National Integrated Guidelines for

Prevention, Care and Treatment of HIV and AIDS

in Liberia

2020 Simplified Edition

National AIDS and STI Control Program

Ministry of Health

Republic of Liberia

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Tables and Figures

Acknowledgements

The National AIDS and STI Control Program (NACP) of the Ministry of Health, Republic of Liberia gratefully acknowledges the contributions of the Technical Working Groups, under the able leadership of Dr. Garbo Toomey, Program Manager, NACP, Ministry of Health, Liberia. I sincerely appreciate the huge and untiring commitment of the local USG HIV and GF implementing partners who have continued to stand shoulder to shoulder with us in the national response. We are grateful to the World Health Organization (WHO) for providing the updates to the 2016 Consolidated Guidelines on the use of anti-retroviral drugs for treating and preventing HIV infection, which served as an important resource for the development of this revised guidelines, as well as the United States Agency for International Development (USAID) for supporting the convening of the technical review and validation meetings, and the printing of the guidelines for distribution among health workers.

Also, a significant portion of the guidelines have been adapted from the WHO 2019 revised recommendations on Dolutegravir, and the simplified layout of the treatment guideline of the Republic of Swaziland, South Africa and Malawi, countries with a high HIV burden and having good strides towards achieving epidemic control.

Our special thanks also go to colleagues from the National AIDS Commission, the academia, frontline health workers, the civil society and the association of people living with HIV (PLHIV) in Liberia for their invaluable contributions to the process. I am proud and grateful to my team at the NACP for the professionalism and huge commitment in coordinating the development of the guidelines. We all look forward with greater optimism to a season of better care and treatment for our friends and family members living with HIV.

Thank you.

Dr. Wilhelmina Jallah
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Foreword

Liberia is making steady progress towards the attainment of the UNAIDS 90-90-90 targets with 66% of current estimated number of PLHIV in the country knowing their HIV status, 53% of those living with HIV being placed on antiretroviral therapy and 52% of those on treatment achieving viral suppression. We are determined as a people and a government to accomplish epidemic control in the few years ahead, and a Liberia where HIV is no longer a disease of public health concern by 2030. The 2014 Guideline for the clinical and programmatic management of HIV/AIDS in Liberia has been a useful instrument for the attainment of this feat. In the county and peripheral health facilities, the guideline facilitated service delivery in line with best practice.

The fluctuating landscape of drug sensitivity to the HIV disease and the growing list of better and cheaper regimen option necessitated the revision of the 2014 Guideline. Within the concept of chronic illness management, the need to reflect the differentiation of illness classes between stable and unstable states cannot be overemphasized. The development of these Guidelines underscores Government's commitment to ensuring that all PLHIV in Liberia have access to high quality HIV prevention and treatment services.

The 2020 Guidelines for the clinical management of HIV in Liberia is the product of the thorough review of the 2014 document guided by the public health philosophy of WHO enshrined in the 2016 consolidated Guidelines on the use of anti-retroviral drugs for treating and preventing HIV infection. The process was inclusive, and painstaking and Government is sincerely appreciative of the huge commitment of development partners, notably, USG supported agencies, WHO, UNAIDS, UNICEF, PLHIV groups, CSOs, medical and pharmaceutical regulatory agencies, State Ministries of Health and facility level service providers. We introduced a reasonable balance between expectations of science and the realities of our own environment, carefully matching needs with availability of capacity and resources. Notwithstanding, we took extra care to ensure the essentials of the recommendations of the global HIV community are not left out.

The 2020 Guidelines has not deviated significantly in content from the 2014 guidelines. The key changes include simplification of the layout to align with the simplified Malawi HIV treatment program guidelines which has achieved the UNAIDS 90-90-90 target ahead of time; introduction of ARV regimen changes and regrouping of care packages and laboratory related activities for the monitoring of HIV treatment. The new recommendations require that all patients currently on Tenofovir, Lamivudine and efavirenz-600 be migrated to the superior cocktail of Tenofovir, Lamivudine and Dolutegravir. A chapter is allocated to lab-related activities for HIV monitoring and the care continuum for PLHIV on treatment is categorized to meet the WHO definition for stable and unstable patients. Although, specialized facilities and more resourced centers of excellence in Liberia, with additional support, are able to do more for patient treatment and support, this document serves the purpose of ensuring that the prevention and treatment of HIV infection is of uniformly good standard across the country and that in exercising their mandates stakeholders are not in breach of Government's aspirations for the wellbeing of its people living with HIV including the key affected populations. I, therefore recommend these guidelines for all persons and organizations involved in the delivery of HIV prevention and treatment services in Liberia.

Dr. Julia Garbo Toomey
Program Manager
NACP, Ministry of Health

Acronyms and Abbreviations

3TC	Lamivudine
ABC	Abacavir
ANC	Antenatal care
ARM	Artificial rupture of membranes
ART	Antiretroviral therapy
ARVs	Antiretroviral drugs
ATV/r	Atazanavir / ritonavir
AZT	Zidovudine
B6	Pyridoxine
BCG	Bacille Calmette-Guérin
Benzyl pen	Benzyl penicillin
BF	Breastfeeding
BMI	Body mass index
CMS	Central Medical Stores
CO	Clinical Officer
CPT	Cotrimoxazole preventive therapy
CrAg	Cryptococcal antigen
CSF	Cerebrospinal fluid
CTX	Cotrimoxazole
CXR	Chest X-ray
d4T	Stavudine
DBS	Dried blood spot
dl	decilitre
DL	Detection limit (for viral load)
DNA-PCR	Deoxyribonucleic acid polymerase chain reaction
DAR	Daily activity register
DDR	Daily dispensing register
DOB	Date of birth
DSD	Differentiated Service Delivery
DRV/r	Darunavir boosted with ritonavir
DTG	Dolutegravir
E	Ethambutol
EFV	Efavirenz
EHP	Essential health package
EID	Early Infant Diagnosis
ETV	Etravirine
e-LMIS	Electronic logistics management information system
EMB	Ethambutol
EPI	Extended Program on Immunization
EPTB	Extra-pulmonary tuberculosis

FDC	Fixed dose combination
FP	Family planning
FRS	Family referral slip
GIT	Gastrointestinal tract
Hb	Hemoglobin
HCC	HIV Care Clinic
HIV	Human immunodeficiency virus
HTS	HIV testing services
IAC	Intensive adherence counselling
IEC	Information, Education and Communication
IM	Intramuscular
IMAM	Integrated management of acute malnutrition Integrated Management of
IMCI	Childhood illness
INH	Isoniazid
INSTI	Integrase strand transfer inhibitor
IPT	Isoniazid preventive therapy
IRIS	Immune reconstitution inflammatory syndrome
ITN	Insecticide treated net
IV	Intravenous
KS	Kaposi sarcoma
LFT	Liver function test
LMHRA	Liberia Medicines and Health Products Regulatory Authority
LP	Lumbar puncture
LPV/r	Lopinavir/ ritonavir
MA	Medical Assistant
MCH	Maternal and child health
MNCH	Maternal newborn and child health
MDR-TB	Multi-drug resistant tuberculosis
MUAC	Mid-upper arm circumference
NACP	National AIDS and STI Control Program
NNRTI	Non-nucleoside reverse transcriptase inhibitor
NTP	NTP National TB Program
NRTI	Nucleoside reverse transcriptase inhibitor
NS	Non-standard (ART regimen)
NSAIDs	Non-steroidal anti-inflammatory drugs
NVP	Nevirapine
OPD	Out-patient Dept.
ORS	Oral rehydration solution
PCP	Pneumocystis carinii (jiroveci) pneumonia
PCR	Polymerase chain reaction
PEP	Post-exposure prophylaxis for HIV using antiretroviral medicines
PGL	Persistent Generalized Lymphadenopathy
PI	Protease inhibitor
PIFP	Provider initiated family planning

PMTCT	Prevention of mother to child transmission
PO	Per os
PrEP	Pre-exposure prophylaxis for HIV using antiretroviral medicines
PRS	Partner referral slip
PSHD	Presumed severe HIV disease
PTB	Pulmonary tuberculosis
PZA	Pyrazinamide
R	Rifampicin
RAL	Raltegravir
S	Streptomycin
SCMU	Supply Chain Management Unit
SP	Sulphadoxine / pyrimethamine
SRH	Sexual and Reproductive Health
SSRR	Stock status and requisition report
STI	Sexually transmitted infections
TB	Tuberculosis
TBT	Anti-tuberculosis treatment
TDF	Tenofovir disoproxil fumarate
TF	Therapeutic feeding
TPT	Tuberculosis preventive therapy
VIA	Visual inspection (of the cervix) with acetic acid
VL	Viral load
3-HP	3-months of weekly isoniazide/rifapentine TPT regimen

1 Summary of 2020 policies

- All persons tested positive for HIV should start ART as soon as possible for their own health and to reduce the chance of transmission. Liberia has adopted the WHO recommendation for HIV testing and immediate treatment of those tested positive (Test and Treat.)

- Advanced HIV-related diseases can occur even in patients with high CD4 count (>500). Immediate ART reduces the chance of developing illness or advancing with an existing one.

- ART for people living with HIV is the most effective prevention method because ART when correctly taken leads to very low levels of virus in the blood and in body fluids (viral suppression). Viral suppression greatly reduces the risk of sexual or mother-to-child transmission.

- Liberia is currently implementing ARV regimen transition from an efavirenz and nevirapine-based regimen to a dolutegravir (DTG)-based ART regimen. DTG is more potent, more durable and cause fewer side-effects and interactions with other medicines.

- Pediatric ART is optimized with protease and integrase strand transfer inhibitors to phase out NNRTI-based regimen (starting with nevirapine-based regimen.) This is to minimize the risk of resistant HIV virus in children from previous exposure in mothers that were on TLE and during infant ARV prophylaxis in PMTCT.

- Differentiated Service Delivery in ART is introduced to maximize quality of care and improve retention.

- Hepatitis B and C co-infection with HIV has been observed among a good number of PLHIVs. Guidance has been provided for their management.

2 Overview of HIV, AIDS and HIV Services

AIDS (Acquired Immune Deficiency Syndrome) is caused by HIV (Human Immunodeficiency Virus). The first case of HIV was identified in Liberia in 1986. There are two main strains of HIV- HIV-1 and 2. Both strains have the same modes of transmission through contact with blood and body fluid (mainly through sexually intercourse, use of unscreened blood transfusion, sharp objects and from mother to child). Currently, about 40,000 persons are living with the virus in Liberia. National prevalence of HIV within the general population is 1.2%.[1] Key populations mostly affected by HIV in Liberia are: Gay men and other men who have sex with men, with HIV prevalence of 19.8%, Female sex workers with a prevalence of 9.8% and People who inject drugs, with HIV prevalence of 3.9%[2] and transgender people.

Once HIV enters the body, it infects many CD4 cells and replicates rapidly, resulting in a fall in the number of the cells and compromising the immunity of the infected individual. Most illness in HIV infection is caused by opportunistic infections occurring when the body's defenses are low, and not by the HIV virus itself. Therefore, opportunistic infections should be aggressively treated while considering ARV treatment. The WHO staging system for HIV infection recognizes HIV disease progression, as the immunity level falls.

Providing Sustainable HIV Services

HIV services are best offered in an integrated fashion at every service delivery station within the health facility. Table 1 on the next page outlines the HIV interventions to be offered at various service delivery points. Refer to the page number for details on how to deliver the specific intervention.

ART Clinic for Mother and Child (HIV Care Clinic - HCC)

- HCC is an integration in the same clinic setting for:
    - HIV exposed children
    - ART
- HCC services should be established in ART and Maternal, Newborn and Child health (MNCH) clinics.
- HCC is designed to facilitate clinical monitoring, preventive services and ART for family members affected by HIV.
- Make family appointments to encourage family members to attend together for HIV services.
- Family members can be seen in the consultation room at the same time or seen individually if there are sensitive issues to discuss.

