STEP-BY-STEP GUIDE
FOR THE
MANAGEMENT OF CHILDREN ON ART

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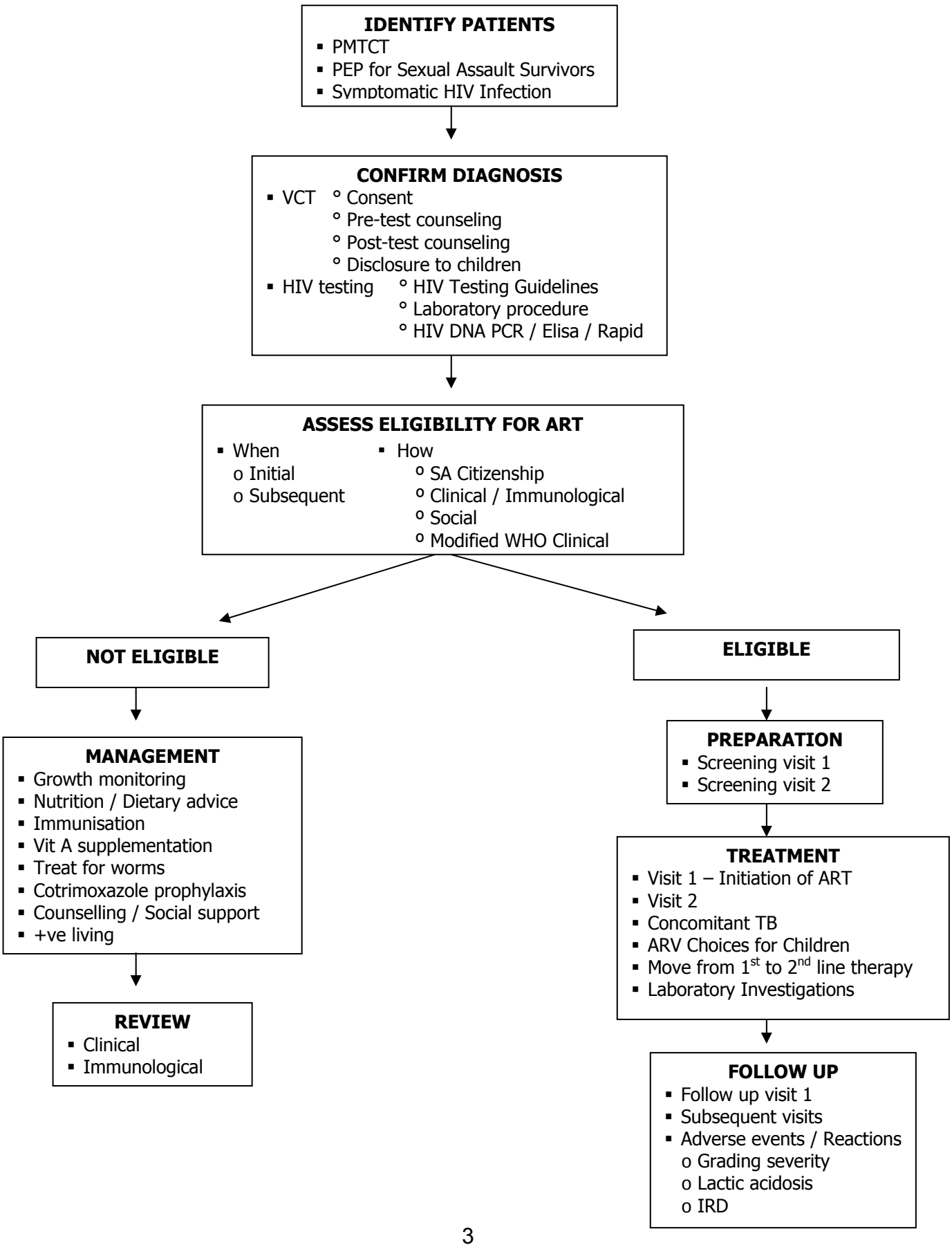
PAEDIATRIC ART PROGRAMME



TREATMENT TIMELINE

Time	Activity
	Identify patients
	Confirm diagnosis
	Assess eligibility for ART programme
- 4 weeks	Screening 1
- 2 weeks	Screening 2
0 weeks	Treatment 1
2 weeks	Treatment 2
4 weeks	Follow up 1
8 weeks	Follow up 2
12 weeks +	Subsequent Visits - 3 monthly (x3) - 6 monthly

IDENTIFY PATIENTS

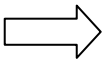
PMTCT PROGRAMME

Symptomatic children:

- HIV disease is suspected on the basis of their clinical status

Asymptomatic children:

- HIV infection confirmed on routine HIV testing as part of the PMTCT programme
    - HIV DNA PCR at 6 weeks, or 6 weeks after cessation of breast feeding
    - Rapid test after 9 months, with confirmatory PCR if child < 18 months



entry points to ART programme if ≥ 6 months of age

SEXUAL ASSAULT POST EXPOSURE PROPHYLAXIS (PEP)

