

SECTION 2: ANTIRETROVIRAL TREATMENT (ART) IN CHILDREN

Diagnosing HIV infection in children

At present, the majority of children are diagnosed on the basis of symptomatic HIV disease and the positive HIV antibody test of the mother of the child. The child of an HIV-infected mother acquires HIV antibodies from his/her mother during pregnancy. These may persist in his or her blood until 15-18 months of age, even if the child is not infected with HIV. Thus a child may test HIV positive without actually being infected.

Therefore, when using the HIV antibody test, it is not possible to tell whether a newborn infant has already been infected with HIV.

Additional techniques exist for the detection of virus in children under 18 months. HIV infection can be diagnosed in most infected infants by the age 6 weeks by using DNA PCR technique.

Testing for HIV should only be done after the following:

- Pre-test counselling has been provided to the parent(s) or legal guardian.
- Informed consent is obtained from the parent(s) or legal guardian.

Post-test counselling should be provided once results are available.

Figure 6, page 28, offers assistance in deciding when to test a child, based on the mother's HIV status.

Rapid HIV testing may be less reliable in children than in adults. **Rapid HIV tests should not routinely be performed in children.**

N.B.

Remember: Be careful not to mislabel a child by assigning an HIV-positive status to the child if the mother is HIV positive. The correct term to use is HIV-EXPOSED. Also, no child should be labelled HIV-positive based on an HIV ELISA under 18 months of age.

HIV diagnostic protocol for abandoned infants 6 weeks of age

- Perform an HIV ELISA to assess HIV-exposure at birth (omit if the HIV ELISA of the mother is confirmed positive).
- If HIV antibody of mother or infant is positive, perform HIV DNA PCR.

3 months of age

- Repeat HIV DNA PCR to confirm 6-week result (omit if HIV ELISA was negative).

N.B.

- **A clinical examination to assess for signs and symptoms of HIV infection should be performed during all visits, and especially at 6 weeks and 3 months of age. The infant should thereafter be followed up as per recommendations for all children (see above).**
- **Postnatal transmission of HIV infection is likely to be evident by 6 weeks after termination of breast-feeding. However it is recommended that the final qualitative HIV PCR test on abandoned infants be performed 3 months after breast-feeding has ceased.**

