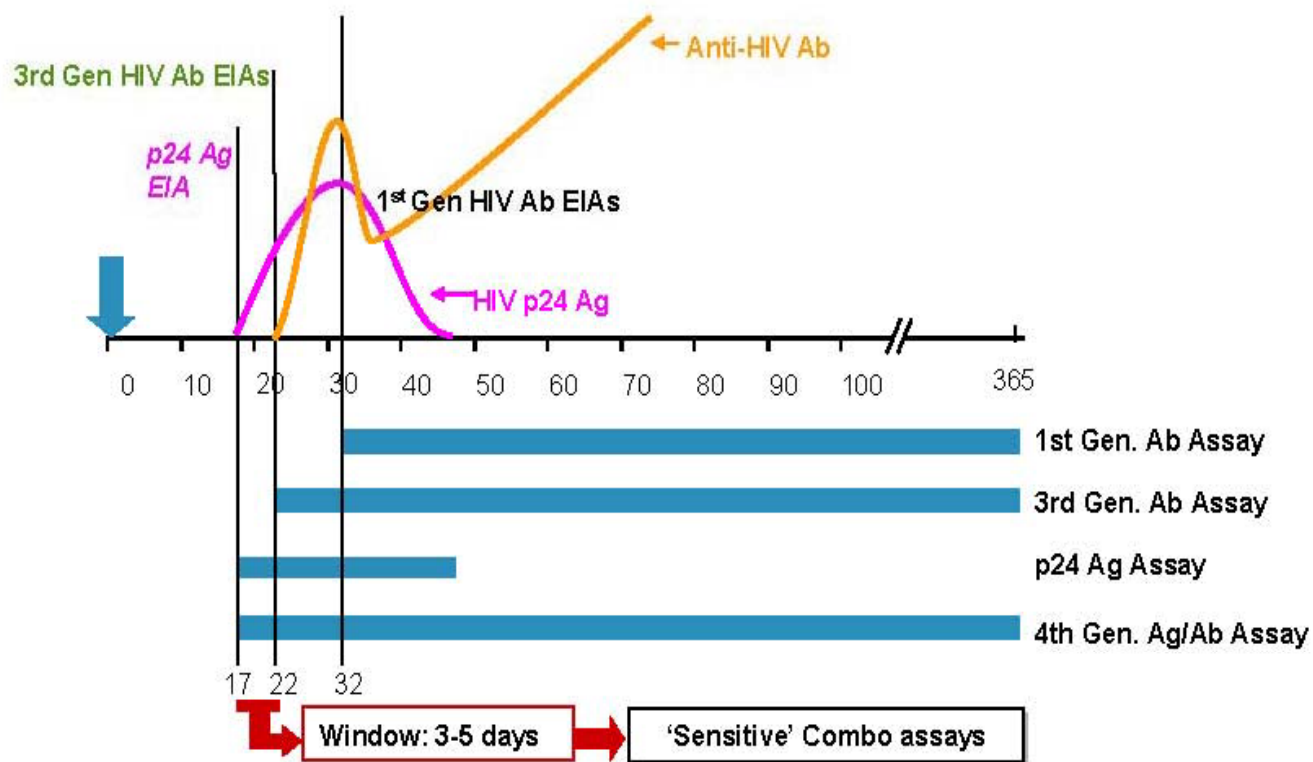
## Results – Supplementary

<b>ASSAY</b>	<b>SAMPLE ONE</b>	<b>SAMPLE TWO</b>
BioRad Multispot HIV-1/HIV-2 Rapid Test	HIV Undifferentiated (initial) HIV-2 (1/100)	HIV Undifferentiated (initial) HIV -2 (1/100)