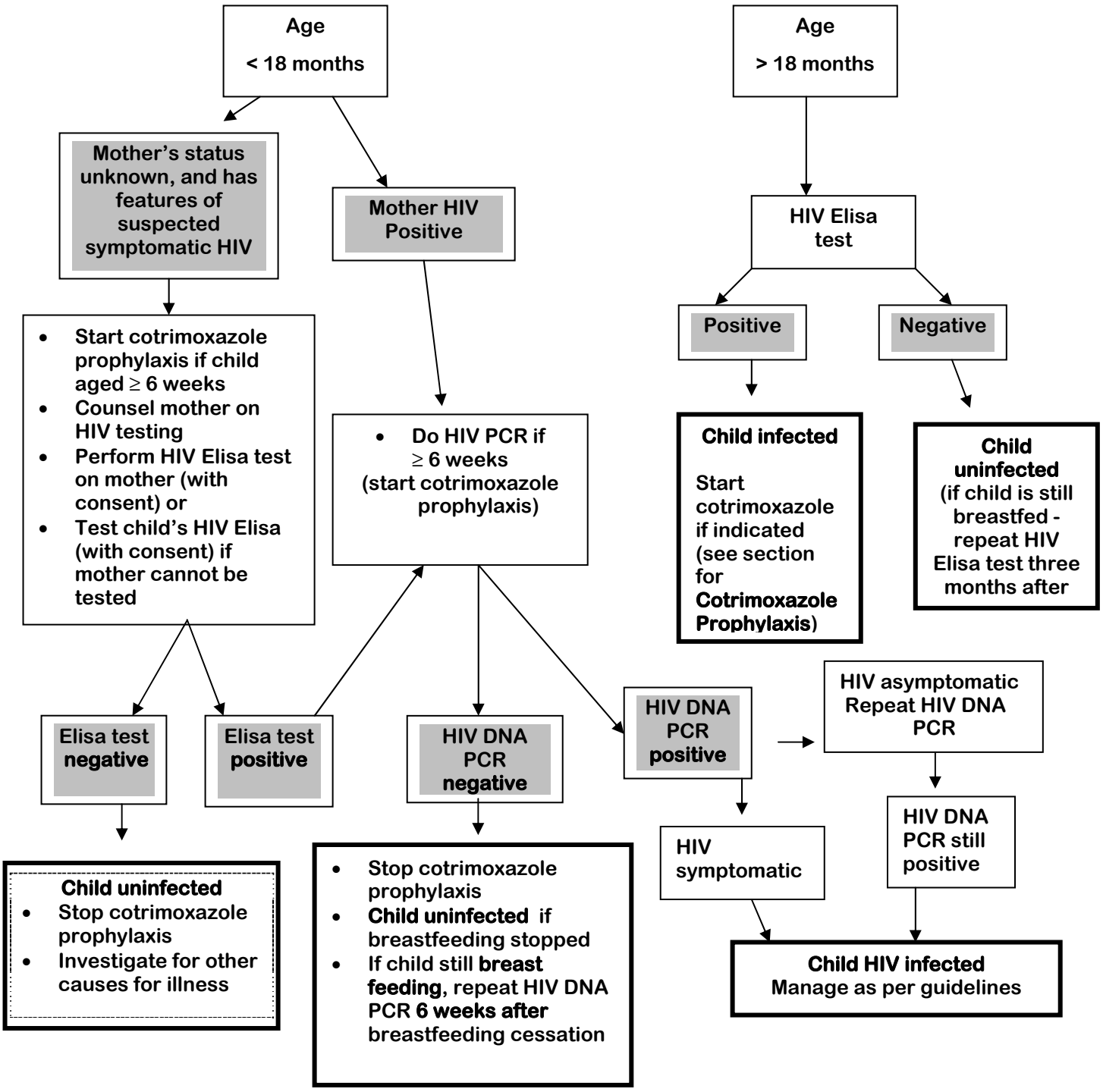
HIV+ status is identified during the PEP programme for survivors of sexual assault.

SYMPTOMATIC HIV INFECTION

- Identification of children with 1 or more signs suggestive of HIV (see IMCI guidelines) during routine clinic, OPD or hospital visits.
- Screening children of HIV-infected adults through adult services:
    - VCT
    - CDC / Family Clinics

CONFIRM DIAGNOSIS

HIV TESTING GUIDELINES



HIV BLOOD SAMPLE REQUIREMENTS

Test	Sample	Transport	Time Frame
Elisa	Red top plain tube	Room temperature	48 hours
CD4	EDTA without gel	Room temperature	72 hours
HIV DNA PCR	EDTA without gel	On ice	48 hours
HIV Viral Load	EDTA with gel	Process within 6 hrs then store at 4° C	Same day

ASSESS ELIGIBILTY FOR ART

Patients must be South African citizens and satisfy clinical / immunological and social criteria before being accepted for treatment.

SOUTH AFRICAN CITIZENSHIP

A South African Birth Registration number or ID number is required for eligibility for the ART programme (i.e. a South African birth certificate).

CLINICAL/IMMUNOLOGICAL CRITERIA

- Confirmation of diagnosis of HIV infection

  AND

- Symptomatic infants < 1 year of age
  - clinically WHO stage II, III and IV, or
  - CD4 < 30%

  OR

- Symptomatic children 1 - 5 years of age
  - clinically WHO Stage III and IV, or
  - CD4 < 20%

  OR

- Symptomatic children > 5 years of age
  - clinically WHO Stage III and IV, or
  - CD4 < 15%, or < 200 cells/mm^3

SOCIAL CRITERIA

These criteria are extremely important for the success of the program and need to be adhered to – the principle is that adherence to treatment must be at least probable.

The following are required:

- Two identifiable caregivers
- Demonstrated reliability in the adult caregivers
- Supportive social environment

WHO CLINICAL STAGING OF HIV/AIDS: INTERIM REVISED

(by SA Working Group)

(For persons under 15 years of age with confirmed laboratory evidence of HIV infection: HIV antibody if aged ≥ 18 months; virological or p24 antigen testing if < 18 months of age)

Stage I

- Asymptomatic
- Persistent generalized lymphadenopathy

Stage II

- Hepatosplenomegaly
- Papular pruritic eruptions
- Seborrhoeic dermatitis
- Extensive human papilloma virus infection
- Extensive molluscum contagiosum
- Fungal nail infections
- Recurrent oral ulcerations
- Lineal gingival erythema (LGE)
- Angular chelitis
- Parotid enlargement
- Herpes zoster
- Recurrent or chronic RTIs (otitis media, otorrhoea, sinusitis)

Stage III

- Moderate unexplained malnutrition not adequately responding to standard therapy
- Unexplained persistent diarrhoea (14 days or more)
- Unexplained persistent fever (intermittent or constant, for longer than 1 month)
- Oral candidiasis (outside neonatal period)
- Oral hairy leukoplakia
- Acute necrotizing ulcerative gingivitis / periodontitis
- Pulmonary TB
- Tuberculous lymphadenopathy (axillary, cervical or inguinal)
- Severe recurrent presumed bacterial pneumonia
- Unexplained anaemia (<8gm/dl), and/or neutropenia (<500/mm^3) and/or thrombocytopenia (<50 000/mm^3) for more than 1 month
- Chronic HIV-associated lung disease including bronchiectasis
- Symptomatic lymphoid interstitial pneumonitis (LIP)

Stage IV

- Unexplained severe wasting or severe malnutrition not adequately responding to standard therapy
- Pneumocystis pneumonia
- Recurrent severe presumed bacterial infection (e.g. empyema, pyomyositis, bone or joint infection, meningitis, but excluding pneumonia)
- Chronic herpes simplex infection (orolabial or cutaneous of more than 1 month's duration)
- Extrapulmonary TB
- Kaposi's sarcoma
- Oesophageal candidiasis
- CNS toxoplasmosis (outside the neonatal period)
- HIV encephalopathy
- CMV infection (CMV retinitis or infection of organs other than liver, spleen or lymph nodes; onset at the age of 1 month or more)
- Extrapulmonary cryptococcosis including meningitis
- Any disseminated endemic mycosis (e.g. extrapulmonary histoplasmosis, coccidiomycosis, penicilliosis)
- Cryptosporidiosis
- Isosporiasis
- Disseminated non-tuberculous mycobacterial infection
- Candida of trachea, bronchi or lungs
- Visceral herpes simplex infection
- Acquired HIV-associated rectal fistula
- Cerebral or B cell non-Hodgkin's lymphoma
- Progressive multifocal leukoencephalopathy (PML)
- HIV-associated cardiomyopathy or HIV-associated nephropathy

SCREENING VISIT 1

1. Complete history and clinical evaluation, including weight and height

NB: Check HIV result, and confirm or do post-test counselling if necessary.