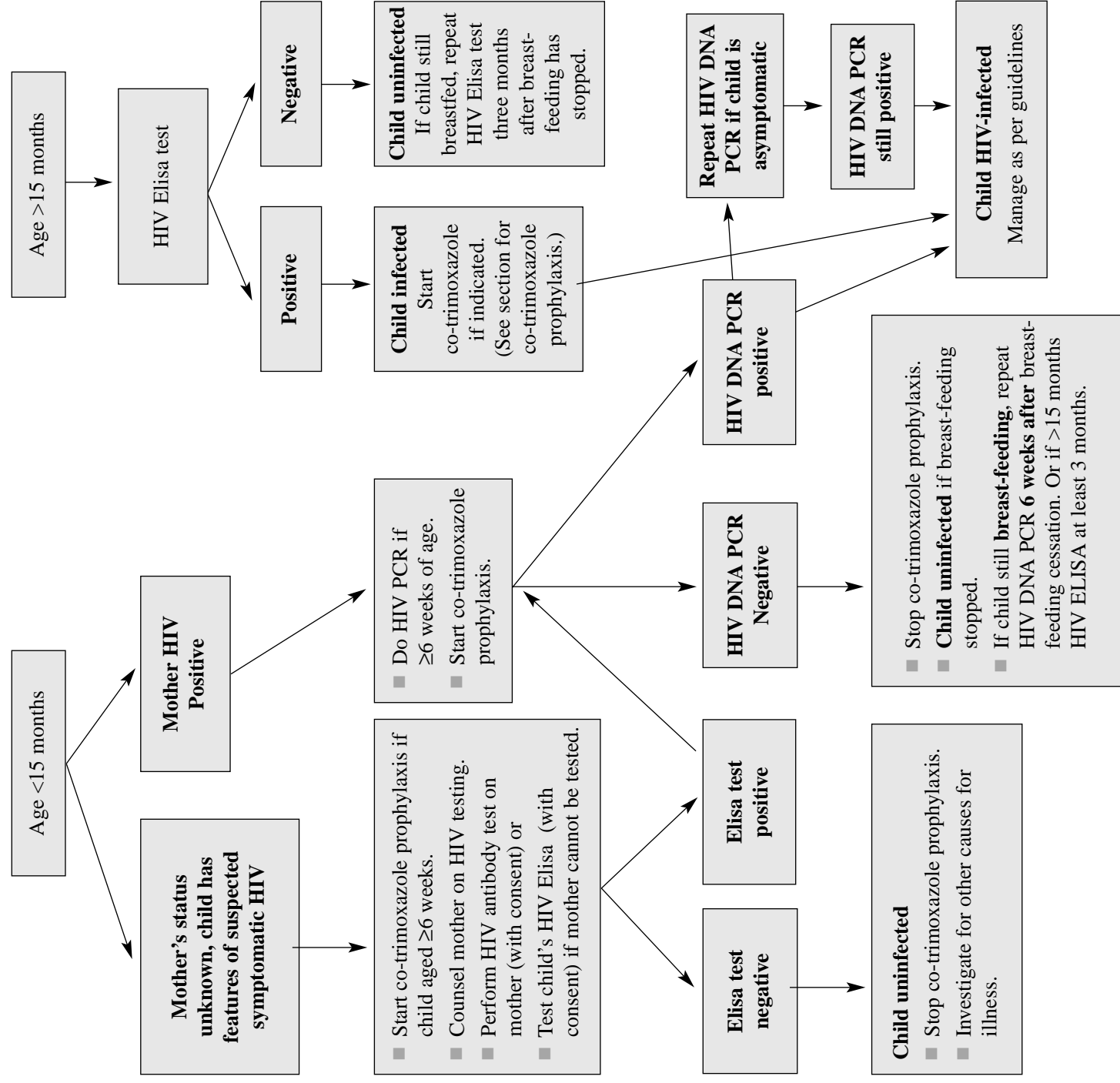
Goals of antiretroviral treatment

The goal of ART for children is to increase survival, and to decrease HIV-related morbidity and mortality.

- The child's CD4 count should rise and remain above the baseline count.
- The child's viral load should become undetectable (<400 copies/mm³) and remain undetectable on ART.
- In some children, a suppressed though detectable viral load, with sustained elevation in CD4 count and absence of intercurrent and/or opportunistic infection, may be the best achievable goal.

Initially ART delivery will occur at higher levels of health care, and will be doctor-initiated as this is where expertise exists currently. However, as the programme expands, provision of this treatment will occur at all levels by doctors and nurses.

Figure 6: HIV testing guidelines in children



N.B.

- Contact laboratory if the results are inconsistent.
- PCR testing may not be available immediately at all centres.
- All children, regardless of exposure to HIV infection and of HIV status should be followed up monthly in the first year of life, and 3 months thereafter till the age of 5 years (according to IMCI and WHO guidelines for management of children).

Selection of patients for antiretroviral treatment

Criteria for commencing ART in children

Children being considered for ART will need to meet both medical and psycho-social criteria before starting therapy.

Medical criteria:

- Recurrent hospitalisations (>2 admissions per year) for HIV-related disease, or prolonged hospitalisation (>4 weeks)

OR

- Modified WHO Stage II or III disease

OR

- CD4 percentage <20% in a child under 18 months old, irrespective of disease stage

OR

- CD4 percentage <15% in a child over 18 months old, irrespective of disease stage.

(See Appendix 2 for Modified WHO Staging, page 80)

Psycho-social considerations (not exclusion criteria)

These factors are extremely important for the success of the programme, and need to be adhered to. The principle is that adherence must be at least probable.

- An identifiable adult who is able to administer medication (all efforts should be made to ensure that the social circumstances of vulnerable children, e.g. orphans, are addressed so that they too can receive treatment.
- Demonstrated reliability in the adult caregiver i.e. has attended three or more scheduled visits to the service point and the immunisation record of child is up-to-date.
- Supportive social environment as for adults (see adult section).
- Disclosure to another adult living in the same house is encouraged so that there is someone else who can assist with the child's ART.

Previous record of adherence to nutritional supplements or other chronic care regimens, such as TB drugs, may help to identify children who are at risk of poor adherence. The patient and caregiver have to be able to attend the antiretroviral centre on a regular basis. Transport may need to be arranged for patients in rural areas or for those remote from the treatment site.