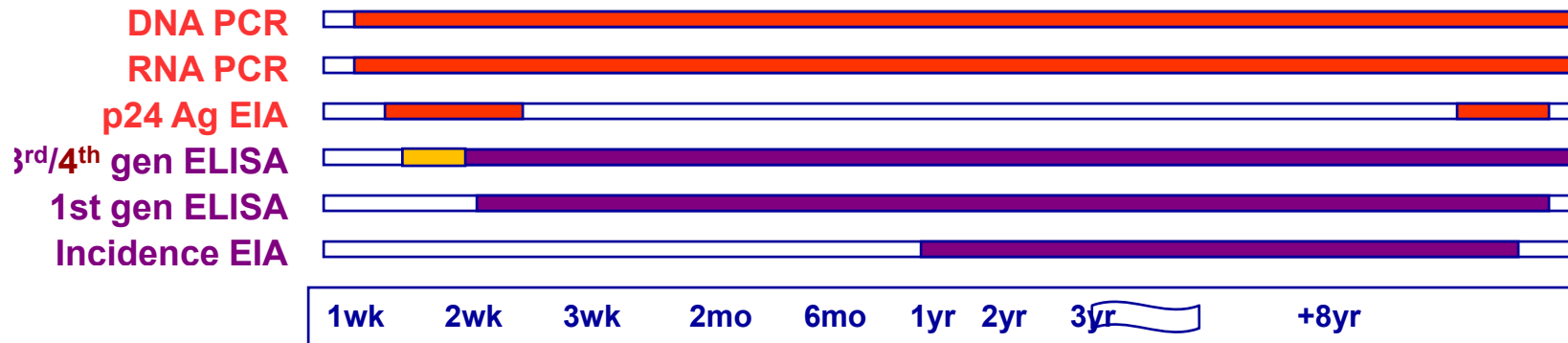
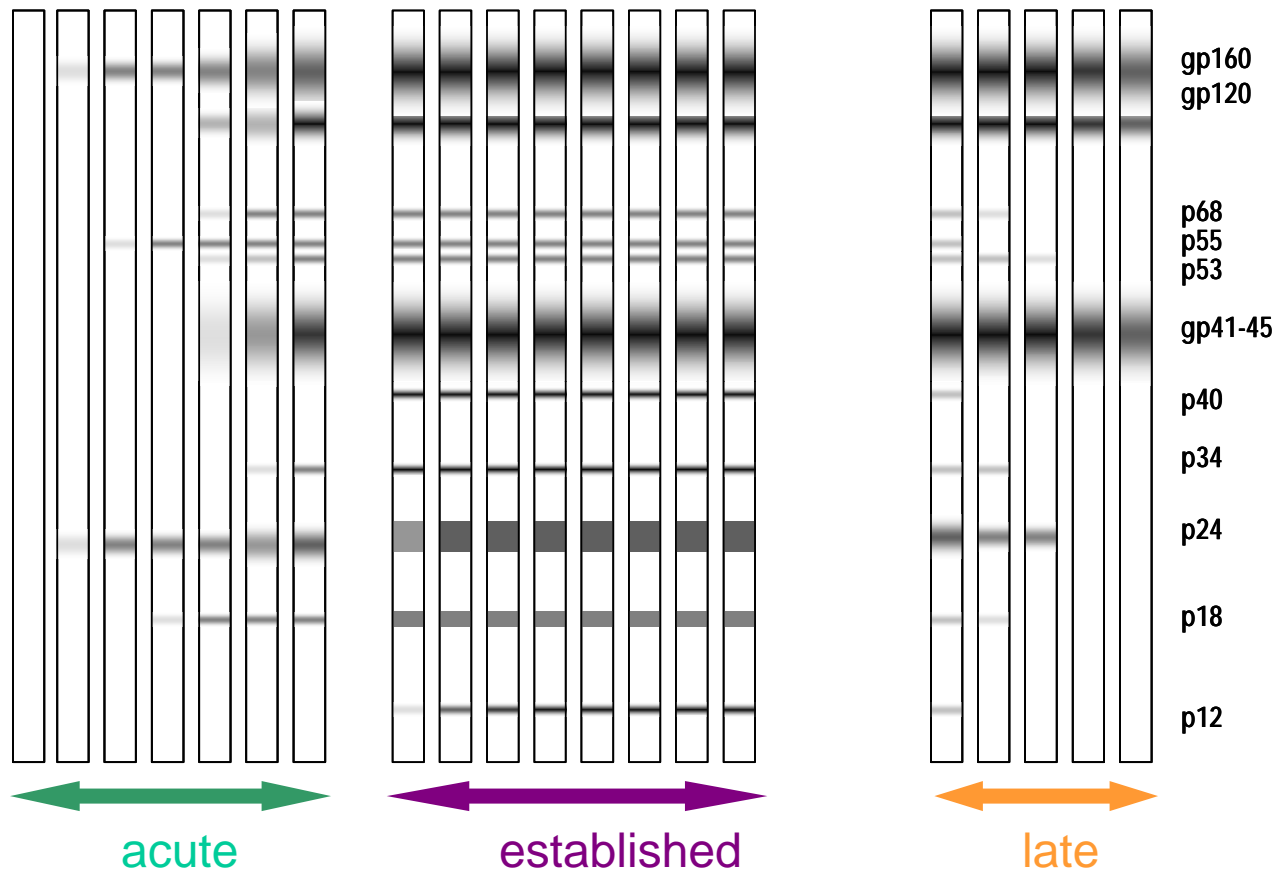
# Results - Monitoring