2. Update growth chart

3. Calculate surface area:

$$\text{Body surface area} \quad \text{BSA} = \sqrt{\frac{\text{Ht(cm)} \times \text{Wt(kg)}}{3600}} \ \text{m}^2$$

   or, estimate surface area using the Table in Appendix I

4. Clinical Staging by trained professional nurse or doctor

5. Baseline Developmental Assessment

   Using Appendix II, calculate the Developmental Quotient (DQ) as follows:

$$\text{DQ}\,(\%) = \frac{\text{DA}}{\text{CA}} \times 100$$

   DA = (Fine motor age + Gross motor age + Communication age + Personal/social age) ÷ 4, in months
   CA = Chronological age, in months

6. Determine the nutritional score and respond appropriately (see Appendix III)

7. Take blood for screening CD4 level (EDTA tube without gel; to lab at room temperature within 72 hours)

8. Ensure that TB adequately excluded

9. Name the caregiver/s responsible for medication and make sure that this person is present during all discussion regarding antiretroviral therapy

10. Treatment literacy to provide wellness counselling (group sessions)

NB. If adherence by the family is questionable, they should be brought back for adherence counselling/assessment until such time as the team feels that treatment can be commenced

SCREENING VISIT 2

1. History and clinical evaluation, including weight and height
2. Update growth chart
3. Check that nutritional score is available (see Appendix III)
4. Confirm name of the caregiver/s responsible for medication
5. Treatment literacy in a group session

NB. If adherence by the family is questionable, they should be brought back for adherence counselling/assessment until such time as the team feels that treatment can be commenced

ANTIRETROVIRAL CHOICES FOR CHILDREN

	6 months up to 3 years	**> 3 years and > 10 kg**
1st Line	Stavudine (d4T) Lamivudine (3TC) Kaletra®	Stavudine (d4T) Lamivudine (3TC) Efavirenz (Stocrin®)
2nd Line	Zidovudine (AZT) Didanosine (ddI) Nevirapine / Efavirenz	Zidovudine (AZT) Didanosine (ddI) Kaletra®
For children on TB treatment	Stavudine (d4T) Lamivudine (3TC) Ritonavir	Stavudine (d4T) Lamivudine (3TC) Efavirenz (Stocrin®)

TREATMENT VISIT 1

1. History and clinical evaluation, including weight and height
2. Update growth chart
3. Confirm surface area, using:

   Body surface area $\quad BSA = \sqrt{\frac{Ht(cm) \times Wt(kg)}{3600}}\ m^2$,

   or the Table in Appendix I
4. Baseline Developmental Assessment and DQ, if not done previously (see Appendix II)
5. Check that nutritional score is available and the appropriate response implemented (see Appendix III)
6. Check screening CD4 result (taken at first visit)
7. Identify the correct drug regimen
8. Take blood for baseline investigations (see Laboratory Investigations Table)
9. Review the importance of adherence and devices to assist adherence
10. Explain possible side effects of ART
11. Prescribe medication for 1 month
12. Issue pillboxes, syringes and diary cards, if available
13. Make a treatment plan with the parent or guardian
14. Arrange adherence phone call in 1 week (if possible)
15. Arrange follow up visit after 2 weeks

TREATMENT VISIT 2

1. Adherence assessment (3 day recall)

2. Reconcile returned empty containers with volume of medication prescribed since the last visit

3. Explain exact drug schedule for the child to the guardian, using the diary card

4. Adjust drug schedule if needed (e.g. nevirapine)

5. Issue pillboxes, syringes and diary cards, if available

6. Arrange follow up visit after 2 weeks

LABORATORY INVESTIGATIONS

Time	D4T/3TC/ Kaletra	d4T/3TC/ Efavirenz	AZT/ddI/ NVP	AZT/ddI/ Efavirenz	AZT/ddI/ Kaletra	d4T/3TC/ Ritonavir
-4 weeks (staging)	CD4	CD4	CD4	CD4	CD4	CD4
0 weeks (baseline)	Viral Load FBC ALT TG/Cholesterol (fasting) Glucose (fasting)	Viral Load FBC ALT	Viral Load FBC ALT	Viral Load FBC ALT	Viral Load FBC ALT TG/Cholesterol (fasting) Glucose (fasting)	Viral Load FBC TG/Cholesterol (fasting) Glucose (fasting)
2 weeks			ALT			
1 month			FBC ALT	FBC	FBC	
2 months			FBC ALT	FBC	FBC	
3 months			FBC	FBC	FBC	
6 months **(and 6 monthly)**	CD4 Viral Load FBC ALT TG/Cholesterol (fasting) Glucose (fasting)	CD4 Viral Load FBC ALT	CD4 Viral Load FBC ALT	CD4 Viral Load FBC ALT	CD4 Viral Load FBC ALT TG/Cholesterol (fasting) Glucose (fasting)	CD4 Viral Load FBC TG/Cholesterol (fasting) Glucose (fasting)

FOLLOW UP VISIT 1

1. History and clinical evaluation, including weight and height
2. Update growth chart
3. Adherence assessment (3 day recall)
4. Reconcile returned empty containers with volume of medication prescribed since the last visit
5. Look for signs of toxicity or adverse reactions (see Adverse Events / Reactions Table)
6. Review exact drug schedule for the child with the parent/guardian
7. Adjust drug schedule if needed
8. Do laboratory investigations as required (see Laboratory Investigations Table)
9. Issue medication for 4 weeks
10. Issue pill boxes, syringes and diary cards where needed
11. Arrange follow up visit in 4 weeks

SUBSEQUENT VISITS

1. History and clinical evaluation, including weight and height
2. Update growth chart
3. Monitor development and calculate the DQ every 6 months (see Appendix II)
4. Review surface area every 6 months:

   Body surface area $\quad BSA = \sqrt{\frac{Ht(cm) \times Wt(kg)}{3600}}\ m^2$,

   or, estimate surface area using the Table in Appendix I
5. Adherence assessment (3 day recall)
6. Reconcile returned empty containers with volume of medication prescribed since the last visit
7. Look for signs of toxicity or adverse reactions (see Adverse Events / Reactions Table)
8. Review exact drug schedule for the child with the parent/guardian
9. Adjust drug schedule if needed
10. Do laboratory investigations as required (see Laboratory Investigations Table)
11. Issue medication for 4 weeks
12. Issue pill boxes, syringes and diary cards, if available
13. Arrange follow up visits:
    a. < 12 weeks — monthly
    b. >12 weeks — 3 monthly for clinical assessment (NB monthly to pharmacy for treatment)
    c. Sick children — according to clinical status

MOVE FROM FIRST TO SECOND LINE THERAPY

Consider a move to second-line therapy under the conditions listed in the table below. For practical purposes, it is primarily the clinical features that are of importance.