[1] Liberia Demographic Health Survey 2013

[2] Integrated Bio Behavioral Surveillance Survey 2013

Table 1: Integrated Provision and Scheduling of Clinical HIV Services

Interventions that are provided only under special circumstances are marked with brackets (●)

HIV Service	*Page*	Schedule	OPD	In-Patients	Fam Plan Clin	ANC	Maternity	Postnatal Clin.	U5 Clinic/EPI/Nutrition	Exp Child FUP	ART Clinic	TB Clinic
Diagnosing HIV Infection and Exposure	*6*	Ascertain status at each visit	●	●	●	●	●	●	●	●	(●)	●
Common HIV-related diseases and their management	*13*	When diagnosed	●	●		(●)	(●)		●	●	●	●
Provider initiated family planning (PIFP)	*31*	At every scheduled visit									●	
Cotrimoxazole preventive therapy (CPT)	*32*	At every scheduled visit				●	●			●	●	●
TB preventive therapy (TPT)	*33*	Dispense for 1, 2 and then 3 monthly									(●)	
Starting ART	*48*	As soon as possible				●	●	●			●	●
Preparations for, and during ART	*51*	Monthly for the 1st 6 months; 3 monthly thereafter	(●)			●		●			●	●
Management of labor and delivery	*75*	On admission					●					
Newborn care and postnatal	*76*	After delivery					●	●				
Initiating integrated mother/infant follow-up	*76*	At first opportunity when mother known HIV+				●	●	●	●		●	
Infant NVP prophylaxis	*77*	At first opportunity when mother known HIV+				●	●	●	●	(●)		
Post-exposure prophylaxis (PEP)	*79*	As soon as possible after risk exposure	●				●					

3 Approach to PMTCT

NACP: Important Points to Note

- Multiple strategies are available to prevent the transmission of HIV from mother to child and to reduce the HIV burden among mothers and their children.
- These strategies are grouped into the ***4 Prongs of the national PMTCT*** program.
- Implemented together, these strategies have resulted in a drastic reduction of HIV infections among children. Further scale-up is expected to virtually eliminate new pediatric HIV infections and AIDS deaths among children.
- Key interventions from all 4 PMTCT prongs are covered in these guidelines, but some medical and non-biomedical interventions are beyond the scope of this document and are covered in separate guidelines.

Prong 1: Primary prevention of HIV infection in adults and adolescents

- Behavior change communication to reduce risky sexual contacts
- Provision of condoms, with education for correct and consistent use
- Provider initiated family planning (PIFP)

- Scale-up of HIV testing in high-yield settings for early diagnosis and ART referral. Multi-point HIV testing and counselling, including the family planning clinic should be prioritized.
- ART provision for all HIV infected adults and children, (regardless of CD4 count and/or clinical stage) to reduce morbidity and mortality and to prevent onward transmission
- Viral load monitoring and timely switch to appropriate regimen for patients on ART to ensure viral suppression and to reduce the risk of onward transmission
- Post-exposure prophylaxis (PEP)

Prong 2: Prevention of unintended pregnancies among HIV positive women

- Provider initiated family planning in ART clinics

Prong 3: Preventing transmission of HIV from infected women to their children

- Provider initiated testing at MNCH settings for early HIV diagnosis and ART initiation. (Liberia is introducing the HIV-Siphilis Duo rapid test kit for ANC women (See Liberia revised HTS guidelines 2020)
- HIV status ascertainment at maternity
- Initiation of lifelong ART for all HIV infected pregnant and breastfeeding women (regardless of CD4 count and/or clinical stage- option B plus)
- Safe obstetric practices
- Provision of infant nevirapine prophylaxis
- Infant feeding advice to reduce the risk of transmission through breast milk

Prong 4: Care, treatment and support for HIV-infected women and their children and families

Refer to ART sections.

4 Diagnosing HIV Infection and Exposure

NACP: Important Points to Note

- Goals of the Liberia HIV testing program:
    1. Identify as many HIV infected people as possible.
    2. Identify them **as early as possible** after getting infected.
    3. Ensure they start ART as soon as possible.
- Additional goal is to link HIV negatives to appropriate prevention services and to encourage retesting based on the client risk assessment.
- **Provider Initiated Testing:** Connect all patients attending health services to know their HIV status from all service delivery points.
- Remind patients during pre-test education (group or individual) that they can decline HIV testing without any 'fear of punishment' by the health worker.
- Practice index testing by encouraging all patients to attend HIV testing with their sexual partner, or connected with a partner referral slip (PRS). Ensure that all children, regardless of age (including adolescents), of HIV infected parents are tested, or connected with a family referral slip (FRS). Ensure all siblings of HIV-infected children have been tested.
- Enroll all children born to and/or breastfeeding from HIV infected mothers (*'HIV exposed children'*) in the HIV Care Clinic and follow to at least age 24 months or longer if breastfeeding continues.
- From age 12 months, over 95% of children with a positive HIV rapid test are truly HIV infected. Therefore, rapid testing should be used to diagnose HIV infection and HIV positive children started on ART from age 12 months.
- All children under 12 months of age with confirmed HIV antibodies, and presenting with conditions that constitute *Presumed Severe HIV Disease* (PSHD, see section 4.3). These patients need to start ART without delay.
- All patients need a confirmatory HIV rapid test to rule out any possibility of mix-up of test results or fraudulent access to ART.
- All children under 24 months who start ART need a confirmatory DNA-PCR using a new DBS sample. This should be collected on the day of starting ART (See Liberia HIV Testing Services Guidelines).

4.1 Verifying HIV status for children and adults

- Ask every client at every visit about the most recent HIV test and review their patient chart for previous HIV test results.
- Offer HIV testing to all patients attending health facilities for any reason if the patient:
    - has never been tested
    - tested negative more than 3 months ago (follow risk assessment guidelines)
    - claims to have been tested any time in the past, but without documentation (being on ART counts as documented evidence)
- Routinely document HIV test results on the patient's record. For in-patients, also document test result in in-patient notes.
- Consent for testing for minors (<14yrs) (See Liberia HIV Testing Services Guidelines for details).
- Identification of HIV exposure for adults, adolescents and children > 24 months should be provided using the HTS algorithm in the HTS guidelines.

4.2 Verifying HIV status for children under 24 months

- Routinely ascertain the mother's HIV status for all children under 24 months of age seen at the U1 / U5 clinic, EPI regardless of whether the child is healthy or sick:
    - Review mother's health card – if available for the latest HIV test result
    - Initiate a new HIV rapid test:
        - For the <u>mother</u>:
            - If she is not known to be positive and has not been tested at delivery or thereafter.
            - If the mother is not available.
        - For the <u>child:</u>
            - If the mother is not available / has died, perform test. If negative and the child is <12 months or was breastfeeding up until the mother's recent death, repeat test in 8 weeks (or 8 weeks after stopping breastfeeding).
            - If the child is sick, even if the mother was tested negative during pregnancy or delivery. Mothers may have been recently infected themselves and the risk of onward transmission to the child is very high under these circumstances.

Figure 1: Ascertainment of HIV exposure / infection in children under 24 months

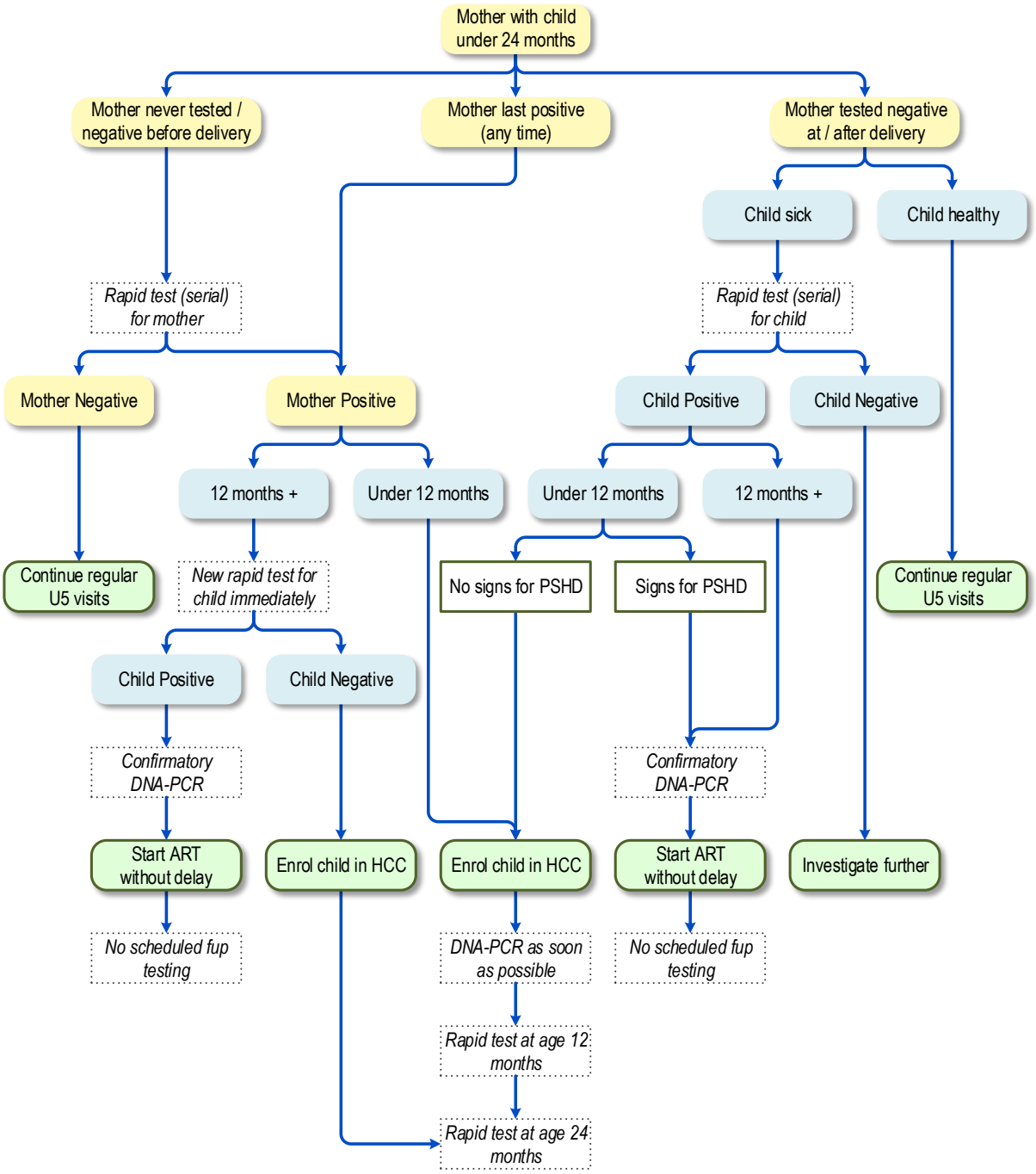


Table 2 shows the routine testing schedule for children under 2 years of age, the selection of the type of HIV test (DNA-PCR or rapid antibody test) depending on the child's age and the correct interpretation and action depending on the test result.

Table 2: Schedule of HIV testing in children: Choice of type of test, interpretation of results and follow-up management

Age (months)	Test	Schedule	Result	Interpretation	Action
Under 12	DNA-PCR (if available)	First opportunity from age 6 weeks	Negative	Not infected, but at risk of infection if breastfeeding	Continue HCC. Do rapid test at age 12 months.
			Positive	HIV infected	Start ART. Confirmatory DNA-PCR at ART initiation.
	Rapid antibody	Immediately if signs of PSHD identified ***OR*** If mother's HIV status cannot be ascertained	Negative	Not infected, but at risk of infection if breastfeeding from HIV+ mother	Treat condition. Continue HCC. Repeat rapid test at age 12 and 24 months.
			Positive	Possibly HIV infected if no PSHD symptoms	Enrol in HCC. Do DNA-PCR at first opportunity.
				Likely AIDS if symptoms for PSHD	Start ART. Confirmatory DNA-PCR at ART initiation.
12 to under 24	Rapid antibody	From age 12 months ***OR*** If mother's HIV status cannot be ascertained	Negative	Not infected, but at risk of infection if breastfeeding from HIV+ mother	Continue HCC, repeat rapid test at age 24 m.
			Positive	HIV Infected	Start ART. Confirmatory DNA-PCR at ART initiation.
24 and above	Rapid antibody	From age 24 months but ensure that BF stopped at least 6wks ago	Negative	Not infected	Discharge child from HCC.
			Positive	HIV Infected	Start ART. Confirmatory (parallel) rapid test at ART initiation.

4.3 Presumed severe HIV disease in infants (PSHD)

- Infants infected with HIV develop life-threatening HIV-related diseases much more quickly than older children and adults.
- It often takes too long to **confirm HIV infection** in a sick infant using **DNA-PCR**.
- Under the age of 12 months, a positive **HIV rapid antibody test does not confirm HIV infection** because maternal antibodies pass through the placenta and remain in the baby's blood for several months.
- However, a positive rapid antibody test in an infant with the following clinical signs makes **severe HIV disease** (AIDS) very likely:

Table 3: Definition of Presumed Severe HIV Disease (PSHD)

Infant with positive rapid antibody test PLUS:		
Combination of 2:	**OR**	**At least 1:**
• Oral thrush • Severe pneumonia • Severe sepsis		• Severe unexplained wasting / malnutrition not responding to treatment • Pneumocystis pneumonia • Candidiasis of esophagus, trachea, bronchi or lungs • Cryptococcal meningitis • Toxoplasmosis of the brain (from age 1 month)

- **Start ART** as quickly as possible for infants with PSHD – do not wait for a DNA-PCR result.
- Collect a DBS sample for DNA-PCR confirmatory testing on the day of starting ART (see Figure 2).