Treatment of mothers, caregivers and other family members

- Always ask about the caregiver's health, and the health of other members of the family.
- Ensure that mothers and other family members have access to medical care when necessary, including ART if needed.

Process for initiation of antiretroviral treatment

Induction schedule

First screening visit 2 – 4 weeks before starting ART

When the child arrives with the referral letter:

- Complete the history and clinical evaluation, including weight and height.
- Update growth chart.
- Calculate surface area: $BSA = \sqrt{\frac{Hgt(cm) \times Wgt(kg)}{3600}} \text{ m}^2$
(see paediatric dosing schedule – Appendix 3, page 82).
- Ensure that TB is adequately excluded:
 - History of TB contact
 - Chest radiograph (CXR)
 - Gastric aspirates or induced sputum if abnormal CXR
 - Mantoux test if child is less than 5 years
 - Abdominal ultrasound (if clinically indicated and possible) for lymphadenopathy

- Name the caregiver responsible for medication, and make sure that this person is present during all discussions regarding ART.
- Explain the importance of adherence, as well as tools to help improve adherence. These include the use of pillboxes, syringes, diary cards. They should also bring back all empty containers and unused drugs at all follow-up visits.
- Explain the side-effects of ART with emphasis on problems associated with the chosen drug regimen.
- Exact drug schedule for the child must be explained to the guardian.
- Do baseline investigations according to Table 13, page 47.

In the meantime the treatment counsellor will visit the patient at home to assess:

- Home circumstances
- Correctness of the contact details
- Support structures including disclosure
- Drug storage facilities

Before the second visit the multi-disciplinary team should meet and assess patient readiness (taking all available information into account).

Second Visit

- Clinical and biological assessment
- Information and education session
- Adherence counselling to caregiver

Multi-disciplinary team discussion

Children who do not meet the treatment readiness criteria should be referred back to their local clinic with a detailed letter. This should include reason for deferment of ART and possible solutions to enable treatment uptake at a later stage.

Treatment Initiation Visit 1

- Complete history and clinical evaluation including weight and height.
- Update growth chart.
- Calculate surface area: $BSA = \sqrt{\frac{Hgt(cm) \times Wgt(kg)}{3600}} \text{ m}^2$
(see paediatric dosing schedule – Appendix 3, page 82).
- Check baseline blood results (taken at first screening visit).
- Explain the importance of adherence and illustrate tools to help improve adherence. This could include the use of pill boxes, syringes, diary cards, as well as the bringing back of all empty containers and unused drugs to all follow-up visits where feasible.
- Explain possible side-effects of ART with emphasis on the problems associated with the chosen drug regimen.
- Explain drug schedule for the child to the guardian, using the diary card.
- Commence ART.
- Prescribe medication for 2 weeks, calculating total volume of medicine and number of units required.
- Issue pillboxes, syringes and diary cards.
- Arrange adherence phone call in 1 week (if possible).
- Arrange follow-up visit after 2 weeks.

Antiretroviral treatment visits

Scheduled Visits

Treatment Visit 2 (2 weeks after therapy initiation)

- Complete history and clinical evaluation including weight and height.
- Update growth chart.
- Calculate surface area: $BSA \sqrt{\frac{Hgt(cm) \times Wgt(kg)}{3600}} \text{ m}^2$
(see paediatric dosing schedule – Appendix 3, page 82.)
- Adherence assessment (3 day recall).
- Reconcile returned empty containers with volume of medication prescribed for prior interval where feasible.
- Look for signs of toxicity (e.g. right upper quadrant tenderness, pallor, rash).
- Do safety investigations according to Table 13, page 47.
- Explain exact drug schedule for the child to the guardian, using the diary card.
- Issue medication for 2 weeks calculating total volume of medicine and number of units required.
- Issue pillboxes, syringes and diary cards where needed.
- Arrange follow-up visit after 2 weeks.