Clinical	Immunological	Virological
Growth failure Loss of neurodevelopmental milestones New evidence of WHO stage III disease Recurrence of prior opportunistic infections	Confirmed return of CD4 % to baseline More than 50% decline in CD4 %	Rebound of viral load to baseline

ADVERSE EVENTS / REACTIONS

Grading the Severity of Paediatric Adverse Reactions (PACTG)

Laboratory Test Abnormalities				
Item	**Grade 1 Toxicity**	**Grade 2 Toxicity**	**Grade 3 Toxicity**	**Grade 4 Toxicity**
Haemoglobin 3 months to 2 yrs	9.0 - 9.9 g/dL	7.0 - 8.9 g/dL	< 7.0 g/dL	Cardiac failure secondary to anaemia
Haemoglobin 2 years and over	10 - 10.9 g/dL	7.0 - 9.9 g/dL	< 7.0 g/dL	Cardiac failure secondary to anaemia
Absolute Neutrophil Count	0.75 - 1.2 $x10^9$/L	0.4 - 0.749 $x10^9$/L	0.25 - 0.399 x 10^9/L	< 0.25 x 10^9/L
ALT (SGPT)	1.1 - 4.9 x upper normal limit	5.0 - 9.9 x upper normal limit	10.0 - 15.0 x upper normal limit	> 15 x upper normal limit
Triglycerides	-	1.54 - 8.46 mmol/L	8.47 - 13.55 mmol/L	> 13.56 mmol//L
Cholesterol	-	4.43 - 12.92 mmol/L	12.93 - 19.4 mmol/L	> 19.4 mmol/L

Clinical Adverse Events				
Item	**Grade 1 Toxicity**	**Grade 2 Toxicity**	**Grade 3 Toxicity**	**Grade 4 Toxicity**
Peripheral neuropathy	Diagnosis of peripheral neuropathy is difficult in children. Screen motor function against milestones and refer to specialist if peripheral neuropathy is suspected.			
Skin Rash / Dermatitis		Diffuse maculo-papular rash OR Dry desquamation	Vesiculation OR Ulcers	Exfoliative dermatitis OR Stevens-Johnson syndrome OR Erythema multiforme OR Moist desquamation

ACTION ON GRADING

Grades 1 and 2:

- Child remains on therapy
- Repeat the test
- Reassess clinically within 2 weeks

Grade 3:

- Test should be repeated within 1 week
- If still Grade 3, stop ALL antiretroviral drugs and seek expert medical advice

Grade 4:

- Stop all drugs immediately and seek specialist advice
- If the patient restarts therapy after the event has resolved, and the same grade 4 event recurs, appropriate changes or withdrawal of antiretroviral therapy may need to be made
- Decisions should be made on an individual basis, and discussed with experts as required

APPENDIX I

ESTIMATION OF BODY- SURFACE AREA IN INFANTS AND CHILDREN

Source: UKCCSG

Body Weight (kg)	Surface Area (m^2)
2	0.16
2.5	0.19
3	0.21
3.5	0.24
4	0.26
4.5	0.28
5	0.3
5.5	0.32
6	0.34
6.5	0.36
7	0.38
7.5	0.4
8	0.42
8.5	0.44
9	0.46
9.5	0.47
10	0.48

Body Weight (kg)	Surface Area (m^2)
11	0.53
12	0.56
13	0.59
14	0.62
15	0.65
16	0.68
17	0.71
18	0.74
19	0.77
20	0.79
21	0.82
22	0.85
23	0.87
24	0.9
25	0.92
26	0.95
27	0.97
28	1.0
29	1.0
30	1.1

Body Weight (kg)	Surface Area (m^2)
31	1.1
32	1.1
33	1.1
34	1.1
35	1.2
36	1.2
37	1.2
38	1.2
39	1.3
40	1.3
41	1.3
42	1.3
43	1.3
44	1.4
45	1.4
46	1.4
47	1.4
48	1.4
49	1.5
50	1.5

Standardised doses are provided in increments of $0.05m^2$.
Therefore, identify the surface area from the weight on the above table, then **round up** to calculate the actual dose
eg weight 25 kg = SA 0.92 m^2 , then round up to $0.95m^2$.

DEVELOPMENTAL MILESTONES

Age	Gross motor	Fine motor	Communication	Personal/social
3 months	Pull to sit: no head lag Prone: support on forearm lifts head buttocks flat Rolls over	Follows through 180° Hands open Holds object placed in hand Watches hands Pulls at clothes	Coos & chuckles Quietens to familiar sound Turns head towards sound	Excited when fed Reacts to familiar situation
6 months	Pull to sit: braces shoulders pulls to sit Prone: extended arms lifts head & chest Supine: plays with feet Sits with support	Reaches for object Radial approach to toys Transfers Shadow reaction in other arm	Babbles Repetition Laughs aloud Turns to mother's voice	Puts everything in mouth Responds to image in mirror Starts to hold bottle Shows likes & dislikes
9 months	Sits without support Rolls Crawls Rocks on all fours Pulls to stand	Holds a cube in each hand Points	Deliberate vocalisation Babbles Imitates sounds Understands "no" / "bye-bye"	Stranger anxiety Holds bottle Drinks from cup
12 months	Bear creep Walks around furniture sideways Walks with feet apart & arms up	Pincer grasp Releases on request Begins to cast Looks for toy when out of sight	Knows own name 2 - 3 words with meaning Understands simple commands	Finger feeds Pushes arms into sleeves Plays games
15 months	Walks alone Collapses backwards Stairs: creeps up, goes down backwards	2 cube tower Holds 2 cubes in one hand	Jabbers with expression 2 - 6 words Points to objects on request	Picks up, drinks & puts down cup Spoon feeds with a mess Indicates wet nappy