5 WHO Clinical Staging

NACP: Important Points to Note

- Untreated HIV infection leads to a gradual destruction of the immune system.
- Different HIV-related diseases appear at different levels of immune suppression.
- Most of these diseases can also occur in HIV negative patients, but they are a lot more common and more severe in HIV infected patients.
- Actively search and treat HIV-related diseases at ART initiation and at every follow-up visit. ART alone may not help the patient.
- HIV-related diseases are grouped into 4 WHO clinical stages that correlate with disease progression and prognosis of survival:
    - Stage 1: Asymptomatic
    - Stage 2: Mild
    - Stage 3: Advanced
    - Stage 4: Severe
- Most WHO stage defining conditions apply to all ages, but some are only for children under 15 years and others are only for adults.
- WHO clinical staging requires confirmed HIV infection.
- An infant aged under 12 months with only a positive HIV rapid antibody test can NOT be given a WHO clinical stage because HIV antibodies in infants do not confirm HIV infection.
- WHO clinical staging is mandatory for all HIV patients, regardless if a CD4 count is available.

Table 4: WHO Clinical Staging for Children and Adults with confirmed HIV infection and definition of Presumed Severe HIV Disease for Infants

	Adults and Children	Adults only (15 years or older)	Children only (below 15 years)
1	• Asymptomatic • Persistent generalized lymphadenopathy		
2	• Respiratory tract infections, recurrent (sinusitis, tonsillitis, otitis media, pharyngitis) • Herpes zoster • Angular cheilitis • Oral ulcerations, recurrent • Papular pruritic eruptions / Fungal nail infections	• Moderate weight loss <10%, unexplained • Seborrhoeic dermatitis	• Hepatosplenomegaly, persistent unexplained • Lineal gingival erythema • Wart virus infection, extensive • Molluscum contagiosum, extensive • Parotid enlargement, persistent unexplained
3	• Fever, persistent unexplained, intermittent or constant, >1 month • Oral hairy leukoplakia • Pulmonary tuberculosis (current) • Tuberculosis (PTB or EPTB) within the last 2 years • Anemia, unexplained < 8 g/dl • Neutropaenia, unexplained < 500 /mm^3 • Thrombocytopaenia, chronic < 50,000 /mm^3	• Severe weight loss >10% and/or BMI <18.5kg/m^2, unexplained • Diarrhea, chronic (>1 month) unexplained • Oral candidiasis • Severe bacterial infections (pneumonia, empyema, pyomyositis, bone/joint, meningitis, bacteremia) • Acute necrotizing ulcerative stomatitis, gingivitis or periodontitis	• Moderate unexplained wasting / malnutrition not responding to treatment (weight-for-height/ -age 70-79% or MUAC 11-12cm) • Diarrhea, persistent unexplained (14 days or more) • Oral candidiasis (from age 2 months) • Acute necrotizing ulcerative gingivitis or periodontitis • Lymph node tuberculosis • Bacterial pneumonia, severe recurrent • Symptomatic lymphoid interstitial pneumonitis • Chronic HIV-associated lung disease including bronchiectasis
4	• Pneumocystis pneumonia • Candidiasis of esophagus, trachea, bronchi or lungs • Extrapulmonary tuberculosis • Kaposi's sarcoma • HIV encephalopathy • Cryptococcal meningitis or other Extrapulmonary cryptococcosis • Disseminated non-tuberculous mycobacterial infection • Cryptosporidiosis, chronic with diarrhea • Isosporiasis >1 month • Disseminated mycosis (coccidioidomycosis or histoplasmosis) • Symptomatic HIV-associated nephropathy or cardiomyopathy • Progressive multifocal leukoencephalopathy • Cerebral or B-cell non-Hodgkin lymphoma	• HIV wasting syndrome (severe weight loss + persistent fever or severe weight loss + chronic diarrhea) • Bacterial pneumonia, recurrent severe • Chronic herpes simplex infection (orolabial, genital / anorectal >1 month or visceral at any site) • Cytomegalovirus infection (retinitis or infection of other organs) • Toxoplasmosis of the brain • Non-typhoidal Salmonella bacteremia, recurrent • Invasive cancer of cervix • Leishmaniasis, atypical disseminated	• Severe unexplained wasting / malnutrition not responding to treatment (weight-for-height/ -age <70% or MUAC <11cm or edema) • Bacterial infections, severe recurrent (empyema, pyomyositis, bone/ joint, meningitis, but excluding pneumonia) • Chronic herpes simplex infection (orolabial or cutaneous >1 month or visceral at any site) • Cytomegalovirus infection: retinitis or other organ (from age 1 month) • Toxoplasmosis of the brain (from age 1 month) • Recto-vaginal fistula, HIV-associated **Presumed Severe HIV Disease in infants <12 months *(PSHD)*** Positive antibody (rapid) test *PLUS* one or several of the highlighted clinical conditions in the WHO staging list *OR* combination of at least 2 of the following: • Oral thrush • Severe sepsis • Severe pneumonia

6 Common HIV-related diseases and their management

NACP: Important Points to Note

- TB and cryptococcal meningitis are by far the most common cause of morbidity and mortality among PLHIV in West Africa. Routinely screen all PLHIV at risk of advanced illness with urine LAM and serum CrAg screening (where available).
- Eligible patient groups include:
    - CD4 < 200 cells/ml
    - WHO stage 3 or 4 before ART initiation
    - "Seriously ill" PLHIV:
        - All PLHIV admitted as in-patient
        - HIV infected patients with any of the following danger signs:
            - Adults: ≥30 breaths/min; heart rate ≥120 beats/min; unable to walk unaided; ≥39°C
            - Children: lethargy; unconsciousness; convulsions; unable to drink or breastfeed; repeated vomiting; fever ≥39°C; tachycardia; tachypnea
- Urine LAM result
    - **Positive:** treat for TB, regardless of other TB diagnostics
    - **Negative**: does not rule out TB. Continue with TB investigations according to TB guidelines.
- Serum CrAg
    - **Positive:** assess for active meningitis signs, treat for active meningitis or give pre-emptive antifungal therapy (see sections6.1.1 and 6.1.2).
    - **Negative:** does not rule out CM. Continue with CSF testing (CrAg, India ink, Xpert) and other investigations for patient with meningitis signs.

6.1 Outline of Management of HIV-related Diseases

6.1.1 Cryptococcal meningitis

Clinical signs

Slow onset severe headache; confusion; convulsions; +/- fever; +/- neck stiffness

Diagnosis / investigations

Lumbar puncture (LP) feasible / not contraindicated

Cryptococcal antigen (CrAg) rapid test or India Ink stain on CSF.

LP not feasible

CrAg rapid test on serum, plasma or full blood.

Primary management

Admit

Daily therapeutic spinal tap if high intracranial pressure, severe headache or vomiting is present (up to 30 ml per puncture).

If not already on ART, start ART only 5 weeks after antifungal treatment initiation.

Induction phase

Do **not** give adjunctive corticosteroids during induction treatment

Option 1: Ampho B + Flucytosine for 7 days

Preferred option if both meds are available

Amphotericin B[3]

1mg/kg IV over 6 hours 24-hourly

Flucytosine tabs

100mg/kg/day divided into 4 doses (6-hourly)

Option 2: Fluconazole + Flucytosine for 14 days

This option requires FBC monitoring: at baseline and 2-3 times in the second week of treatment

Fluconazole tabs

Adult: 1200mg 24-hourly

Child: 12mg/kg (max 800mg) 24-hourly

Flucytosine tabs

100mg/kg/day divided into 4 doses (6-hourly)

Option 3: Ampho B + Fluconazole for 14 days

This option requires FBC, Crea and K+ monitoring: at baseline and 2-3 times in the second week of treatment

Amphotericin B[1]

1mg/kg IV over 6 hours 24-hourly

Fluconazole tabs

Adult: 1200mg 24-hourly

Child: 12mg/kg (max 800mg) 24-hourly

Consolidation phase

Fluconazole tabs for 8 weeks

Adult: 800mg 24-hourly

Child: 12mg/kg (max 800mg) 24-hourly

Maintenance phase

Fluconazole tabs, lifelong

Adult: 200mg 24-hourly

Child: 6mg/kg 24-hourly

6.1.2 Cryptococcemia

Clinical signs

Often no clinical signs

Diagnosis / investigations

CrAg rapid test positive. Assess for meningitis signs. If positive, do full investigation and treatment for CM (see **section 6.1.1**)

Primary management

Fluconazole tablets

800 mg 24-hourly for 2 weeks *then*
400 mg 24-hourly for 8 weeks *then*
200mg 24-hourly for life

6.1.3 Toxoplasmosis

Clinical signs

New convulsions, possibly reduced consciousness, focal neurological symptoms

Only seen in patients with CD4 below 200 cells/ml

[3] Before giving **Amphotericin B**: Pre-hydrate and supplement electrolytes: 1000ml NS + Potassium 2 tabs 12-hourly + Magnesium trisilicate 2 tabs 12-hourly.

Do not combine **Amphotericin B** with **TDF-based** ART (5A, 6A, 7A, 10A, 13A). Substitute for ABC-based regimen if already on ART. If not already on ART, start ART only 5 weeks after antifungal treatment initiation.

Diagnosis

Ring-enhancing lesions on contrast CT scan if available, but don't delay treatment if clinical signs are present and CT not available

Primary management

Cotrimoxazole tablets 960 mg
4 tabs 12-hourly for 6 weeks **then**
2 tabs 12-hourly for 3 months **then**
1 tab 12 hourly as lifelong prophylaxis

Response to this treatment in 7-10 days makes toxoplasmosis very likely

Secondary management

If cotrimoxazole is not tolerated

Clindamycin tablets
600mg 6-hourly for 3-6 weeks
+
Pyrimethamine tablets
100 mg 24-hourly for 3-6 weeks

6.1.4 Oral candidiasis

Clinical Signs

Multiple whitish or red patches anywhere inside mouth

Primary Management

Nystatin oral suspension
Treat for 7-14 days; keep in mouth as long as possible; apply to mother's nipples if breastfeeding
Adult: 4ml 6-hourly
Child: 1ml 6-hourly

Secondary Management

2 Alternative treatment options if severe or no response to nystatin:

Fluconazole tablets
Treat for 14 days
Adult: 100 mg 24-hourly
Child: 6mg/kg on day 1 then 3mg/kg daily

Miconazole gum patch or gel
Use for children > 4 months and adults
Treat with 1 patch 24-hourly for 14 days

6.1.5 Esophageal candidiasis

Clinical signs

Retrosternal pain on swallowing; infants and children refusing to eat; +/- oral thrush

Primary management

Fluconazole tablets
Treat for 14 days
Adult: 200mg 24-hourly for 14 days
Child: 12mg/kg day one then 6mg/kg

6.1.6 TB

Clinical signs

Very variable depending on organs affected. Persistent fever / drenching night sweats; weight loss; failure to thrive; cough; anemia <8g/dl; enlarged nodes; meningitis signs

Diagnosis / investigations

Often difficult to confirm in HIV+ patients. (Presumptive) TB case in household? 2x sputum for GeneXpert

Also consider for GeneXpert: ascites, CSF, lymph gland material, pleural or pericardial fluid

Chest X-ray; fine needle aspiration nodes (for microscopy); pleural tap for biochemistry: straw colored effusion? Lumbar puncture: CSF for biochemistry, microscopy

Primary management

1st Line TB treatment
Don't delay empirical TB treatment in severely ill HIV patients with presumptive TB

Category 1: New smear-positive or negative PTB:
Intensive phase: 2 RHZE
Continuation phase: 4 RH

Category 1: TB Meningitis:
Intensive phase: 2 SRHZ + prednisolone
Continuation phase: 10 RH

Category 2: Relapse/ return after default/ treatment failure/ recurrent TB
Regimen according to drug-susceptibility testing.