Treatment Visit 3 (4 weeks after initiation of treatment)

- Complete history and clinical evaluation including weight and height.
- Update growth chart.
- Calculate surface area: $BSA \sqrt{\frac{Hgt(cm) \times Wgt(kg)}{3600}} \text{ m}^2$
(see paediatric dosing schedule – Appendix 3, page 82).
- Adherence assessment (3 day recall).
- Reconcile returned empty containers with volume of medication prescribed for prior interval.
- Look for signs of toxicity (e.g. right upper quadrant tenderness, pallor, rash).
- Explain exact drug schedule for the child to the guardian, using diary card.
- Adjust drug schedule if needed (e.g. nevirapine).
- Do safety investigations according to Table 13, page 47.
- Issue medication for 4 weeks, calculating total volume of medicine and number of units required.
- Issue pill boxes, syringes and diary cards where needed.
- Arrange follow-up visit after 4 weeks.

Treatment Visit 4 (8 weeks after initiating therapy)

- Complete history and clinical evaluation including weight and height.
- Update growth chart.
- Calculate surface area: $BSA = \sqrt{\frac{Hgt(cm) \times Wgt(kg)}{3600}}$ m²
(see paediatric dosing schedule – Appendix 3, page 82).
- Adherence assessment.
- Reconcile returned empties with volume of drug issued at last visit.
- Look for signs of toxicity (e.g. right upper quadrant tenderness).
- Do safety investigations according to Table 13, page 47.
- Explain exact drug schedule for the child to the guardian.
- Issue medication for 4 weeks calculating total volume of medicine and number of units required.
- Enquire about full units of medication left over at home. Include these in assessment of adherence and calculation of number of units required for the next interval.
- Issue pillboxes, syringes and diary cards where needed.
- Arrange follow-up visit after 4 weeks.

Schedule following visits at monthly intervals

This is to collect medication until Week 12 of therapy. Collect medication monthly with 3-monthly visits for clinical evaluation, toxicity bloods as per schedule. If unwell, they may need to be seen more frequently to exclude adverse events, immune reconstitution, infection or treatment failure.

At each subsequent visit

- Repeat all the measures from Treatment Visit 4 above.
- When 3 monthly visits are initiated, make sure the guardian understands what it means to collect repeat medicines at monthly intervals until the next visit.
- At each visit, enquire about surplus units of medication at home. Include these in the calculation of volumes to be issued.

Recommended regimens in children

See Table 8, below and Table 9, page 40.

Paediatric first-line therapy – Regimen 1

Unless contra-indicated, all children will commence therapy on the regimen indicated in Table 8 below.

Table 8: Paediatric first-line therapy – Regimen 1

	6 months – 3 years	>3 years old and >10 kg
First-line	<ul style="list-style-type: none"> Stavudine (d4T) Lamivudine (3TC) Lopinavir/ritonavir 	<ul style="list-style-type: none"> Stavudine (d4T) Lamivudine (3TC) Efavirenz

General comments:

- All infants under 6 months of age who require treatment with ART should be started on treatment under specialist supervision.
- D4T solution require re Fridgeration. If no fridge is available, D4T capsules may be opened and dissolved, and the required amount administered to the child. The rest can be discarded.
- Nevirapine may be used in place of lopinavir/ritonavir if this has not been used to prevent mother-to-child transmission (PMTCT) of HIV.
- If nevirapine was used for PMTCT, one may consider using lopinavir/ritonavir in the first-line regimen for children under 3 years of age.
- Switch to tablets or capsules from syrups or solutions as soon as possible.
- Children may occasionally need to change a drug from the first-line regimen to one from the second-line regimen, because of intolerance or a serious adverse reaction. Swapping limits the patient's second-line treatment options. The decision to swap must be made by a doctor with antiretroviral experience.

- Lopinavir/ritonavir needs to be kept cool (<25 degrees Celsius).
- Didanosine must be taken alone, on an empty stomach, at least an hour before (or 2 hours after) a meal. Tablets should be dissolved in at least 30 ml of water. It is important to use 2 tablets of didanosine, e.g. if the child needs 100 mg prescribe 2 x 50 mg tablets.

Swapping drugs must be made by a doctor trained in ART.

N.B.

Ritonavir and lopinavir/ritonavir can be substituted by nevirapine in children <3 years with no prior nevirapine exposure. For children >3 years, efavirenz can be used as 3rd drug.

Immune reconstitution disease (IRD)

Definition:

Paradoxical clinical deterioration after starting ART, due to the improving immune system interacting with organisms that have colonised the body during the early stages of HIV infection.

It is important to differentiate immune reconstitution disease with treatment failure.