Age	Gross motor	Fine motor	Communication	Personal/social
18 months	Walks with arms down Cannot turn unless still Pulls a toy Throws a ball Climbs onto chair	3 cube tower Scribbles	6 - 20 words	Handles spoon well Looks at pictures Takes off shoes & socks
24 months	Runs Stairs: up & down 2 feet per step Kicks a ball Squats & rises without hands	6 cube tower Obvious hand preference	~ 50 words Short phrases Asks for food, drink, toilet	Spoon feeds without mess Clean & dry by day Pretend play
36 months	Rides tricycle Stairs: up - 1 foot per step down - 2 feet per step Climbs Walks on tiptoes Throws & kicks ball	9 cube tower Copies circle Cuts with scissors Builds a bridge	Knows name & sex Uses pronouns Talks incessantly	Toilet trained Dresses with supervision Eats with a fork Washes & dries hands
48 months	Stairs: up & down 1 foot per step Stands on 1 leg for 3 – 5 seconds Hops	Copies cross Builds gate	Full name & age Recognizes colours	Eats with spoon & fork Dresses & undresses Make believe play
60 months	Walks along narrow line Hops on each foot separately	6 cube steps Copies square & triangle Draws a man	Fluent speech Knows 3 opposites	Dresses & undresses alone Uses knife & fork Chooses own friends
72 months	Sits up without using hands Walks backwards along straight line	10 cube steps Copies diamond	Learns comparatives	Cooperative play

APPENDIX III

NUTRITION RISK SCREENING TOOL

Nutrition Risk Score	Assessment	Intervention
1. Growth: present weight (using RTHC) • Growing well 0 • Flattened growth curve/Weight loss 2 • ≤ 3rd percentile 4 • ≤ 60th of expected weight 6	**Total Score: 0 – 3** **'Not currently at risk'**	- Nutrition education
2. Appetite • Good (most of plate eaten) 0 • Poor (½ plate eaten) 2 • Unable to eat (no food for 2 days) 3	**Total Score: 4 – 5** **'At risk'**	- Refer to dietician - Increase energy intake: fortify normal food with e.g. full cream milk (FCM) powder - Monitor regularly
3. Ability to eat (intake) • No problems 0 • Mild vomiting/diarrhoea 1 • Difficulty with swallowing, chewing 2 • Severe vomiting/diarrhea 3		
4. Other Problems: • None 0 • HIV/AIDS 2 • HIV/AIDS & other infections e.g. TB 3	**Total Score: ≥ 6** **'Malnourished'**	- Refer to dietician - Supplement with: i. Multivitamins, and ii. Additional energy ▪ 6 months – 1 year: FCM Enriched maize meal ▪ 1 – 6 years: Pediasure Enriched maize meal ▪ 7 years: Pediasure Enriched maize meal
Total score = **add up the appropriate score from each of the four categories**		

APPENDIX IV

INTRODUCTION TO ARV DRUG PROFILES

- ✓ Our aim is to move from syrup to capsules/tablets as soon as possible. Learning to swallow may require careful coaching by a neutral trainer.

- ✓ However, it is important that a child stay on syrups until s/he is comfortable swallowing capsules and tablets, which usually occurs around 6 years of age.

- ✓ Pre-school children will usually require syrups hence the following tables DO NOT include dosages in capsules/tablets for smaller children.

- ✓ When dispensing tablets that need to be halved, please provide a tablet cutter if possible.

- ✓ HIV-infected children tend to have poor growth and are therefore small for age. Please use the Body-Surface Area tables in Appendix II to determine correct dosages, rather than tables that use age or height.

- ✓ An adolescent should be changed to the adult regimen when s/he reaches Tanner stage 3 or more.

Nucleoside Reverse Transcriptase Inhibitors (NRTIs)

- d4T (Stavudine; e.g. Zerit®)
- 3TC (Lamivudine; e.g. 3TC®)
- ddI (Didanosine; e.g. Videx®)
- AZT (Zidovudine e.g. Retrovir®)
- Abacavir (e.g. Ziagen®)

Non-Nucleoside Reverse Transcriptase Inhibitors (NNRTIs)

- Nevirapine (e.g. Viramune®)
- Efavirenz (e.g. Stocrin®)

Protease Inhibitors

- Lopinavir/Ritonavir (e.g. Kaletra®)
- Ritonavir (e.g. Norvir®)
- Nelfinavir (e.g. Viracept®) – not yet available in KZN

d4T (Stavudine; Zerit®)

Dose:
1 mg/kg/dose

Frequency:
12 hourly

Formulation:
Suspension - 1 mg/ml
(requires refrigeration)
Capsules - 20 mg, 30 mg & 40 mg

Comments:
- Can administer with food.
- Do not combine with AZT.
- Combination with ddI has ↑ rate of toxicity.
- To reconstitute, dissolve 20 mg capsule in 20 ml water giving a concentration of 1 mg/ml (if only using ½ capsule – discard remaining half).

Side effects:
Common
Headache
GIT disturbance
Skin rash

Rarer
Pancreatitis
Peripheral neuropathy
↑ Liver enzymes
Lactic acidosis

Wt (in kg)	Dosage by weight		
	mg	ml	Capsules
4	4 mg	4 ml	-
5	5 mg	5 ml	-
6	6 mg	6 ml	-
7	7 mg	7 ml	-
8	8 mg	8 ml	-
9	9 mg	9 ml	-
10	10 mg	10 ml	½ 20 mg capsule
11	11 mg	11 ml	½ 20 mg capsule
12	12 mg	12 ml	½ 20 mg capsule
13	13 mg	13 ml	½ 30 mg capsule
14	14 mg	14 ml	½ 30 mg capsule
15	15 mg	15 ml	½ 30 mg capsule
16	16 mg	16 ml	½ 30 mg capsule
17	17 mg	17 ml	20 mg capsule
18	18 mg	18 ml	20 mg capsule
19	19 mg	19 ml	20 mg capsule
20	20 mg	20 ml	20 mg capsule
21	21 mg	21 ml	20 mg capsule
22	22 mg	22 ml	20 mg capsule
23	23 mg	23 ml	20 mg capsule
24	24 mg	24 ml	20 mg capsule
25	25 mg	25 ml	30 mg capsule
26	26 mg	26 ml	30 mg capsule
27	27 mg	27 ml	30 mg capsule
28	28 mg	28 ml	30 mg capsule
29	29 mg	29 ml	30 mg capsule
30	30 mg	30 ml	30 mg capsule
31	30 mg	30 ml	30 mg capsule
32	30 mg	30 ml	30 mg capsule
33	30 mg	30 ml	30 mg capsule
34	30 mg	30 ml	30 mg capsule
35	30 mg	30 ml	30 mg capsule
36	30 mg	30 ml	30 mg capsule
37	30 mg	30 ml	30 mg capsule