Secondary management

MDR-TB
Specialized treatment (see NTP guidelines)

6.1.7 Pneumonia

Clinical signs

Productive cough; chest pain; fever; tachypnea / dyspnea

Diagnosis / investigations

Infiltrations on CXR

Primary management

Child:

Mild: Tachypnoea but no dyspnea

(See IMCI guidelines)
Adult:

Mild to moderate presentation:

Amoxicillin tablets
500mg 8-hourly for 5 days
Doxycycline 100mg or Erythromycin 500mg 8-hourly for 5 days if no response

Secondary management

Severe presentation:

Ceftriaxone 2g IV + Erythromycinor doxycycline
Add Gentamycin if no response

6.1.8 Pneumocystis carinii (jiroveci) pneumonia (PCP)

Clinical signs

Extreme shortness of breath; dry cough; +/- fever

Severe pneumonia in infants <12 months

Diagnosis / investigations

O_2 saturation: hypoxia

CXR: Diffuse interstitial or hyperinflation; bats wing shadow

Treat empirically for PCP any HIV exposed or confirmed infected infant presenting with severe pneumonia

Primary management

Admit
Oxygen
Cotrimoxazole tablets
Adult: 4 x 480mg 8-hourly for 21 days
Child: 80mg/kg 8-hourly for 21 days
Lifelong maintenance (CPT)
IV Cotrimoxazole if unable to swallow and NGT impossible to place

Prednisolone tablets:
Give only if patient is hypoxic / in respiratory distress.
Give 15-30 minutes before cotrimoxazole
Adult: 8 tablets 12-hourly for 5 days
8 tablet 24-hourly for 5 days
4 tablets 24-hourly for 11 days
Child: 2mg/kg 24-hourly for 7 days
1mg/kg 24-hourly for 7 days
0.5mg/kg 24-hourly for 7 days

Secondary management

Clindamycin
600mg 8-hourly for 3 weeks
plus
Primaquine
30mg 24-hourly for 3 weeks

6.1.9 Sepsis

Clinical signs

Severe illness; fever (can be absent, especially in children); fast heart rate; fast breathing

Diagnosis / investigations

+/- Malaria parasites; do not rule out sepsis if malaria parasites are seen; blood culture for culture and sensitivity (if available)

Primary management

Health Centre Level:

Immediate presumptive treatment
Referral to hospital
Child:

Benzyl Pen 50,000 IU/kg IV or IM stat +
Gentamycin 7.5mg/kg slow IV / IM stat +
Quinine 10mg/kg IM stat
Adult:

Chloramphenicol 1g IV or IM stat +
Gentamycin 240mg slow IV or IM stat +
Quinine 1200mg IV in 5% dextrose over 4 hours

Secondary management

Hospital management:

Neonate:

Benzyl Pen 50,000 IU/kg IV 8-hourly +
Gentamycin 7.5 mg/kg IV 24-hourly
Child:

Gentamicin 7.5.mg/kg 24-hourly + **Benzyl Pen** 50,000 IU/kg IV 8-hourly
OR
Ceftriaxone 50-100 mg/kg IV 24-hourly
OR (if pneumococcal sepsis suspected)

Chloramphenicol 25 mg/kg IV 8-hourly (max. 1g per dose)

When stable continue to complete 10 days:
Amoxicillin 50 mg/kg (total daily dose), divided into 3 doses given 8-hourly +
Ciprofloxacin 15 mg/kg 12-hourly

Adult:

Ceftriaxone 2g IV 24-hourly

When stable continue to complete 10 days:
Ciprofloxacin 750 mg tablets 12-hourly +
Amoxicillin 500 mg tablets 8-hourly

6.1.10 Kaposi sarcoma

Clinical signs

Single or multiple purple patches or nodes, mainly mouth, skin, conjunctiva, lung, GI tract; +/- enlarged lymph nodes; +/- edema / pleural effusions

Children: often no skin lesions, only edema and non-localized adenopathy.

Diagnosis / investigations

Usually clear picture; consider KS even without skin or oral lesions if no response to EPTB therapy within 4 weeks (adults).

Children: Look for woody edema (hard, firm swelling) in the inguinal area / legs; facial edema (rule out kidney disease, malnutrition); lesions in mouth / palate / subcutaneous.

Primary management

ART, analgesia, symptomatic treatment:
For all patients

Delayed chemotherapy:

For KS stage T0 (adults with only skin KS without edema). Start chemotherapy only if no improvement after 3 months on ART.

Immediate chemotherapy:
For KS stage T1 (any pediatric KS and adult KS in mouth or internal organs, nodular skin KS, skin KS with edema)

Chemotherapy 1st choice: paclitaxel IV

Paclitaxel vials must be refrigerated. Remainder can be kept in fridge for next dose.

Give Chlorpheniramine tab 4mg 30-60 min before paclitaxel. Monitor for allergy / anaphylaxis (rare). Do not pre-medicate KS patients with corticosteroids.

Monitor FBC and LFT at baseline and before every paclitaxel infusion. Transfuse before paclitaxel if Hb<7g/dl.

Monitor clinically for hepatitis.

Dosing and administration
Dose is based on body surface area m^2 (BSA). Read BSA from Figure 8 based on weight and height.

Dose can be rounded to nearest 5mg.

Dilute in 500ml NS, slow IV infusion. Wear protective gloves and gown when preparing.

Regimen 1: Medium dose paclitaxel

100mg/m^2 over 3 hours every 2 weeks. Usually 6-8 cycles. Continue until max. response, no active disease. Stop if severe side-effects.

Regimen 2: Low dose paclitaxel
25mg/m^2 over 1 hour weekly for 8 weeks. For very sick patients or those not tolerating Option 1.

Regimen 3: High dose paclitaxel
135mg/m^2 over 3 hours every 3 weeks. Continue until max. response, no active disease. Stop if severe side-effects. Alternative for patients in better condition who can only manage less frequent visits. Dose does not work well for many vial sizes.

Chemotherapy 2nd choice: bleomycin + vincristine

Ensure strictly IV injection as infiltration causes burns; document therapy and response in health passport; examine for recurrence at every visit.

Adult: 2 mg (1.5 mg/m^2) vincristine IV + 25 units (15 units/m^2) bleomycin IV
Child: 0.05 mg/kg vincristine IV (max 2mg) + 0.5 mg/kg bleomycin IM

Review after every cycle:
- Severe neuropathy / constipation: stop vincristine
- Sign for lung fibrosis (incl. cough, shortness of breath): stop bleomycin.
- Cumulative max. life time dose for bleomycin is 400 units (maximum 16 doses)
- Lesions cleared: stop treatment
- Good response but residual lesions: continue next cycle
- Poor response: Refer for secondary management.

Secondary management

Oncology department

Doxorubicin or other drugs may be used according to oncology protocols.

6.1.11 Lymphoma

Clinical Signs

Swollen lymph nodes, loss of weight, low-grade fever, night sweats, anemia

Consider lymphoma if treatment for suspected lymph node TB shows no improvement after 4 weeks.

Management

Refer for lymph node biopsy, Management in Oncology department

6.1.12 Cervical (pre-) cancer

Clinical signs

Possibly vaginal discharge, but often no early symptoms.

HIV infected women are at high risk of cancer from human papilloma virus co-infection. Screen actively every 12-24 months.

Diagnosis / investigations

Acetic acid visualization (VIA)

Use good light source.
Expose cervix with Cusco speculum.
Apply 4% acetic acid to cervix with large cotton swab for 2 minutes.
Inspect cervix.

Primary management

Depending on stage (see Cervical Cancer Screening Guidelines)
Pre-cancer
Cryotherapy or thermo-coagulation of pre-cancerous lesions can be done immediately after VIA.

Cervical cancer
Refer to tertiary care level for advanced treatment options or palliative care.

6.1.13 Herpes zoster (shingles)

Clinical signs

Grouped blisters in one patch; intense pain / burning; +/- fever; +/- body pains; lesions do not usually cross the body's mid-line

Primary management

Analgesic Ladder
Rigorous pain control
Acyclovir tablets
Must be started before blisters burst
Adult: 800mg 5 times per day for 7 days
Child: 20 mg/kg 8-hourly for 7 days
If face affected:
Refer to Eye specialist
Monitor for secondary bacterial infection

6.1.14 Seborrheic dermatitis

Clinical signs

Greasy, scaly rash in axilla, groin, scalp, neck, face

Primary management

Clotrimazole or Miconazole cream / ointment

Hydrocortisone 1% cream/ointment

Secondary management

Ketoconazole tablets
200 mg twice daily for 7 days
Flucloxacillin or Erythromycin
500mg 6-hourly for 7 days

6.1.15 Tinea corporis / cruris / pedis

Clinical signs

Round reddened plaques with scaly edge in multiple sites, poss. widespread

Primary management

Whitfield's ointment
Clotrimazole cream or Gentian-Violet paint
Apply twice daily for 3-4 weeks

Secondary management

Griseofulvin tablets
Adult: 500 mg 12-hourly for 4-6 weeks
Child: 20mg/kg per day for 4-6 weeks

6.1.16 Pruritic papular eruptions

Clinical signs

Severe itching, evenly distributed normal- or dark-colored papules on trunk, arms or legs, often scratch-lesions

Primary management

Calamine Lotion
Antihistamines

Secondary management

Corticosteroid cream

6.1.17 Chronic diarrhea

Clinical signs

More than 3 loose non-bloody motions per 24 hours for more than 4 weeks (adults) or 2 weeks (children)

Diagnosis / investigations

Based on response to stepwise empirical treatment:

Step 1 treats: isospora, cyclospora, bacterial

Step 2 treats: giardia, clostridium, amoeba, microsporidium

Step 3 treats: microsporidium, helminths

Primary management

Effective ART
Confirm VL suppression, do targeted CD4; consider if LPV/r is causing the diarrhea.
ORS
drink 5ml/kg 4-hourly and after every episode of diarrhea.
drink 5ml doses every 5 min if vomiting occurs
IV Fluids
if severe de-hydration
Loperamide tablets
Adult: 2mg after every loose stool (max 12mg in 24 hours)
Child: Do NOT use for children
Step 1: Cotrimoxazole tablets
Adult: 960mg 8-hourly for 7 days
Child: 80 mg/kg 8-hourly for 7 days
Zinc tablets
Give for 10 days
Child 0-6mths: 10 mg 24-hourly
Child 6mths – 5 yrs: 20 mg 24-hourly

Secondary management

Continue with step 2 and 3 if no improvement

Step 2: Metronidazole tablets
Adult: 750mg 8-hourly for 7 days
Child: 15mg/kg 8-hourly for 7 days

Step 3: Albendazole tablets
Adult: 400mg 12-hourly for 6 months

6.1.18 Genital ulcer disease

Clinical signs

Skin ulcer and/or blisters on genitals with or without pain

Diagnosis / investigations

History, examination

Primary management

Emphasize importance of completing treatment

Avoid sex without condom until treatment complete, give min. 30 condoms

Give referral slip to treat partner

Benzathine Penicillin
2.4 Million Units IM stat
Ciprofloxacin tablets
500 mg 12-hourly for 3 days
Acyclovir tablets
800 mg 8-hourly for 2 days

6.1.19 Urethral discharge

Clinical signs

Turbid discharge from urethra, usually with pain when passing urine

Diagnosis / investigations

History, examination

Primary management

Emphasize importance of completing treatment

Avoid sex without condom until treatment complete, give min. 30 condoms

Give referral slip to treat partner

Gentamicin 240 mg IM stat

Doxycycline tabs 100 mg 12-hourly for 7 days

Metronidazole tabs 2 g stat

6.1.20 Abnormal vaginal discharge

Clinical signs

Vaginal discharge, unusual color / odor

Itching, pain / discomfort, pain when passing urine

Diagnosis / investigations

History, examination

Primary management

Emphasize importance of completing treatment

Avoid sex without condom until treatment complete, give min. 30 condoms

Give referral slip to treat partner

Gentamicin 240 mg IM single dose

Doxycycline tabs 100 mg 12-hourly for 7 days

In pregnancy: **Erythromycin tabs** 500 mg 6-hourly for 7 days

Metronidazole tabs 2g stat

6.1.21 Lower abdominal pain (Women, STI)

Clinical signs

Pain during sexual intercourse/ when passing urine/ around menses

Vaginal discharge / excessive bleeding at / between periods

Fever / nausea / vomiting

Diagnosis / investigations

History, examination

Primary management

Emphasize importance of completing treatment

Avoid sex without condom until treatment complete, give min. 30 condoms

Give referral slip to treat partner

Gentamicin 240 mg IM stat

Doxycycline tabs 100 mg 12-hourly for 14 days

Metronidazole tabs 400 mg 12-hourly for 14 days

7 Monitoring of HIV patients

7.1 Monitoring of nutritional status

- One of the simplest methods to detect HIV disease progression / ART failure.
- Investigate any patient with weight loss for TB
- Record length / height to the nearest cm at every visit (children) / once at enrolment (adults).
- Record weight in kg to the nearest 100g at every visit (children and adults).
- Use appropriate nutrition indicator for children and adults.

7.1.1 Children 0-14 years

- Classify and manage wasting / malnutrition status according to Integrated Management of Acute Malnutrition (IMAM) guidelines in Liberia.
- Watch out for flattening of the growth curve (weight for age).

7.1.2 Non-pregnant adults 15 years and above

- Classify nutrition status according to BMI. Use standard MOH job-aids.
- Watch out for any weight loss over time. Review documented previous weight whenever available as reported weight loss can be unreliable.
- BMI under 17: Start TF for 'moderate malnutrition'.
- BMI under 16: Start TF for 'severe malnutrition'.

7.1.3 Pregnant and lactating women

- Use MUAC instead of BMI.
- MUAC less than 22cm: start TF for 'moderate malnutrition'.
- MUAC less than 19cm: start TF for 'severe malnutrition'.

7.2 Standard clinical monitoring checklist

- Use the summary clinical monitoring checklist to actively screen every exposed child and ART patient for clinical symptoms at every clinical visit.
- Refer to Table 6 for more detailed screening instructions and interpretation of signs and symptoms for further management.