Causes:

A wide range of pathogens may induce IRD including *Mycobacterium tuberculosis* (MTB), *Mycobacterium avium complex*, *Mycobacterium leprae*, *Cryptococcus neoformans*, *Aspergillus fumigatus*, *Aspergillus terreus*, *Candida albicans*, *Pneumocystis carinii*, CMV, JC virus, Human Herpes viruses, Human Papilloma virus and hepatitis B and C viruses (HBV, HCV).

Presentation:

IRD usually presents during the first 6 weeks after starting ART. Clinical presentations vary and depend on the causative organism and the organ-system that is colonised. For example, IRD caused by MTB may present with:

- high fever
- lymphadenopathy
- worsening of the original tuberculous lesion, and / or deteriorating chest radiographic manifestations including the development of a military pattern or pleural effusion.

Management:

Includes specific antimicrobial therapy e.g. TB treatment for IRD caused by MTB. In severe reactions glucocorticosteroids and /or temporary discontinuation of ART may help.

Paediatric second-line therapy – Regimen 2

Procedure for introduction of second-line therapy:

- Do not rush into second-line therapy.
- First check adherence. If it is not possible to improve adherence, attempt directly observed therapy (DOT) with a health care worker or trusted 'other' family member or friend.
- Ensure second-line therapy does not include any drugs used in first-line therapy.

Before considering a move to second-line therapy, consult a paediatrician expert in ART.

Table 9: Reasons to move to second-line ART in children

Virological	Clinical	Immunological
<ul style="list-style-type: none"> Rebound of viral load to baseline. A detectable viral load may be tolerated in children, providing that growth and elevated CD4 count are sustained. 	<ul style="list-style-type: none"> Persistent oral thrush, which is refractory to treatment. New evidence of Stage III disease (not immune reconstitution disease – see below). <p>Note:</p> <ul style="list-style-type: none"> Short intercurrent episodes of pneumonia, lower respiratory tract infection (LRTI) and gastro-enteritis should not be regarded as clinical failure. Presentation with TB while on first-line therapy is NOT an indication to switch to second-line therapy, even though it can present as progression to Stage III disease. Immune reconstitution disease may present as a new Stage III event. However, this will usually be associated with a CD4 count and / or percentage which have improved over time. This is NOT an indication to switch to second-line therapy. 	<ul style="list-style-type: none"> A persistent decline in the CD4% over 2 months in the absence of TB. <p>Note:</p> <ul style="list-style-type: none"> The CD4% should NOT be measured during an intercurrent infection – but preferably a month post resolution. If there is a modest decline in CD4% (<5%), and if no failure to thrive, do not change medication, but monitor closely.

Table 10: Paediatric second-line therapy – Regimen 2

	6 months – 3 years	>3 years old and >10 kg
First-line	<ul style="list-style-type: none"> Zidovudine (AZT) DDI Nevirapine 	<ul style="list-style-type: none"> Zidovudine (AZT) DDI Lopinavir/ritonavir

Didanosine must be taken alone, on an empty stomach, at least an hour before (or 2 hours after) a meal. Tablets should be dissolved in at least 30 ml of water.

N.B.

For Regimen 2 where there has been prior exposure to nevirapine or efavirenz. Lopinavir/ritonavir can be substituted – as in Regimen 1.

Dosage of ART:

Provide antiretroviral dosages according to dosing table appendix 4. Paediatric doses apply to children who are prepubescent or in early puberty. Adult doses should be given to adolescents who are Tanner Stage 3-4. See Table 11 below.

Table 11: Tanner Staging of Puberty

Stage	Pubic Hair	Breasts
1	Pre-adolescent	Pre-adolescent
2	Sparse, lightly pigmented, straight, medial border labia	areast and papilla elevated as small mound; areola diameter increased
3	Darker, beginning to curl, increased amount	Breast and areola enlarged, no contour separation
4	Coarse, curly, abundant but less than adult	Areola and papilla form secondary mound
5	Adult feminine triangle, spread to medial surface of thighs	Mature; nipple projects, areola part of general breast contour