3TC (Lamivudine; 3TC®)

Dose:
4 mg/kg/dose

Frequency:
12 hourly

Formulation:
Syrup - 10 mg/ml
Tablets - 150 mg

Comments:
Can be administered with food

Side effects:
Common
- Headache
- Fatigue
- Nausea & diarrhoea
- Skin rash
- Abdominal pain

Rarer
- Pancreatitis
- Peripheral neuropathy
- ↓ WCC
- ↑ Liver enzymes
- Lactic acidosis

Wt (in kg)	Dosage by weight		
	mg	ml	Tablets (150mg)
4	16 mg	1.5 ml	-
5	20 mg	2.0 ml	-
6	24 mg	2.5 ml	-
7	28 mg	3.0 ml	-
8	32 mg	3.0 ml	-
9	36 mg	3.5 ml	-
10	40 mg	4.0 ml	-
11	44 mg	4.5 ml	-
12	48 mg	5.0 ml	-
13	52 mg	5.0 ml	-
14	56 mg	5.5 ml	-
15	60 mg	6.0 ml	-
16	64 mg	6.5 ml	-
17	68 mg	7.0 ml	½ tablet
18	72 mg	7.0 ml	½ tablet
19	76 mg	7.5 ml	½ tablet
20	80 mg	8.0 ml	½ tablet
21	84 mg	8.5 ml	½ tablet
22	88 mg	9.0 ml	½ tablet
23	92 mg	9.0 ml	½ tablet
24	96 mg	9.5 ml	¾ tablet*
25	100 mg	10.0 ml	¾ tablet*
26	104 mg	10.5 ml	¾ tablet*
27	108 mg	11.0 ml	¾ tablet*
28	112 mg	11.0 ml	¾ tablet*
29	116 mg	11.5 ml	¾ tablet*
30	120 mg	12.0 ml	¾ tablet*
31	124 mg	12.5 ml	¾ tablet*
32	128 mg	13.0 ml	1 tablet
33	132 mg	13.5 ml	1 tablet
34	136 mg	14.0 ml	1 tablet
35	140 mg	14.5 ml	1 tablet
36	144 mg	15.0 ml	1 tablet
37	148 mg	15.0 ml	1 tablet

* best achieved by giving: ½ tablet in the morning and 1 tablet at night

ddI (Didanosine; Videx®)

Dose:
90 - 150 mg/m^2/dose

Frequency:
12 hourly

Formulation:
Suspension - 10 mg/ml
(stable for 30 days; requires refrigeration)
Tablets - 25 mg, 50 mg, 100 mg & 150 mg (buffered)

Comments:
Do not administer with food - give 1 hour before or 2 hours after meals.
Suspension must be reconstituted with antacid.

Side effects:
Common

Abdominal pain
Diarrhoea
Nausea & vomiting

Rarer

Pancreatitis
Peripheral neuropathy
Lactic acidosis

NB: Each dose must include at least TWO tablets to ensure adequate intake of buffer per dose

Surface area (m^2)	Dosage by surface area (m^2)		
	mg	ml	Tablets
0.30	25 mg	2.5 ml	-
0.35	50 mg	5.0 ml	-
0.40	50 mg	5.0 ml	-
0.45	50 mg	5.0 ml	-
0.50	50 mg	5.0 ml	2 x 25 mg
0.55	75 mg	7.5 ml	1 x 25 mg + 50 mg
0.60	75 mg	7.5 ml	1 x 25 mg + 50 mg
0.65	75 mg	7.5 ml	1 x 25 mg + 50 mg
0.70	100 mg	10.0 ml	2 x 50 mg
0.75	100 mg	10.0 ml	2 x 50 mg
0.80	100 mg	10.0 ml	2 x 50 mg
0.85	100 mg	10.0 ml	2 x 50 mg
0.90	100 mg	10.0 ml	2 x 50 mg
0.95	100 mg	10.0 ml	2 x 50 mg
1.00	125 mg	15.0 ml	1 x 25 mg + 100 mg
1.05	150 mg	15.0 ml	1 x 50 mg + 100 mg
1.10	150 mg	15.0 ml	1 x 50 mg + 100 mg

AZT (Zidovudine; Retrovir®)

Dose:
180 - 270 mg/m^2/dose

Frequency:
12 hourly

Formulation:
Syrup - 10 mg/ml
Capsules - 100 mg
Tablets - 300 mg

Comments:
Better tolerated with food.
Do not give with d4T.

Side effects:
Common
Headache
Anaemia
↓ granulocytes

Rarer
Myopathy
Lactic acidosis

Surface area (m^2)	Dosage by surface area (m^2)		
	mg	ml	Capsules
0.30	75 mg	5.5 ml	-
0.35	75 mg	6.0 ml	-
0.40	100 mg	7.0 ml	-
0.45	100 mg	8.0 ml	-
0.50	100 mg	9.0 ml	1 capsule
0.55	100 mg	10.0 ml	1 capsule
0.60	150 mg	11.0 ml	1½ capsules*
0.65	150 mg	12.0 ml	1½ capsules*
0.70	150 mg	13.0 ml	1½ capsules*
0.75	200 mg	13.5 ml	2 capsules
0.80	200 mg	14.5 ml	2 capsules
0.85	200 mg	15.0 ml	2 capsules
0.90	200 mg	16.0 ml	2 capsules
0.95	200 mg	17.0 ml	2 capsules
1.00	200 mg	18.0 ml	2 capsules
1.05	300 mg	19.0 ml	3 capsules
1.10	300 mg	20.0 ml	3 capsules

* best achieved by giving: 1 capsule in the morning and 2 capsules at night

Abacavir (Ziagen®)

Dose:
8 mg/kg/dose

Frequency:
12 hourly

Formulation:
Syrup - 20 mg/ml
Tablets - 300 mg

Comments:
- Can administer with food.
- **Hypersensitivity reaction** (with or without rash) can be fatal.
- Re-challenge contra-indicated in any patient who has had hypersensitivity reaction.
- Do not stop Abacavir unless advised by doctor.