Table 5: Checklist for Clinical Monitoring of HIV Exposed Children and ART Patients

Ask for / Examine			
Appearance:	Weight loss / failure to thrive	N	Y
	Body shape change / breast swelling (men)	N	Y
	Swollen glands	N	Y
Headache / confusion / dizziness		N	Y
Yellow eyes		N	Y
Mouth sores		N	Y
Cough		N	Y
Shortness of breath		N	Y
Fever / night sweats		N	Y
Vomiting / abdominal pain		N	Y
Diarrhea		N	Y
Leg pain / numbness / weakness		N	Y
Rash on arms, legs or trunk		N	Y

Table 6: Detailed Clinical Monitoring List for HIV Exposed and ART Patients

Ask / Examine	Look for	Assess	Disease (most common)	Drug Side-Effects
Appearance	• Weight loss • Failure to thrive	• Weight loss: trend from patient card / health passport • BMI (adults) • Weight for height, weight for age, MUAC (children)	1) TB 2) Chronic diarrhea 3) Malnutrition 4) ART treatment failure 5) Malignancy (lymphoma)	**Lactic acidosis due to ART** 1) AZT
	• Breast swelling (men) • Body shape change	• Breast enlargement (gynecomastia) • Slimming of cheeks • Slimming of forearms, buttocks and legs +/- protruding veins • Fattening of chest / belly / buttocks • Buffalo hump		**Gynecomastia** 1) EFV **ART induced lipodystrophy** 1) AZT 2) 3TC
	Swollen glands	• Cervical / axillary lymphadenopathy	1) PGL 2) EPTB 3) Lymphoma 4) KS (+/- skin lesions) 5) BCG adenitis	
Headache, confusion, dizziness	• Neck stiffness • Nausea / vomiting		1) Meningitis (bacterial/ TB, cryptococcal) 2) Toxoplasmosis HIV dementia	1) EFV 2) INH 3) DTG

Ask / Examine	Look for	Assess	Disease (most common)	Drug Side-Effects
Yellow eyes	• Yellow sclera	• Jaundice	1) Viral hepatitis 2) Alcoholic hepatitis 3) Malaria 4) Cancer 5) Hep B-IRIS	**Drug hepatitis** 1) NVP 2) EFV 3) PZA 4) Rifampicin 5) INH 6) Fluconazole 7) DRV/r 8) ETV 9) DTG **Hyperbilirubinemia** 7) ATV/r
Mouth sores	• Mucosa lesions	• Whitish patches • Painful red patches	1) Oral thrush 2) Oral hairy leukoplakia	
		• Purple lesions	1) KS	
		• Ulcerations	1) Acute ulcerative stomatitis/ gingivitis/ periodontitis 2) Herpes simplex 3) Angular cheilitis 4) Aphthous ulcers	**Hypersensitivity** 1) ABC 2) NVP 3) EFV 4) ETV 5) Cotrimoxazole

Ask / Examine	Look for	Assess	Disease (most common)	Drug Side-Effects
Cough	• Duration • Productiveness	• Less than 2 weeks • Fever • +/- Productive	1) Pneumonia (bacterial) 2) TB suspect: circle on card 3) PCP	**Hypersensitivity** 1) ABC 2) DRV/r 3) ETV
		• More than 2 weeks • Fever / night sweats	1) TB suspect: circle on card 2) KS	
Shortness of breath	• Observe breathing • Pleural effusion	• Pleural effusion	1) EPTB 2) Bacterial pneumonia 4) KS	
		• No pleural effusion	1) Bacterial pneumonia 2) PCP 3) TB Pericarditis +/- pneumothorax 4) Heart Failure	**Lactic acidosis due to ART** 1) AZT
	• Conjunctiva	• Pale conjunctiva	1) HIV anemia 2) Chronic severe malaria 3) Nutritional anemia	**Anemia** 1) AZT

Ask / Examine	Look for	Assess	Disease (most common)	Drug Side-Effects
Fever / night sweats	• History / Duration • Current temperature	• Less than 1 month	1) URTI / viral 2) Sepsis 3) Malaria 4) TB	**Hypersensitivity** 1) ABC 2) NVP 3) EFV 4) RAL 5) ETV 6) DTG 7) Cotrimoxazole
		• More than 1 month	1) TB 2) Malignancies (lymphomas)	
Vomiting / abdominal pain	• Hydration status • Palpate abdomen	• Dehydration • Tenderness	1) TB 2) NTS sepsis 3) Acute Gastro-enteritis 4) Malaria 5) Abdominal TB 6) Ulcer disease 7) CNS disease 8) Malignancies	**Drug-induced pancreatitis** 1) 3TC 2) RAL 3) ETV 4) DTG **Lactic acidosis due to ART** 1) AZT
Diarrhea	• History • Blood in stool	• Less than 1 month	1) Salmonella E. Coli Amoeba, Shigella 2) HIV / OI	**GI toxicity** 1) LPV/r 2) NVP 3) AZT 4) ABC 5) 3TC 6) DTG Antibiotics: Pseudomembranous enterocolitis
		• Longer than 1 month	1) HIV / OI 2) Abdominal TB	

Ask / Examine	Look for	Assess	Disease (most common)	Drug Side-Effects
Leg pain, numbness, weakness	• History • Neurological exam	• Sleep disturbance (moderate) • Motor involvement (severe)	1) HIV peripheral neuropathy 2) spinal TB	**Drug neuropathy** 1) INH 2) AZT 3) Vincristine 4) Metronidazole
Rash on arms, legs and trunk	• Skin lesions	• Purple lesions	1) KS	
		• Blisters/ vesicles	1) Shingles/ varicella zoster	Stevens-Johnson Syndrome 1) NVP 2) Cotrimoxazole 3) RAL
	• Generalized rash	• Maculo-papular	1) HIV associated rash (PPE) 2) Fungal skin infections 3) Molluscum contagiosum 4) Scabies	**Skin toxicity** 1) NVP 2) EFV 3) CTX 4) Fluconazole 5) DRV/r 6) ETV 7) DTG

7.3 Laboratory Monitoring

7.3.1 CD4 count testing

- Do **routine CD4 count** and start ART if a CD4 machine is available at the site. However, do not delay ART initiation if CD4 machine is not functional, or if results are delayed, or testing is currently not available.
- Do **Targeted CD4 count** for patient on ART with suspected clinical and/or confirmed treatment failure.
    - CD4 <200 cells/ml: Do routine urine LAM and serum CrAg
    - CD4 200+ cells/ml: no specific action
- CD4 counts are the most direct routine measure for HIV immune suppression, but can be influenced by several factors:
    - Gender, time of day, physical exercise, pregnancy, smoking, etc.
- CD4 counts may fail or give wrong results unless the following protocol is used:
    - Collect a minimum of 2ml venous blood in tube with EDTA anticoagulant.
    - Immediately turn the tube upside down to mix the blood with EDTA. Do not shake vigorously.
    - The sample must be processed in the lab within 6 hours or 48 hours, depending on the type of machine used. (Refer Lab SOP for CD4 sample collection and logging).
    - Storing the tube at 2-8° C in the dark will extend the lifespan by a few hours.

7.3.2 DBS samples collection for EID and VL

NACP: Important Points to Note

- Diagnosing HIV infection in infants and virologic treatment failure is done by testing for HIV genetic material in a blood sample, using the polymerase chain reaction (PCR) method.
- PCR testing is only done in special labs, making it necessary to prepare dried blood spot (DBS) samples that can be kept at normal temperature for several weeks.
- Carefully follow the protocol when preparing DBS samples for EID and VL. They vary slightly.
- **Never** allow EID samples to **touch or mix** with VL samples as this will lead to false positive EID results:
    - Use separate rooms or at least separate tables within one room.
    - Allocate different staff for collection of DBS for EID and VL, and Use separate drying racks, clearly labelled ***EID*** and ***VL.***
    - Pack DBS for EID and VL in separate plastic bags and envelopes.
- See section 13.9.2 for VL results interpretation.

Table 7: Summary Protocol for Preparation of DBS Samples for EID and VL

	Early Infant Diagnosis (EID)	Viral Load (VL)	Caution
Getting ready	• Fill in the requisite sample collection form (EID/ VL) • Label DBS card with patient name, ID and date • Wash hands, put on gloves, (use powder-free gloves only)		• Hold the filter paper card only at the edges • Never touch the area near the circles
Sample collection	• Infants <9kg: select left or right side of the sole under the heel • Children under 2 years >9kg: select heel or side of big toe • From age 2 years and adults: select side of fingertip, preferably ring finger • Position down, warm up, squeeze intermittently		
	• Wipe with alcohol swab, dry for 30 sec • Press lancet on skin, prick, dispose into sharps bin • Wipe away first drop of blood with sterile gauze, wait for large drop of blood to appear		• Avoid excessive squeezing of heel / toe / finger
	• Fill each circle with one big drop of blood directly onto filter paper	• Dip capillary into blood drop and fill to black line (50 micro liters) • Hold tip of the capillary at a slight angle in the center of the circle on the filter paper	• Don't allow the finger / toe to touch the filter paper • Apply blood only on one side of filter paper • Don't rub or scratch filter paper with capillary
	• Let the blood soak into the paper to fill the whole circle • Repeat this procedure until all **5 circles** are filled		• Don't re-apply more blood to the same circle
Drying	• Slot filter paper into drying rack • Dry in protected area at room temperature for at least 3hrs (best over the night)		• Don't touch/ smear/ allow to touch other objects • Protect from sunlight, heat, dust, insects, rodents
Packing	• Put each filter paper card into a separate zip-lock bag • Put 3 sachets with desiccant into each zip-lock bag • Squeeze out air and seal zip-lock bag • Use marker pen to label the zip-lock bag and envelope, including **'EID'** or **'VL'** • Insert zip-lock bags and specimen forms into envelope and seal		• Don't pack filter paper cards before completely dried • Don't combine EID and VL samples in same envelope
Storage, transport	• Store envelopes in cool dry place		• Keep away from sunlight

8 Preventive services for HIV patients

NACP: Important Points to Note

- A simple standard package of preventive services is provided for all ART patients. This includes:
    - Provider Initiated Family Planning (at least condoms + non pill option)
    - Cotrimoxazole Preventive Therapy
    - TB Preventive Therapy
    - Insecticide Treated bed Nets
- This package effectively reduces:
    - HIV transmission to sexual partners
    - HIV transmission from mother to child by preventing unwanted pregnancies
    - Serious HIV-related diseases (TB, diarrhea, pneumonia, malaria, etc.)

8.1 Provider initiated family planning (PIFP)

- This is an aspect of the 2nd prong for preventing mother to child transmission of HIV (PMTCT).
- Assume that all patients aged 15 years and above are sexually active.
- Offer condoms to all men and women age 15 years and above.
- Offer counselling on contraceptive methods. Refer to FP clinic if this is not feasible in the HCC setting.
- Offer at least 1 non-pill long acting contraceptive method directly in the HCC (one-stop shop).
    - 1 Depo-Provera (depo-medroxyprogesterone acetate) injection every 3 months
    - Hormonal implants for three (3) to five (5) years
    - Intra uterine contraceptive device for 10 years
- Give patients the opportunity to refuse any method if they feel they don't need / want it.

8.2 Cotrimoxazole preventive therapy (CPT)

- CPT prevents PCP pneumonia, diarrhea, malaria and other HIV-related diseases and prolongs survival.
- Start all the following on CPT:
    - HIV exposed children from age 6 weeks
    - HIV infected children from age 6 weeks
    - HIV infected adults
- Continue CPT for life for all HIV positive patients.
- Stop CPT in HIV exposed children when confirmed negative after stopping of breastfeeding (when discharged from exposed infant follow-up).
- Provide CPT to all patients in HCC and ART follow-up.
- CPT is tolerated very well by most patients, can be taken at the same time with ART, TB treatment and IPT.
- CPT is safe in pregnancy.
- Do not combine CPT with SP – HIV positive pregnant women only take CPT (and ART).
- Children from 30.0kg and adults take one 960mg tablet of cotrimoxazole 24-hourly.
- Dispersible pediatric tablets (120mg) are used for children under 14.0kg. Dosing of pediatric CPT and ART are both based on the same weight bands.

Eligibility for CPT

- All infants born to HIV infected mothers (without confirmed HIV infection) from age 6 weeks:
    - Aim to start CPT straight after the infant has finished NVP syrup.
    - Note: start HIV-exposed infants on CPT even if they did not receive NVP prophylaxis.
    - Keep the infant on CPT until s/he is confirmed HIV-negative and is discharged from HCC follow-up (around age 24 months).
- Confirmed HIV infected children from age 6 weeks and adults:
    - No contra-indication against CPT in the first trimester of pregnancy.
    - Do not give SP to HIV infected pregnant women on CPT.
    - If SP has already been taken, wait for 14 days before starting CPT.