<b>ASSAY</b>	<b>SAMPLE ONE</b>	<b>SAMPLE TWO</b>
Roche Amplicor HIV-1 RNA Test v. 1.5	N/A	2900 cpy/mL
Drug Resistance Genotype	N/A	Unable to determine
CD4%	N/A	3% (R.R. 30-57%)

# Serological diagnosis of HIV infection

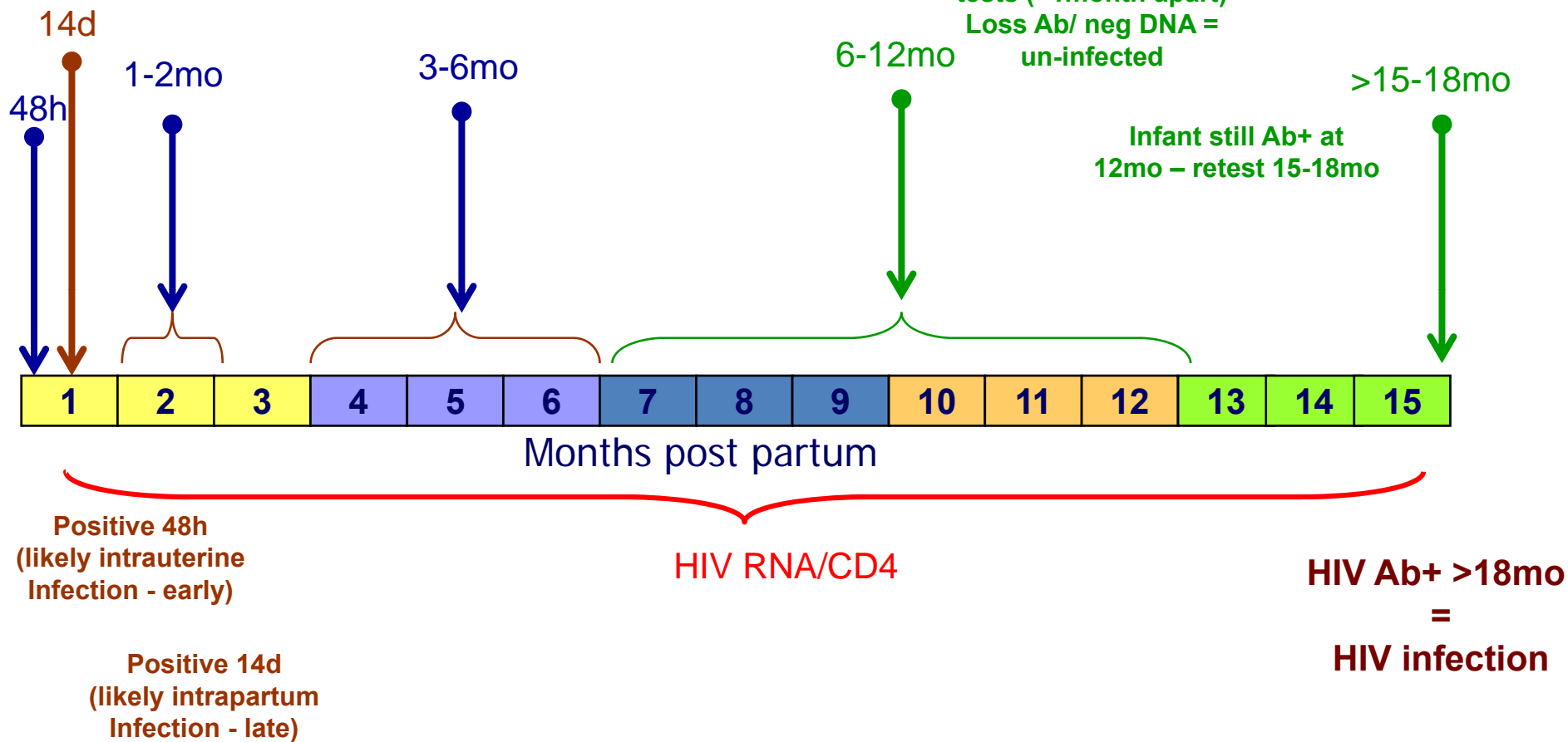


Adapted from: Fiebig *et al* AIDS 2003; 17:1871



HIV infection reasonably excluded in non-breast fed infant if negative in 2 or more  $\geq 1$  month and  $\geq 4$  months

>2 negative HIV Ab tests (<1 month apart)  
Loss Ab/ neg DNA = un-infected



? consider  
cease ZDV px  
aggressive ARV