Side effects:
Common

Headache
Nausea and vomiting
Diarrhoea

Rarer

Hypersensitivity reaction
(usually in first 6 weeks; comprises fever, skin rash and GIT disturbance)
Anaemia
Neutropaenia
Pancreatitis

Wt (in kg)	Dosage by weight		
	mg	ml	Tablets
4	32 mg	1.5 ml	-
5	40 mg	2.0 ml	-
6	48 mg	2.5 ml	-
7	56 mg	3.0 ml	-
8	64 mg	3.0 ml	-
9	72 mg	3.5 ml	-
10	80 mg	4.0 ml	-
11	88 mg	4.5 ml	-
12	96 mg	5.0 ml	-
13	104 mg	5.0 ml	-
14	112 mg	5.5 ml	-
15	120 mg	6.0 ml	-
16	128 mg	6.5 ml	-
17	136 mg	7.0 ml	½ tablet
18	144 mg	7.0 ml	½ tablet
19	152 mg	7.5 ml	½ tablet
20	160 mg	8.0 ml	½ tablet
21	168 mg	8.5 ml	½ tablet
22	176 mg	9.0 ml	½ tablet
23	184 mg	9.0 ml	½ tablet
24	192 mg	9.5 ml	½ tablet
25	200 mg	10.0 ml	½ tablet
26	208 mg	10.5 ml	½ tablet
27	216 mg	11.0 ml	½ tablet
28	224 mg	11.0 ml	1 tablet
29	232 mg	11.5 ml	1 tablet
30	240 mg	12.0 ml	1 tablet
31	248 mg	12.5 ml	1 tablet
32	256 mg	13.0 ml	1 tablet
33	264 mg	13.0 ml	1 tablet
34	272 mg	13.5 ml	1 tablet
35	280 mg	14.0 ml	1 tablet
36	288 mg	14.5 ml	1 tablet
37	296 mg	30 ml	1 tablet

Nevirapine (Viramune®)

Dose:
120 - 200 mg/m^2/dose

Frequency:
Daily for 14 days
THEN
12 hourly

Formulation:
Syrup - 10 mg/ml
Tablets - 200 mg

Comments:
Can administer with food
Skin rash can occur within 1st 6 weeks – do not increase dose until rash resolves.
Stop treatment if LFTs ↑.

Surface area (m^2)	Dosage by surface area (m^2)		
	mg	ml	Tablets
0.30	50 mg	5.0 ml	-
0.35	50 mg	5.0 ml	-
0.40	75 mg	7.5 ml	-
0.45	75 mg	7.5 ml	-
0.50	100 mg	10.0 ml	½ tablet
0.55	100 mg	10.0 ml	½ tablet
0.60	100 mg	10.0 ml	½ tablet
0.65	100 mg	10.0 ml	½ tablet
0.70	100 mg	10.0 ml	½ tablet
0.75	100 mg	10.0 ml	½ tablet
0.80	100 mg	10.0 ml	½ tablet
0.85	150 mg	15.0 ml	¾ tablet*
0.90	150 mg	15.0 ml	¾ tablet*
0.95	150 mg	15.0 ml	¾ tablet*
1.00	200 mg	20.0 ml	1 tablet
1.05	300 mg	20.0 ml	1 tablet
1.10	300 mg	20.0 ml	1 tablet

* best achieved by giving: ½ tablet in the morning and 1 tablet at night

Side effects:

Common

Skin rash (including Stevens Johnson & Toxic Epidermal Necrolysis)
Sedation
Diarrhoea

Rarer

Liver toxicity (↑ liver enzymes, RUQ pain etc)
Hypersensitivity reaction (rash, fever, oral sores, conjunctivitis & facial oedema)

Efavirenz (Stocrin®)

Dose:
See table

Frequency:
Daily

Formulation:
Capsules - 50 mg & 200 mg
Tablets - 600 mg

Comments:
Not suitable for children < 10kg or < 3 years of age.
Give at night to avoid CNS side-effects.
Preferably take on empty stomach.

Side effects:
Common
Skin rash
CNS – drowsiness, insomnia, abnormal dreams, confusion, poor concentration, hallucinations, amnesia

Rarer
↑ Liver enzymes

Wt (in kg)	Dosage by weight	
	mg	Capsules
10	200 mg	200 mg capsule
11	200 mg	200 mg capsule
12	200 mg	200 mg capsule
13	200 mg	200 mg capsule
14	200 mg	200 mg capsule
15	250 mg	50 mg + 200 mg capsule
16	250 mg	50 mg + 200 mg capsule
17	250 mg	50 mg + 200 mg capsule
18	250 mg	50 mg + 200 mg capsule
19	250 mg	50 mg + 200 mg capsule
20	300 mg	2 x 50 mg + 200 mg capsule
21	300 mg	2 x 50 mg + 200 mg capsule
22	300 mg	2 x 50 mg + 200 mg capsule
23	300 mg	2 x 50 mg + 200 mg capsule
24	300 mg	2 x 50 mg + 200 mg capsule
25	350 mg	3 x 50 mg + 200 mg capsule
26	350 mg	3 x 50 mg + 200 mg capsule
27	350 mg	3 x 50 mg + 200 mg capsule
28	350 mg	3 x 50 mg + 200 mg capsule
29	350 mg	3 x 50 mg + 200 mg capsule
30	350 mg	3 x 50 mg + 200 mg capsule
31	350 mg	3 x 50 mg + 200 mg capsule
32	350 mg	3 x 50 mg + 200 mg capsule
33	400 mg	2 x 200 mg capsule
34	400 mg	2 x 200 mg capsule
35	400 mg	2 x 200 mg capsule
36	400 mg	2 x 200 mg capsule
37	400 mg	2 x 200 mg capsule
38	400 mg	2 x 200 mg capsule
39	400 mg	2 x 200 mg capsule
> 40	600 mg	600 mg tablet

Lopinavir/Ritonavir (Kaletra®)

Dose:
230 - 400 mg LPV/m^2/dose

Frequency:
12 hourly

Formulation:
Syrup - 80mg LPV & 20mg RTV/ml
(requires refrigeration)
Capsules - 133mg LPV / 33mg RTV
(requires refrigeration)

Comments:
Administer with food (high fat meal increases absorption).
In regimen with ddI give Kaletra 1 hour after
or 2 hours before ddI.