CPT contraindications

- Jaundice
- Renal failure
- Suspected allergy to any of the following sulphonamide drugs (skin rash, mucosal ulceration, severe anemia, leukopenia)
    - Cotrimoxazole
    - Sulfadoxine / Pyrimethamine (SP)

CPT dosage and duration

- See Table 11 for dosing.
- HIV exposed children: stop CPT when confirmed HIV negative at least 6 weeks after stopping of breastfeeding.
- HIV infected children and adults continue CPT for life, unless severe side effects develop.
- Poor adherence to CPT will reduce the effectiveness of preventing HIV-related diseases, but it is less risky than poor adherence to ART.

8.3 TB preventive therapy (TPT)

- There are several WHO and internationally recommended options for TPT: Isoniazid (daily administration for 6, 9, 12, 24 or 36 months; Isoniazid and Rifapentine (weekly, daily administration, for 1, 3 or 9-months).
- Liberia presently adopts daily IPT for 6-months, which can prevent active TB disease in people who are at high risk. Additional guidance notes shall be circulated by the NACP when the country moves over and procure stocks for IPT with 3-HP.
- Give IPT to the following:
    - HIV infected children and adults for 6-months
    - Children under 5 years – regardless of HIV status - who live with a patient with pulmonary TB (sputum smear negative or positive), for 6-months.
    - In all PLHIVs:
        - New patients: start IPT together with ART and CPT.
        - Patients already on ART: start IPT regardless of the time on ART.
- Give IPT regardless of previous TB treatment or prior use of IPT.
- IPT is well tolerated by over 95% of patients and most side effects are mild and disappear within the first 3 months, however, the safety of IPT in pregnancy is debatable and currently awaiting WHO guidance.
- Serious side effects are uncommon: hypersensitivity, neuropathy and severe hepatitis.

- Stop IPT if any of the following are seen:
    - Vomiting
    - Pellagra-type skin rash in sun-exposed areas and other severe skin rash
    - Yellow eyes
    - Dizziness / confusion / convulsions
    - Severe numbness/burning pain and muscular weakness of legs and/or arms
- Document reason for stopping IPT in patient case folder.Eligibility for IPT
- Rule out active TB with the standard screening questions below:
    - Current cough: any duration, productive or non-productive
    - Unexplained weight loss (adults)
    - Failure to thrive and/or malnutrition (children)
    - Fever and/or night sweat

IPT contraindications

- Suspected or confirmed active TB
- Active hepatitis, liver damage, heavy alcohol drinking
- Severe peripheral neuropathy

IPT dosage and duration

- See Table 11 for dosing.
- Give IPT during ART visits. One extra visit is needed 1 month after starting IPT.
- Review patients at month **1**, **3** and **6** after starting IPT for any side effects.
    - IPT initiation: Give INH and pyridoxine for 1 month.
    - 1 Month IPT review: Give INH and pyridoxine for 2 months.
    - From 3 Month IPT review: Continue giving INH and pyridoxine for 3 months.
- Give 1 tablet of pyridoxine 25 or 50mg 24-hourly to children and adults.
- Stop IPT after completion of 6-month; filled outcomes on the IPT register.
- Poor adherence to IPT will reduce the effectiveness of preventing active TB disease..

9 Understanding ART regimens and formulations

NACP: Important Points to Note

- ART requires combining **3 different ARVs** that act differently to avoid development of drug-resistant HIV.
- **1st Line regimens** are the best. Patients can remain on the same 1st line regimen possibly for life if they are fully adherent and virally suppressed.
- **2nd Line regimens** are offered for patients who have confirmed treatment failure on 1st line regimen (usually due to poor adherence in the past). Moving from 1st to 2nd line ART is called **switching**.
    - The appropriate 2nd line regimen is determined by the 1st line regimen that the patient was taking when failing.
- **3rd Line regimen** is a last resort for patients failing on second line. This requires confirmation of drug resistant virus using genetic analysis in the lab.
- DTG-based ART regimens have **important advantages**
    - More potent: rapid viral load suppression within weeks; more durable: high resistance barrier.
    - Convenient: small tablet taken once per day.
    - Better tolerated; fewer drug-interactions (see below): no interactions with hormonal contraceptives.
- (Relative) Contra-indications for DTG-based regimens:
    - Uncontrolled diabetes; renal failure: creatinine clearance <30ml/min
    - Severe liver damage: ascites; albumin <2.8g/dL; total bilirubin >50mmol/L; encephalopathy
    - Potential **side-effects** (rare): insomnia, headache, agitation, Nausea, diarrhea, Skin rash
- Important DTG drug-interactions:
    - Rifampicin (TB treatment): double daily DTG-dose
    - Drugs with iron, magnesium, calcium, zinc (FeFo, multi-vitamins, antacids, etc.): take 2 hours before or 6 hours after DTG
    - Metformin (diabetes): limit daily dose to 1000mg, confirm effective glucose control
    - NVP, ETR (ARVs): do not combine with DTG

9.1 Classification of individual ARVs

- Main classification is based on **mode of action** against HIV replication.
- Sub-classification is based on **biochemical structure** of the drug.
- Only ARVs with the same dosing interval are available as fixed-dose combinations.

Table 8: Classification of ARVs

Mode of action	Biochem. structure	Abbrev.	ARVs	Dosing interval
Reverse **T**ranscriptase **I**nhibitors	**N**ucleosides	***NRTI***	**AZT**	***12**-hourly*
			3TC, ABC	***12**- or **24**-hourly*
			TDF	***24**-hourly*
	Non-**N**ucleosides	***NNRTI***	**NVP**	***12**-hourly*
			EFV	***24**-hourly*
			ETV	***12**-hourly*
Protease **I**nhibitors		***PI***	**ATV/r**	***24**-hourly*
			DRV	***12**-hourly*
			LPV/r	***12**-hourly*
Integrase **S**trand **T**ransfer **I**nhibitor		***INSTI***	**DTG**	***24**-hourly*
			RAL	***12**-hourly*

9.2 Choosing ART regimen, formulation and dosage

9.2.1 Regimen names

- Regimens are numbered for ease of reference (see Table 10):
    - Regimen 0, 2, 4, 5, 6, 13, 14 and 15 are 1st line regimens, including alternative 1st line regimens.
    - Regimen 5 is the Efavirenz-based standard 1st line.
    - Regimen 13 is the Dolutegravir-based new standard 1st line regimen for PLHIV weighing 20kg
    - Regimen 1 and 3 contain stavudine (d4T) and are no longer used.
    - Regimen 7 – 11 are 2nd line regimens.
    - Regimen 12 is the standard 3rd line regimen.
- An “A” is added to the regimen number for adult formulations (e.g. Regimen 2A) and a “P” is added for pediatric formulations (e.g. Regimen 9P).

- Fixed dose combinations (FDC) are shown with a slash sign (e.g. TDF / 3TC / DTG).
- Combinations made up of separate tablets are shown with + sign (e.g. AZT/3TC + EFV).
- 3TC (lamivudine) is the backbone in ALL 1st and 2nd line regimens because it is extremely well tolerated and remains active even when drug-resistant HIV is present.

9.2.2 Pediatric / adult formulations

Most regimens are suitable for children and adults and are available as both adult and pediatric strength tablets, but TDF may affect growing bones and is not given to children under 2 years. The standard adult formulation (TDF 300mg) can be used from 30kg.

9.2.3 Start regimen

- Select one of 4 standard regimens to start patients on ART, based on age, weight and sex

Table 9: Selection of ART Regimen for Initiation

Age (years)	Weight (kg)	Sex	Conditions	Regimen
Under 3 year	-	-	No extra support	**(2P),9P,ABC/3TC/RAL**
			Extra treatment support required (pellets, granules)	**11P**
3 years or above	Under 20kg	-		**11P**
	20 - 29.9kg	-		**15P**
	30kg +	Male		**13A**
		Female	Provide contraceptive counselling	**13A**

- Start children under 3 years on regimen 11 if the site can ensure extra support with giving a more complex regimen to small children.
- Use alternative 1st line regimens if the patient has any contraindications for the standard regimen.

Contraindications

- Most contraindications are not absolute for a specific regimen: balance risks, benefits and alternatives. Usually, a suitable alternative regimen can be chosen from Table 10. The following conditions are absolute contraindications:
    - Patients who developed severe toxicity to any specific ARV (hepatitis or Stevens – Johnson syndrome form NVP or EFV, severe anemia from AZT, ABC hypersensitivity) should never be given a regiment containing the responsible ARV again.
    - Do not use TDF-containing regimens in severe renal failure (creatinine clearance <50 mL/min).

9.2.4 Adverse events / side effects

- Chose the appropriate alternative regimen from Alternative 1 for patients with:
    - Contraindications
    - Significant side-effects (immediately)
    - Troubling side effects that did not improve within 2 weeks with symptomatic treatment.
- Use Alt. 2 if Alt. 1 can't be used due to previous toxicity or other specific contraindications.
- The appropriate 2nd line regimen depends on the 1st line regimen the patient was on when confirmed with treatment failure.

9.2.5 Dosing and frequency

- See Table 11 for the number of tablets to be taken by children and adults once or twice per day.
- Most pediatric formulations are **tablets** that can be crushed if necessary. The only exceptions are:
    - LPV/r and ATV/r tablets must be **given whole** (not split or crushed).
    - LPV/r for children **under 6kg** requires **liquid suspension** (80/20mg per ml), granules or **oral pellets** (40/10mg per capsule).

9.2.6 Use of Regimen 11 as *start regimen* for children under 3 years

- Children under 3 years often have a high viral load and may be infected with drug-resistant HIV from previous exposure to ARVs (mother's ART and/or infant nevirapine prophylaxis).
- Therefore, Children **under 3 years** respond better when **started immediately** regimen **11**.
- Starting children on Regimen **11** requires more differentiated follow-up and mothers need more hands-on support to ensure proper swallowing and adherence to dosing:
    - Regimen **11** has a higher pill burden for children.
    - Choose the right formulation: Children **under 6kg** need LPV/r **liquid** (needs fridge, has bad taste) or **oral pellets** (heat stable, taste masked). Move from LPV/r pellets to pediatric tablets as soon as the child is able to swallow whole tabs. LPV/r tablets must be swallowed whole and cannot be broken, crushed or dissolved.
    - Demonstrate how to give ARVs (see below how to give pellets) and CPT.
    - Observe regularly how the mother gives the meds. Ensure the full dose is properly swallowed.
    - Monitor **VL** at **6** and **12** months and every **12** months thereafter.
    - Don't delay ART initiation if regimen 11 is not immediately available / feasible. Start on regimen 2 instead and move to regimen 11 when possible.
- How to give **LPV/r oral pellets**:
    - Oral pellets are inside capsules. Never give the actual capsule to swallow.

- Take out the required number of capsules and immediately close the bottle.
- Hold the capsule on both ends and twist in opposite directions while pulling apart.
- Empty pellets onto a clean spoon / into a feeding cup with expressed breastmilk. Immediately give to the infant. For children over 6 months: mix with age-appropriate food to mask the taste.
- Make sure the infant does not aspirate the pellets (coughing, choking, gagging).
- **Do not allow the pellets to dissolve / crush / stir the pellets** as this will release the unpleasant taste and reduce absorption.
- Throw away the empty capsule.
- N/B The Lopinavir Pellets are being replaced with Lopinavir granules.

Table 10: Standard ART Regimens (all strengths in mg)

Regi-men	Paed. Formulation	Adult Formulation	Used for ART initiation 'Start regimen'	Line	Prescriber level	Starter pack	'Tail' needed	Contraindications	Possible adverse reaction	If confirmed, use Alt 1	If confirmed, use Alt 2
0	**ABC** 60 / **3TC** 30 + **NVP** 50	**ABC** 600 / **3TC** 300 + **NVP** 200	**No**	1st	1	Yes	Yes	• ABC hypersensitivity • Jaundice / hepatitis	• Fever, body pains, vomiting, cough[4]	2	6, 5, NS
									• Hepatitis, rash	ABC/3TC+EFV	5, 4
									• Treatment failure	7	8
2	**AZT** 60 / **3TC** 30 / **NVP** 50	**AZT** 300 / **3TC** 150 / **NVP** 200	• Standard for children and adults under 30kg	1st	1	Yes	Yes	• Anemia <8g/dl • Jaundice / hepatitis	• Anemia, vomiting, appetite loss	0 or 5	6
									• Hepatitis, rash	4	5
									• Lipodystrophy Lactic acidosis	5	6, NS
									• Treatment failure	7	9
4	**AZT** 60 / **3TC** 30 + **EFV** 200	**AZT** 300 / **3TC** 150 + **EFV** 600	**No**	1st	1	No	Yes	• Anemia <8g/dl • History of psychosis	• Anemia, vomiting, appetite loss	5, 0	6
									• Lipodystrophy, lactic acidosis	5	
									• Hepatitis, rash[5], psychosis, gynecomastia[6]	2, 0	6
									• Treatment failure	7	9
5		**TDF** 300 / **3TC** 300 / **EFV** 600	• Standard for PLHIV who don't tolerate TLD	1st	1	No	Yes	• History of psychosis • Uncontrolled BP↑/ diabetes, renal failure	• Renal failure	0[7]	2 [8,14]
									• Hepatitis, rash[4], psychosis, gynaecomastia[5]	6	0, 2 [14]
									• Persistent dizziness, visual disturbances	6	0, 2 [14]
									• Treatment failure	8 [14]	9, NS [14]
6		**TDF** 300 / **3TC** 300 + **NVP** 200	**No**	1st	1	Yes	Yes	• Jaundice/Hepatitis • Uncontrolled BP↑/ diabetes, renal failure • Child under 3 years	• Renal failure	0[6,14]	2[7,14]
									• Hepatitis, rash	5	NS
									• Treatment failure	8 [14]	9[14], NS

[4] Fever, body pains, vomiting, cough/sore throat and breathing problems can be due to life-threatening ABC hypersensitivity (rare). Stop all ARVs immediately. Never re-start ABC.