Table 12: Paediatric dosages per body surface area

Body surface (m ²)	Volume (ml) of each dose MORNING / 12hrs later	Volume (ml) of each dose MORNING / 12hrs later	Amount per dose MORNING / 12hrs later
	Zidovudine 10mg/mg syrup	Ritonavir 80mg/ml syrup	Didanosine 25,50, 100mg tablets
0.30	5.5 ml	1.5 ml	25 mg
0.35	6.0 ml	1.75 ml	25 mg
0.40	7.0 ml	2.0 ml	25 mg
0.45	8.0 ml	2.25 ml	25 mg
0.50	9.0 ml	2.5 (or 2 x 100 mg caps)	50 mg
0.55	10.0 (or 1 x 100 mg caps)	2.75 ml	50 mg
0.60	11.0 ml	3.0 ml	50 mg
0.65	12.0 ml	3.25 ml	50 mg
0.70	13.0 ml	3.5 ml	50 mg
0.75	13.5 ml	3.75 ml	75 mg
0.80	14.5 ml	4.0 ml	75 mg
0.85	15.0 (or half 300 mg tab)	4.25 ml	75 mg
0.90	16.0 ml	4.5 ml	75 mg
0.95	17.0 ml	4.75 ml	75 mg
1.00	18.0 ml	5.0 (or 4 x 100 mg caps)	75 mg
1.05	19.0 ml	5.25 ml	100 mg
1.10	20.0 (or 2 x 100 mg caps)	5.5 ml	100 mg
			CONTINUE 100 mg EVERY 12 HRS UP TO 1.4 BSA

Concomitant tuberculosis in children

Tuberculosis is a common co-morbid illness with HIV. There are two scenarios to consider:

Child presents with TB before commencing ART

- Complete TB therapy if possible before commencing ART OR delay ART for at least 2 months.
- If the child has failed the nevirapine vertical transmission programme, or is less than 3 years old or weighs less than 10 kg, use lopinavir/ritonavir (with ritonavir at the same dosage as lopinavir) as a third drug.
- If the child was not on the nevirapine vertical transmission programme, and is more than 3 years old and weighs more than 10 kg, use efavirenz as the third drug.
- Monitor ALT monthly for the first 6 months of therapy, and then as clinically indicated.

Child develops TB while on ART

- If the child is on lopinavir/ritonavir, then increase ritonavir to same dosage as lopinavir.
- If the child is on nevirapine, and is less than 3 years old or weighs less than 10 kg, switch to lopinavir/ritonavir (with ritonavir at the same dosage as lopinavir).
- If the child is on nevirapine, and is more than 3 years old and weighs more than 10 kg, switch to efavirenz.
- If the child is unable to tolerate the large number of drugs, ART may have to be interrupted until TB therapy has been completed. Discuss all cases with a paediatrician with antiretroviral experience, before interrupting therapy.
- Monitor ALT monthly.

Discuss all cases with a paediatrician with antiretroviral experience, before interrupting therapy.

PCP prophylaxis may be discontinued when the CD4 percentage is consistently >20% for >6 months.

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Table 13: Paediatric dosages per body weight