Surface area (m^2)	Dosage by surface area (m^2)	
	ml	Capsules
0.30	1.0 ml	-
0.35	1.0 ml	-
0.40	1.5 ml	-
0.45	1.5 ml	-
0.50	2.0 ml	-
0.55	2.0 ml	-
0.60	2.0 ml	-
0.65	2.0 ml	-
0.70	2.0 ml	-
0.75	2.5 ml	1 capsule
0.80	2.5 ml	1 capsule
0.85	3.0 ml	2 capsules
0.90	3.0 ml	2 capsules
0.95	3.5 ml	2 capsules
1.00	3.5 ml	2 capsules
1.05	4.0 ml	2 capsules
1.10	5.0 ml	3 capsules

Side effects:
Common
Diarrhoea
Nausea & vomiting

Rarer
↑ Cholesterol
↑ Triglycerides
Diabetes & hyperglycaemia

Ritonavir (Norvir®)

Dose:
350 – 400 mg/m^2/dose

Start at ⅔ dose for 2 days,
then ¾ dose for 2 days,
then full dose, to minimize nausea

Frequency:
12 hourly

Formulation:
Syrup - 80mg/ml
(at room temperature for 30 days only - otherwise refrigerate)
Capsules - 100mg

Comments:
Administration with food increases absorption.
If in regimen with ddI should be 2 hours between taking each drug.
Poorly tolerated due to extremely unpleasant taste.
To increase tolerance
- mix with milk/yoghurt
- dull taste buds with ice
- give peanut butter before
- give strong-tasting foods immediately after dose

Surface area (m^2)	Dosage by surface area (m^2)	
	ml	Capsules
0.30	1.5 ml	-
0.35	1.5 ml	-
0.40	2.0 ml	-
0.45	2.0 ml	-
0.50	2.5 ml	2 capsules
0.55	2.5 ml	2 capsules
0.60	3.0 ml	am: 2 capsules & pm: 3 capsules
0.65	3.0 ml	am: 2 capsules & pm: 3 capsules
0.70	3.5 ml	3 capsules
0.75	3.5 ml	3 capsules
0.80	4.0 ml	3 capsules
0.85	4.0 ml	am: 3 capsules & pm: 4 capsules
0.90	4.5 ml	am: 3 capsules & pm: 4 capsules
0.95	4.5 ml	4 capsules
1.00	5.0 ml	4 capsules
1.05	5.0 ml	4 capsules
1.10	5.5 ml	am: 4 capsules & pm: 5 capsules
1.15	5.5 ml	am: 4 capsules & pm: 5 capsules
1.20	6.0 ml	5 capsules
1.25	6.0 ml	5 capsules
1.30	6.0 ml	5 capsules
1.35	6.5 ml	am: 5 capsules & pm: 6 capsules
1.40	6.5 ml	am: 5 capsules & pm: 6 capsules
1.45	7.0 ml	am: 5 capsules & pm: 6 capsules
1.50	7.5 ml	6 capsules

Side effects:
Common
- Nausea & vomiting
- Diarrhoea
- Headache
- Abdominal pain
- Anorexia

Rarer
- Circumoral paraethesia
- ↑ Liver enzymes
- Pancreatitis
- ↑ Triglycerides and ↑ Cholesterol
- Diabetes & hyperglycaemia

Nelfinavir (Viracept®)

Dose:
> 2 years: 60 mg/kg/dose

Frequency:
12 hourly

Formulation:
Tablets - 250 mg

Tablets may be crushed and dispersed in water/milk or mixed with a small amount of food and ingested immediately.
The entire contents must be consumed to obtain the complete dose.

Wt (in kg)	Dosage by weight
	Tablets
7 - < 8.5	2
8.5 - < 10.5	2
10.5 - < 12	3
12 - < 14	3
14 - < 16	4
16 - < 18	4
18 - < 23	5
> 23	5

Comments:
Take with or after food, to improve absorption.
Diarrhoea controllable with loperamide or calcium carbonate.
NB: Calcium carbonate must NOT be taken at the same time as nelfinavir.
DO NOT use with rifampicin.

Side effects:
- Diarrhoea
- Nausea
- Hyperlipidaemia
- Fat redistribution

SIMPLIFIED PAEDIATRIC DRUG DOSING FOR RESOURCE POOR SETTINGS
First Line (Regimen 1)

Weight (kg)	**D4T** 1 mg/kg/dose twice daily Suspension 1 mg/ml, or Capsules	**3TC** 4 mg/kg/dose twice daily Syrup 10 mg/ml, or Tablets		**EFAVIRENZ (Stocrin®)** Once daily Capsules (50 mg & 100 mg)	**KALETRA (LPV/RNV)** Twice daily Liquid	**RITONOVIR** Twice daily Liquid Capsules (100 mg)		**Intensive TB Treatment** (first 2 months) Mon - Fri, daily RHZ 60/30/150 Rimcure Paed 3FDC tablets	**Maintainence TB Treatment** (last 4 months) Mon - Fri, daily RH 60/30 Rifanah Sachets	**Bactrim** (PCP Prophylaxis) Daily Syrup, or Tablets	**Multivitamins** (Remember to give Vitamin A) Daily Syrup, or Tablets
5 – 6,9	6 ml	2 ml			1,5 ml	1,5 ml		1	1	5 ml	2,5 ml
7 – 9,9	10 ml	3 ml			2 ml	2 ml		1½	1½	5 ml	2,5 ml
10 – 11,9	10 ml	4 ml		200 mg	2 ml	2,5 ml	2	2	2	7,5 ml	5 ml
12 – 14,9	15 ml	5 ml		200 mg	2 ml	3 ml	am: 2 pm: 3	2	2	7,5 ml	5 ml
15 – 16,9	15 ml	6 ml		200 mg + 50 mg	2 ml	3,5 ml	3	3	3	10 ml	5 ml
17 – 19,9	20 mg	7 ml	½ tab	200 mg + 50 mg	2,5 ml	3,5 ml	3	3	3	10 ml /1½ tab	5 ml
20 – 24,9	20 mg	9 ml	am: ½ pm: 1	200 mg + 2 x 50 mg	3 ml	4 ml	am: 3 pm: 4	4	4	15 ml /2 tab	1 tab
25 – 29,9	30 mg	11 ml	1 tab	200 mg + 3 x 50 mg	3,5 ml	5 ml	4	5	5	2 tab	1 tab
30 – 34,9	30 mg	13 ml	1 tab	200 mg + 3 x 50 mg	4 ml	5,5 ml	am: 4 pm: 5	6	6	2 tab	1 tab
35 – 40	30 mg	15 ml	1 tab	200 mg + 200 mg	5 ml	6 ml	5	Use adult dose 2 Rifafour	Use adult dose 2 Rimactizid 150/75	2 tabs	1 tab

Compiled for KwaZulu-Natal ARV Clinics – Dr Kimesh Naidoo (Grey's Hospital - PMB)
Adapted from Paediatric Antiretroviral and Cotrimoxazole Dosing – *Mailman School of Public Health - Columbia University & National Paediatric Guidelines, Department of Health, USA*