[5] Mild skin rash and/or dizziness and nightmares are common after starting EFV. This usually resolves by itself and is not usually a reason to interrupt or change regimen.

[6] EFV can cause breast enlargement in children and men (one side or both sides). This may resolve spontaneously while continuing EFV, but NVP substitution is usually needed (and effective).

[7] Patients with CrCl <50 ml/min need lower dose 3TC but full dose ABC. Combine ABC/3TC peds tabs and ABC (single) tabs for correct dose ratio. Write or call NACP logistics hotline for special order of ABC (single) tabs (see section 21 for supply chain management).

[8] AZT dose needs to be reduced from CrCl <15.

Regi-men	Paed. Formulation	Adult Formulation	Used for ART initiation 'Start regimen'	Line	Prescriber level	Starter pack	'Tail' needed	Contraindications	Possible adverse reaction	If confirmed, use Alt 1	If confirmed, use Alt 2
7		**TDF** 300 / **3TC** 300 + **ATV/r** 300/100	**No**	**2nd**	**2**	**No**	**No**	• Uncontrolled BP↑/ diabetes, renal failure • Patient on rifampicin[9] • Pre-existing jaundice or suspected hepatitis[10]	• Renal failure	**8** [6,14]	**NS**
									• Jaundice [11]	**10**	
									• Treatment failure [12]	**12**	
8		**AZT** 300 / **3TC** 150 + **ATV/r** 300/100	**No**	**2nd**	**2**	**No**	**No**	• Anemia <8g/dl • Patient on rifampicin [8] • Pre-existing jaundice or suspected hepatitis [9]	• Anemia, vomiting, appetite loss	**7**	**9**
									• Lipodystrophy, Lactic acidosis	**7**	
									• Jaundice [10]	**11**	
									• Treatment failure [11]	**12**	
9	**ABC** 60 / **3TC** 30 + **LPV/r** 100/25 Or LPV/r 40/10)	**ABC** 600 / **3TC** 300 + **LPV/r** 200/50	**No**	**2nd**	**2**	**No**	**No**	• ABC hypersensitivity	• Fever, body pains, vomiting, cough [3]	**11**	**10**
									• Diarrhea, vomiting, dizziness, headache		
									• Treatment failure **[11]**	**12**	
10		**TDF** 300 / **3TC** 300 + **LPV/r** 200/50	**No**	**2nd**	**2**	**No**	**No**	• Uncontrolled BP↑/ diabetes, renal failure	• Renal failure	**11** [6,13]	**8** [6, 14]
									• Diarrhea, vomiting, dizziness, headache	**7**	**8** [14]
									• Treatment failure [11]	**12**	
11	**AZT** 60 / **3TC** 30 + **LPV/r** 100/25 Or LPV/r 40/10	**AZT** 300 / **3TC** 150 + **LPV/r** 200/50	• Preferred start regimen for children under 3 years at sites with extra support (pellets & granules- LPV/r 40/10)	**2nd**	**2**	**No**	**No**	• Anemia <8g/dl	• Anemia, vomiting, appetite loss	**10**	**7**
									• Lipodystrophy, lactic acidosis	**10**	**7**
									• Diarrhea, vomiting, dizziness, headache	**8**	**7**
									• Treatment failure [11]	**12**	

[9] Do not combine ATV/r with rifampicin (TB treatmet). See section 12 on for recommended ART regimen while on TB treatment.

[10] Do not start patients on pre-existing jaundice or suspected hepatitis on ATV/r. Use LPV/r instead.

[11] ATV/r can cause jaundice. Mostly, this is only of cosmetic concern. Refer jaundice to a specialist for LFT. If only indirect bilirubin is raised, continue ATV. Stop ATV/r if LFT cannot be done.

[12] Treatment failure on 2nd line ART and DTG-based regimens need confirmation of resistance mutations by genotyping before switch can be considered.

[13] DTG is very well tolerated. Mild headache, insomnia, nausea and diarrhea usually subside without regimen change.

Regi-men	Paed. Formulation	Adult Formulation	Used for ART initiation 'Start regimen'	Line	Prescriber level	Starter pack	'Tail' needed	Contraindications	Possible adverse reaction	If confirmed, use Alt 1	Alt 2
12	**ABC** 120 / **3TC** 60 **+ DTG** 50	**DRV** 600 **+ r** 100 **+ DTG** 50 (± NRTIs)	No	3rd	2	No	No		• Diarrhea, vomiting, headache, dizziness	NS	
									• Neuropathy	NS	
									• Rash, jaundice	NS	
13		**TDF** 300 / **3TC** 300 / **DTG** 50	• New standard for all women above 25kg	1st	1	No	No	• Renal failure • Uncontrolled BP↑, uncontrolled diabetes • (Hepatitis B or C) [13]	• Renal failure	15	
									• Insomnia, headache, nausea, diarrhea[14]	5	
									• Hepatitis[14]	5	6 [15]
									• Treatment failure [11]	(8)	(11)
14		**AZT** 300 / **3TC** 300 **+ DTG** 50	No	1st	1	No	No	• Anemia <8g/dl • (Hepatitis B or C) [13]	• Anemia, vomiting, appetite loss	13	5
									• Insomnia, headache, nausea, diarrhea [12]	4	
									• Hepatitis [13]	4	
									• Treatment failure [11]	(7)	(10)
15	**ABC** 120 / **3TC** 60 **+ DTG** 50	**ABC** 600 / **3TC** 300 **+ DTG** 50	No	1st	1	No	No	• ABC hypersensitivity • (Hepatitis B or C) [13]	• Fever, body pains, vomiting, cough [3]	13	5
									• Insomnia, headache, nausea, diarrhea [12]	ABC/3TC + EFV	4, 0
									• Treatment failure [11]	(7)	(10)

[14] DTG may worsen liver damage in patients with viral hepatitis (B or C). Check transaminases before and after starting DTG in patients with known Hep B or Hep C.

[15] Do Hep B test before taking patient off TDF-based regimen to avoid flare-up of undiagnosed Hep B. Add entecavir to ART regimen that does not contain TDF to control Hep B.

Table 11: Standard Pack Sizes and Dosing of Pediatric and Adult Formulations of ARVs, IPT and CPT

Drug	Tablets per tin		3 – 3.9 kg		4 – 5.9 kg		6 – 9.9 kg		10 – 13.9 kg		14 – 19.9kg		20 – 24.9kg		25 – 29.9kg		30 – 34.9 kg		35 – 39.9 kg		40 kg +	
	Paed.	Adult	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
NVP	60	60	1	1	1	1	1 ½	1 ½	2	2	2 ½	2 ½	3	3	1	1	1	1	1	1	1	1
AZT / 3TC	60	60	1	1	1	1	1 ½	1 ½	2	2	2 ½	2 ½	3	3	1	1	1	1	1	1	1	1
AZT / 3TC / NVP	60	60	1	1	1	1	1 ½	1 ½	2	2	2 ½	2 ½	3	3	1	1	1	1	1	1	1	1
ABC / 3TC	60	60	1	1	1	1	1 ½	1 ½	2	2	2 ½	2 ½	3	3	1	0	1	0	1	0	1	0
LPV / r liquid / tabs	60	120	*1ml*	*1ml*	*1.5ml*	*1.5ml*	2	1	2	1	2	2	2	2	3	3	3	3	2	2	2	2
LPV / r pellets (in caps)	120		2	2	2	2	3	3	4	4	5	5	6	6								
EFV	90	30							0	1	0	1 ½	0	1 ½	0	2	0	2	0	1	0	1
ATV / r		30															0	1	0	1	0	1
TDF / 3TC		30															0	1	0	1	0	1
TDF / 3TC / EFV		30																	0	1	0	1
TDF / 3TC / DTG		30															1	0	1	0	1	0
DTG		30															0	1	0	1	0	1
DRV		60																	1	1	1	1
r		60																	1	1	1	1
ETV		120																	2	2	2	2
RAL		60																	1	1	1	1
CTX 120	1000		0	1	0	1	1	1	1	1	2	2	2	2								
INH 100	100		0	½	0	½	0	1	0	1½	0	2	0	2½								
CTX 480		1000					0	½	0	½	0	1	0	1	0	2	0	2	0	2	0	2
CTX 960		1000									0	½	0	½	0	1	0	1	0	1	0	1
INH 300		672									0	½	0	½	0	1	0	1	0	1	0	1

9.3 Choosing regimen and time of starting in special situations

Table 12: Choosing ART Regimen and Timing of Initiation in Special Situations

Condition	Timing of ART initiation	Weight	
		Less than 20kg	20kg +
Anemia (<8g/dl)	• As soon as possible	**15P**	**13A, 15P**
Active TB	• Within 14 days of diagnosis • TBT + ART can be started on the same day if the patient is stable. Don't delay TBT or ART	**Under 3 yrs: 9p/11P** **3 yrs +: 4P / 4A**	**13A**[16]
Jaundice	• Refer to next level of care • After investigation and stabilization	**4P / 15P**	**5A / 13A**[17]
Pregnancy	• As soon as possible		**13A**[18]
In labor (new HIV+)	• As soon as possible		**13A**
Renal failure	• Refer to Hospital for a medical doctor review • Start within 7 days of diagnosis	**0P / 0A**	**0P / 0A**
Psychiatric Illness (history)	• As soon as possible • Reliable guardian needed	**9P / 11P**	**13A / 6A**

9.4 Non-standard (NS) ART regimens

- Only expert ART clinicians can initiate NS regimens with reference from the national program.
- Patients with multiple contraindications and/or adverse reactions against all standard NRTIs (TDF, AZT, ABC) or NNRTIs (NVP, EFV) may need a NS regimen.
- Consider ATV/r or LPV/r for substitution of DTG, NVP and EFV.

[16] Give 1 tablet of TDF/3TC/DTG (13A) in the morning and 1 tablet of DTG in the evening. This is needed to double the daily dose of DTG while on rifampicin-containing TB treatment. Continue with only 1 tablet of 13A in the morning after rifampicin is stopped.

[17] Regimen 13A can only be used if severe liver damage (ascites; albumin <2.8g/dL; total bilirubin >50mmol/L; encephalopathy) and/or viral hepatitis B or C have been ruled out.

[18] DTG is best started later in pregnancy after the risk period for neural tube defect, which is early in pregnancy (usually within the first twelve weeks of conception).

10 Prescribing and dispensing ARVs

NACP: Important Points to Note

- ARVs should be taken after the same number of hours every day (e.g. every 12 or every 24 hours). Most ART regimens can be taken in the morning, at noon or at night and it does not matter if they are taken before, after or with food.
    - DTG (regimen 13, 14 and 15) can disturb sleep and should therefore be taken in the morning.
    - EFV (regimen 4 and 5) can cause dizziness, especially in the first 4 weeks. This is less troublesome when taken before bed.
- Missing a dose: what to do if a patient remembers to take his ARVs late? If the patient remembers:
    - Less than half-way to the next scheduled dose: take the missed dose immediately, and take the regular next dose at the normal time.
    - More than half way to the next scheduled dose: skip the missed dose and take the regular next dose at the normal time.
- Dispense ARVs only in the original sealed container. Only exception: open containers to dispense the precise number of tablets needed for Starter Packs. 1
- Only the patient or his registered guardian/treatment supporter is allowed to collect ARVs.
- With the use of their ART passports, patients are allowed to collect ARVs from any ART clinic in Liberia following special rules (see below).

10.1 Rules for prescribing and dispensing of ARVs

ARVs for treatment of HIV (ART)

- Only NACP-approved and trained clinical ART providers are authorized to **prescribe** ART:
- Only health workers and qualified pharmacy personnel are allowed to **dispense** ARVs.
- Only the patient or his individual registered guardian/treatment supporter should be allowed to collect ARVs.

ARVs for Post-Exposure Prophylaxis (PEP)

- PEP needs to be started as soon as possible after high-risk exposure, e.g. rape, accidents.