Weight (kg)	Volume (ml) of EACH dose MORNING / 12 HRS LATER	Volume (ml) of EACH dose MORNING / 12 HRS LATER	Volume (ml) of EACH dose MORNING / 12 HRS LATER		Volume (ml) of EACH dose MORNING / 12 HRS LATER	Amount (mg) of ONE DOSE ONLY (bedtime)
	STAVUDINE (d4T) 1 mg / ml syrup	LAMIVUDINE (3TC) 10 mg / ml syrup	NEVIRAPINE 10 mg / ml		ABACAVIR 20 mg / ml	EFAVIRENZ 50 and 200 mg caps
	TWICE	TWICE	1 – 14 DAYS ONCE	AFTER 14 DAYS TWICE	TWICE	ONCE
4	4 ml	1.5 ml	1.5 ml	3.0 ml	1.6 ml	200 mg
5	5 ml	2.0 ml	2.0 ml	3.5 ml	2 ml	200 mg
6	6 ml	2.5 ml	2.5 ml	4.0 ml	2.4 ml	200 mg
7	7 ml	3.0 ml	3.0 ml	5.0 ml	2.8 ml	200 mg
8	8 ml	3.0 ml	3.0 ml	5.5 ml	3.2 ml	200 mg
9	9 ml	3.5 ml	3.5 ml	6.0 ml	3.6 ml	250 mg
10	10 ml	4.0 ml	4.0 ml	7.0 ml	4 ml	250 mg
11	11 ml	4.5 ml	4.5 ml	8.0 ml	4.4 ml	250 mg
12	12 ml	5.0 ml	5.0 ml	8.5 ml	4.8 ml	250 mg
13	13 ml	5.0 ml	5.0 ml	9.0 ml	5.2 ml	250 mg
14	14 ml	5.5 ml	5.5 ml	10.0 ml	5.6 ml	300 mg
15	15 ml	6.0 ml	6.0 ml	10.5 ml	6 ml	300 mg
16	16 ml	6.5 ml	6.5 ml	11.0 ml	6.4 ml	300 mg
17	17 ml	7.0 ml	7.0 ml	12.0 ml	6.8 ml	300 mg
18	18 ml	7.0 ml	7.0 ml	12.5 ml	7.2 ml	300 mg
19	19 ml	7.5 ml	7.5 ml	13.5 ml	7.6 ml	350 mg
20	20 ml	8.0 ml	8.0 ml	14.0 ml	8 ml	350 mg
21	21 ml	8.5 ml	8.5 ml	15.0 ml	8.4 ml	350 mg
22	22 ml	9.0 ml	9.0 ml	15.5 ml	8.8 ml	350 mg
23	23 ml	9.0 ml	9.0 ml	16.0 ml	9.2 ml	350 mg
24	24 ml	9.5 ml	9.5 ml	17.0 ml	9.6 ml	350 mg
25	25 ml	10.0 ml	10.0 ml	17.5 ml	10 ml	350 mg
26	26 ml	10.5 ml		18.0 ml	10.4 ml	350 mg
27	27 ml	11.0 ml		19.0 ml	10.8 ml	400 mg
28	28 ml	11.0 ml		19.5 ml	11.2 ml	400 mg
29	29 ml	11.5 ml		20.0 ml (1 x 200 mg tab)	11.6 ml	400 mg
30	30 ml	12.0 ml		20.0 ml (1 x 200 mg tab)	12 ml	400 mg
31	30 ml	12 ml		20.0 ml (1 x 200 mg tab)	12.4 ml	400 mg
32	30 ml	13.0 ml		20.0 ml (1 x 200 mg tab)	12.8 ml	400 mg
33	30 ml	13.5 ml		20.0 ml (1 x 200 mg tab)	13.2 ml	600 mg
34	30 ml	13.5 ml		20.0 ml (1 x 200 mg tab)	13.6 ml	600 mg
35	30 ml	14.0 ml		20.0 ml (1 x 200 mg tab)	14 ml	
36	30 ml	14.5 ml		20.0 ml (1 x 200 mg tab)	14.4 ml	
37	30 ml	15.0 ml (1 x 150 mg tab)		20.0 ml (1 x 200 mg tab)	14.8 ml	
>37 up to 39 kg	30 ml	15.0 ml (1 x 150 mg tab)		20.0 ml (1 x 200 mg tab)	300 mg tab	
> 40 up to 59 kg	30 ml	15.0 ml (1 x 150 mg tab)		20.0 ml (1 x 200 mg tab)	300 mg tab	
> 60 kg	40 ml	15.0 ml (1 x 150 mg tab)		20.0 ml (1 x 200 mg tab)	300 mg tab	

Table 15: Dosage and frequency of ART in children

Regimen	Test	Frequency
ddl / AZT / efavirenz	<ul style="list-style-type: none"> ■ CD4 ■ VL ■ FBC 	<ul style="list-style-type: none"> ■ Staging, 6-monthly ■ Baseline, 6-monthly ■ Baseline, then monthly for 3 months, then 6 monthly (with CD4 and viral load) thereafter
ddl / ABC / efavirenz	<ul style="list-style-type: none"> ■ CD4 ■ VL 	<ul style="list-style-type: none"> ■ Staging, 6-monthly ■ Baseline, 6-monthly
AZT / ddl / lopinavir / ritonavir	<ul style="list-style-type: none"> ■ CD4 ■ VL ■ FBC ■ Fasting cholesterol ■ Fasting glucose ■ Fasting triglycerides 	<ul style="list-style-type: none"> ■ Staging, 6-monthly ■ Baseline, 6-monthly ■ Baseline, then monthly for 3 months, then 6 monthly (with CD4 and VL thereafter) ■ Baseline, 6-monthly ■ Baseline, 6-monthly ■ Baseline, 6-monthly

Staging = initial testing for all patients when being referred for ART.

Baseline = testing for ART eligible patients, at initiation of ART.

Drugs	Formulations	Dosage (per dose)	Frequency	Storage	Comments
Nucleoside Reverse Transcriptase Inhibitors (NRTI)					
Zidovudine (ZDV) Retrovir®	Susp: 10 mg/ml Caps: 100 mg, 250 mg	90-180 mg/m ² 180 mg/m ²	3 2	Room temperature	
Didanosine (ddI) Videx®	Susp: 10 mg/ml Tabs: 25 mg, 50 mg, 100 mg, 150 mg	90-120 mg/m ²	2 Can give total daily dosage x 1 in older children	Refrigerate suspension	<ul style="list-style-type: none"> ■ Half hour pre-meals or 1 hour after meals. ■ Use single daily dose if necessary for compliance.
Stavudine (d4T) Zerit®	Susp: 1 mg/ml Caps: 20 mg, 30 mg, 40 mg	1 mg / kg	2	Refrigerate suspension	<ul style="list-style-type: none"> ■ Capsules stable in water suspension for 24 hours in refrigerator.
Abacavir Ziagen®	Susp: 20 mg/ml Tabs: 300 mg	8 mg/kg	2 2	Room temperature	<ul style="list-style-type: none"> ■ BEWARE Hyper-Sensitivity Reaction
Lamivudine (3TC®)	Susp: 10 mg/ml Tabs: 150 mg	4 mg/kg 2 mg/kg for neonates (up to 1 month old)	2	Room temperature	

(continues on following page.)

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Drugs	Formulations	Dosage (per dose)	Frequency	Storage	Comments
Non-Nucleoside Reverse Transcriptase Inhibitors (NNRTI)					
Nevirapine Viramune®	Susp: 10 mg/ml Tabs: 200 mg	120-200 mg/m ² start at 120 mg/m ² daily for 14 days and increase to bd dosage if no rash or severe side-effects	2	Room temperature	Skin rash usually occurs in 1st 6 weeks; do not increase dosage until rash resolves. BEWARE LIVER TOXICITY
Efavirenz Stocrin®	Caps: 50,100 and 200 mg (Suspension available form manufacturer)	13-<15 kg: 200 mg 15-< 20 kg: 250 mg 20-<25 kg: 300 mg 25-<32.5 kg: 350 mg 32.5-<40 kg: 400 mg >40 kg: 600 mg	1	Room temperature	■ No data <3 yrs and <13 kg. Give at night to avoid CNS side-effects.
Protease Inhibitors					
Ritonavir Norvir®	Susp: 80 mg/ml	Start at 250 mg/m ² /dose and increase by 50mg / m ² every 2-3 days up to 400 mg/m ² If <2 years of age 450 mg/m ²	2		■ Take with food. Bitter; coat mouth with peanut butter or chocolate milk. ■ Take 2 hours apart from didanosine.

Drugs	Formulations	Dosage (per dose)	Frequency	Storage	Comments
Nelfinavir Vira-cept®	Susp: 50 mg/1gram Spoon and 200 mg per teaspoon Tabs: 250 mg	Paediatric: 55 mg/kg (adolescent: 750 mg tds) Some experts use 35-45 mg/kg/dose tds <2 years of age	2		■ Give 2 hr pre-or 1 hr post-ddI. Best with light meal. Do not use with rifampicin. ■ Powder is 5% active drug and the rest is carrier powder. Most experts prefer to crush the tablets and suspend in milk or water or sprinkle on pudding.
Protease Inhibitors					
Lopinavir/ ritonavir Kaletra®	Oral solution 80 mg lopinavir (LPV) & 20 mg ritonavir (RTV) per ml caps 133 mg LPV/33 mg RTV	Patients not taking NVP or EFV – 230 mg LPV component/m ² (max 400 mg LPV = adolescent dose) Patients taking NVP or EFV or ART experienced – 300 mg LPV component/m ² max. 533 mg LPV = adolescent dose)	2		■ Oral solution and capsules should be refrigerated. ■ Can be kept at room temperature up to 250C if used within 2 months. ■ Administer with food. High-fat meal increases absorption, especially of the liquid preparation. ■ If co-administered with ddI, ddI should be given 1 hour before or 2 hours after lopinavir/ritonavir.