Emergency dispensing to patients from another PMTCT/ART site

- In an emergency, patients are allowed to collect ARVs from any ART clinic in Liberia under the following conditions:
    - The patient must present an ART passport card with ARV dispensing information.
    - If in doubt about a patient's authenticity, confirm by calling the site where the patient is registered.
    - Document emergency ARV dispensing in the patient's clinic card.
    - ARV dispensed to patients registered at another site must be recorded- improvise a hardcover register: Date, Patient unique identification code, original facility name, patient name and contact details, ARV name and quantity dispensed, reason for emergency dispensation, staff name.
    - Instruct patient to return to their ART clinic of registration as soon as possible to ensure the patient is not recorded as defaulter.
    - In the event of continuous emergency dispensing to a patient, clinicians should make all efforts to communicate with the patient's original facility to facilitate information sharing on patients status – whether transferred.

10.2 Determining quantities to be dispensed and next appointment

- Table 11 shows the number of tablets to be supplied for appointment intervals of 2, 4, 8 or 12 weeks for the total number of tablets taken of each ARV per day (pediatric and adult formulations).
- The *Actual number of tablets needed* is the minimum number of total tablets the patient needs to take home to cover the time to the next appointment. (Total tablets = tablets remaining from the previous visit **+** tablets newly dispensed). The number needed includes an extra 2-day supply to act as a safety-buffer. The total tablets must meet or exceed the *Actual number of tablets needed*.
- Different ARVs come in tins of 30, 60, 90 or 120 tablets (see Table 11). Given that only full tins should be dispensed, the number of tablets needed is *rounded up* to multiples of full tins.
- *Rounding up* may result in a considerable *over-supply.* For some regimens and dosages, perfectly adherent patients will be left with more than half a tin of ARVs at their next appointment. Explain this to the patient / guardian and emphasize the importance of keeping the next appointment.
- The number of tablets expected to be used in the interval is shown for 'perfect adherence' (100%) and for 'good adherence' (95%-105%).
- Calculate the number of tablets used by subtracting total tablets remaining at the current visit from total tablets available at the end of the previous visit.

10.3 Appointment / dispensing interval

- Give next appointment date at least 2 days before ARVs would be finished to allow for the safety buffer.
- Take account of the weekly ART clinic schedule (e.g. Mondays + Wednesdays) when giving the next appointment. Appointments may be given for 2 weeks (starter pack), 4, 8 or 12 weeks.
- Patients initiating standard or alternative first line ART have to be reviewed clinically after **2 weeks** if they have been given a starter pack for one month / otherwise after **1 month** and then **every month for the first 6 months**.
- Thereafter, stable, virally suppressed and adherent patients can be given up to 12-week (**3-month**) appointments.
- In exceptional cases (e.g. international travel), up to **6** or even **12 months** of ARVs can be dispensed.
- Patients starting 2nd line ART have to be seen every 4 weeks for the first 6 months. Thereafter, patients who are stable and adherent to 2nd line ART can be given up to 8-week appointments.
- Clinicians should ensure alignment of CPT and IPT dispensing with ART visits. Care should be taken to ensure alignment of ART visits with other care services visit for clients – EPI, ANC, SRH
- Push back appointment date to allow patients to use up accumulated 'hanging' tablets, e.g. give an appointment after 5 instead of 4 weeks.

11 Starting ART

NACP: Important Points to Note

- ART does not cure HIV infection, but allows the immune system to recover.
- Once started, ART must be taken every day for life. All patients need effective support:
    - Identify a reliable guardian / treatment supporter who needs to attend ART education.
    - Link with patient / peer support group
- Successful ART leads to very low levels of virus in blood, semen and vaginal fluids. This greatly reduces the risk of sexual or mother-to-child transmission. However, condom use is important.
    - In the first 6 months after starting ART
    - Later if adherence is not good and/or viral suppression has not been confirmed.
- All patients need a validated HIV test according to Liberia HTS Guidelines before starting ART.
- Patients who are late for their ART appointment will be actively followed from the clinic (home visit, phone, guardian).

11.1 Record keeping

- PMTCT/ART nurse or clinician: fill ART patient cards immediately prior to starting ART
- Dispensed ARVs must be recorded on the patient ART treatment card.

11.2 Confirming HIV infection

- All patients need a validated HIV antibody test according to the Liberia national HTS guidelines to rule out situation of a wrong result allocation to a client or fraudulent access to ART, Before starting ART

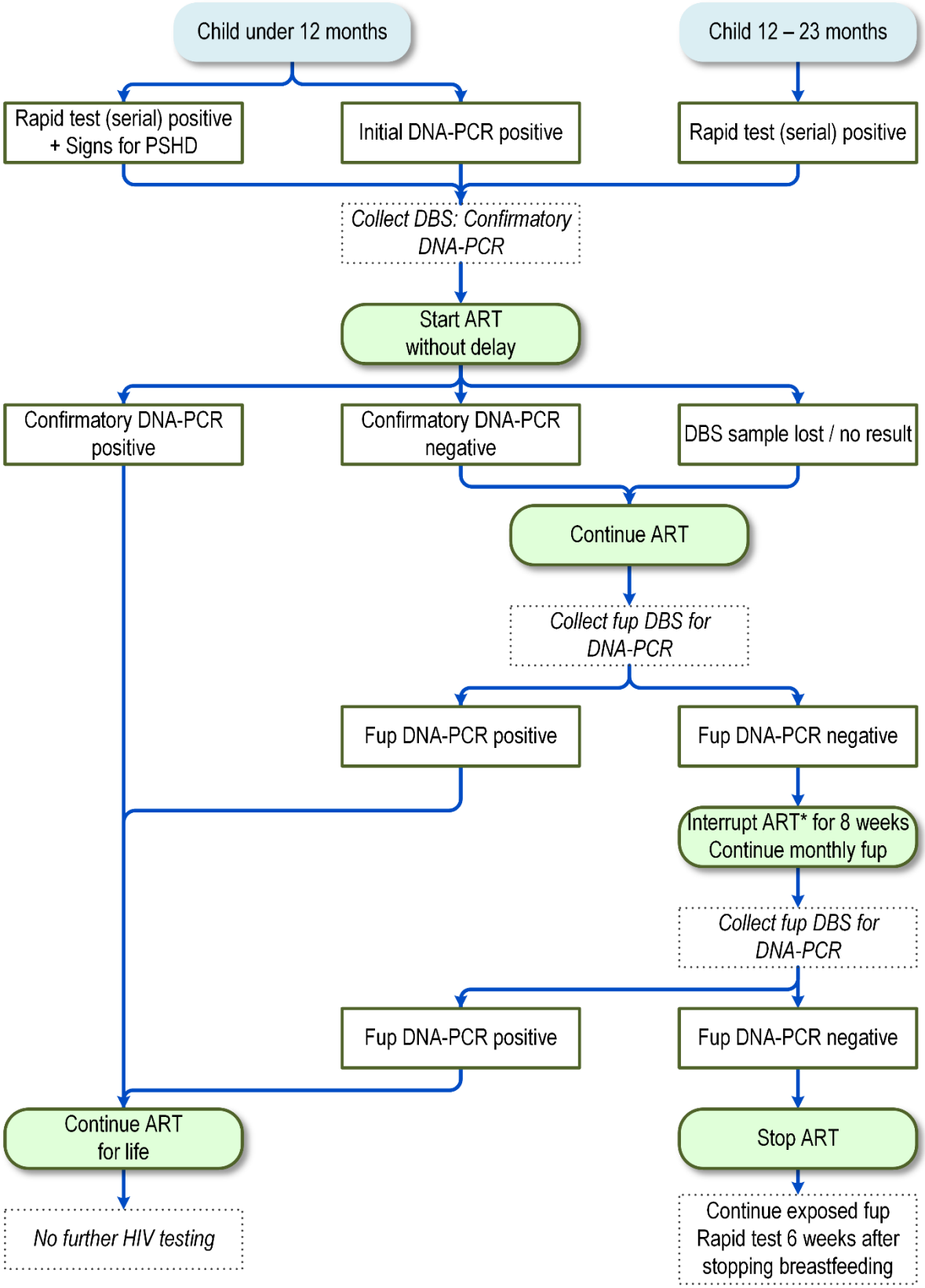
11.2.1 Validated testing for adults and children 2 years and above

- Ensure that all Quality Assurance protocols for HIV testing are being followed. Refer to the Liberia revised HTS guideline- 2020 for details of the testing protocols.

11.2.2 Confirmatory HIV testing for children under 2 years

- All children to be started on ART under the age of 2 years need a confirmatory DNA-PCR.
- Collect the DBS sample on / before the day of initiation.
- Don’t delay ART initiation - don’t wait for the confirmatory PCR result before starting ART.
- Review Figure 2 for the schedule of follow-up testing and the correct action based on the results.

Figure 2: Confirmatory HIV testing for Children under 2 years



11.3 Preparing the patient for ART

- Start ART as soon as possible after testing HIV positive (Liberia endorses the WHO test and treat policy).
- Offer HIV positive pregnant women the option to start ART on the same day of diagnosis.
- Confirm that patient (or parent/guardian if patient is <15 years) understands implications of ART and is committed to lifelong adherence.
- Identify long-term treatment support for patients who are unable to take responsibility for their own treatment (persons with mental disability or drug-addiction, etc.).
- Invite all patients to attend the initial group counselling and/or the ART initiation visit with a named guardian/treatment supporter.
- Another patient can be appointed as the *named treatment supporter* if the patient is unable to identify a suitable guardian.

11.3.1 Patient education when starting ART

NACP: Important Points to Note

- A small number of patients on ART develop significant side-effects.
- Most side-effects are mild and disappear while ART is continued.
    - DTG can **disturb sleep**, but this is very rare when taken in the morning and usually settles by itself.
    - EFV can cause **bad dreams** and **dizziness** in the first few weeks of treatment, but this usually disappears by itself and it is important to continue treatment.
- Some side-effects require a regimen change.
    - Ask all men/boys on an EFV-containing regimen to monitor themselves for **swelling of the breast** (gynecomastia). Report this at the next scheduled visit. Substitute EFV with DTG as soon as possible after onset of gynecomastia to improve likelihood of full reversal.
- Very few patients develop serious side effects. Stop all drugs immediately and present to the hospital if any of the following conditions are seen:
    - Yellow eyes / hepatitis
    - Severe stomach pain and vomiting
    - Severe **skin rash** with blisters, involving eyes, mouth or genitals

- All patients must receive individual counselling at ART initiation.
- Women starting ART in labor can receive individual ART counselling after delivery.

Individual ART counselling

- Confirm that patient and guardian have understood the following:
    - Commitment to lifelong adherence
    - Dosage and interval of taking ARVs
    - Potential side-effects
    - Date of next appointment

11.4 Screening and treating hypertension among PLHIVs (HIV/CVD) Integration

- HIV in adults is commonly associated with high blood pressure, a possible trigger for stroke
- Even without hypertension, HIV patients have a higher risk of stroke.
- Treating all hypertensive ART patients can prevent many cases of stroke, heart and kidney failure and other complications.
- Screen all adults (**30 years +**) for hypertension:
    - At least once at the time of ART initiation. Record BP on patient card header.
    - Aim to repeat BP screening at least every 12 months.

11.4.1 Correct BP measurement method

- Make sure the patient is relaxed (rest at least 5 minutes after physical activity).
- Sit upright, remove clothing from upper arm that may restrict blood flow or interfere with BP cuff.
- Make sure BP cuff is the right size: check the arm circumference is within range shown on the cuff.
- If the initial reading is higher than **140** systolic and/or **90** diastolic:
    - Repeat reading twice. Wait for at least 5 minutes between readings.
    - Calculate the average between the 3 readings (separately for the systolic and diastolic values).

Table 13: BP Diagnosis In PLHIV

Classification	Systolic		Diastolic	Management
Mild	140-159	*and/or*	90-99	Try *lifestyle measures* alone, start stepped treatment if no normalization
Moderate	160-179	*and/or*	100-109	*Lifestyle measures* + stepped treatment
Severe	>180	*and/or*	>110	Urgent treatment *Lifestyle measures* + stepped treatment

11.4.2 Management of hypertension

- Start management for hypertension if the average of the 3 readings is higher than **140** systolic and/or **90** diastolic (refer appropriate clinical guidelines in Liberia)**.**
- Urgent treatment for severe hypertension if repeat reading is **180** systolic and/or **110** diastolic.
- *Lifestyle measures*: Eat more vegetable and fruit, less meat / fat, reduce salt, stop smoking, exercise regularly, normalize weight, limit alcohol.

11.5 Baseline and routine laboratory investigations

- Do routine urine LAM and serum CrAg for patients with advanced HIV infection (section 6.1).
- The national program does not require:
    - Routine baseline laboratory investigations before starting ART or routine investigations for ART toxicity.
    - Routine scheduled CD4 monitoring of patients on ART is not necessary.
- Use targeted investigations if clinically indicated.
- Liberia runs a scheduled VL monitoring for all recipients of care; 6-months after treatment initiation and 12-monthy afterwards (except in targeted situations)

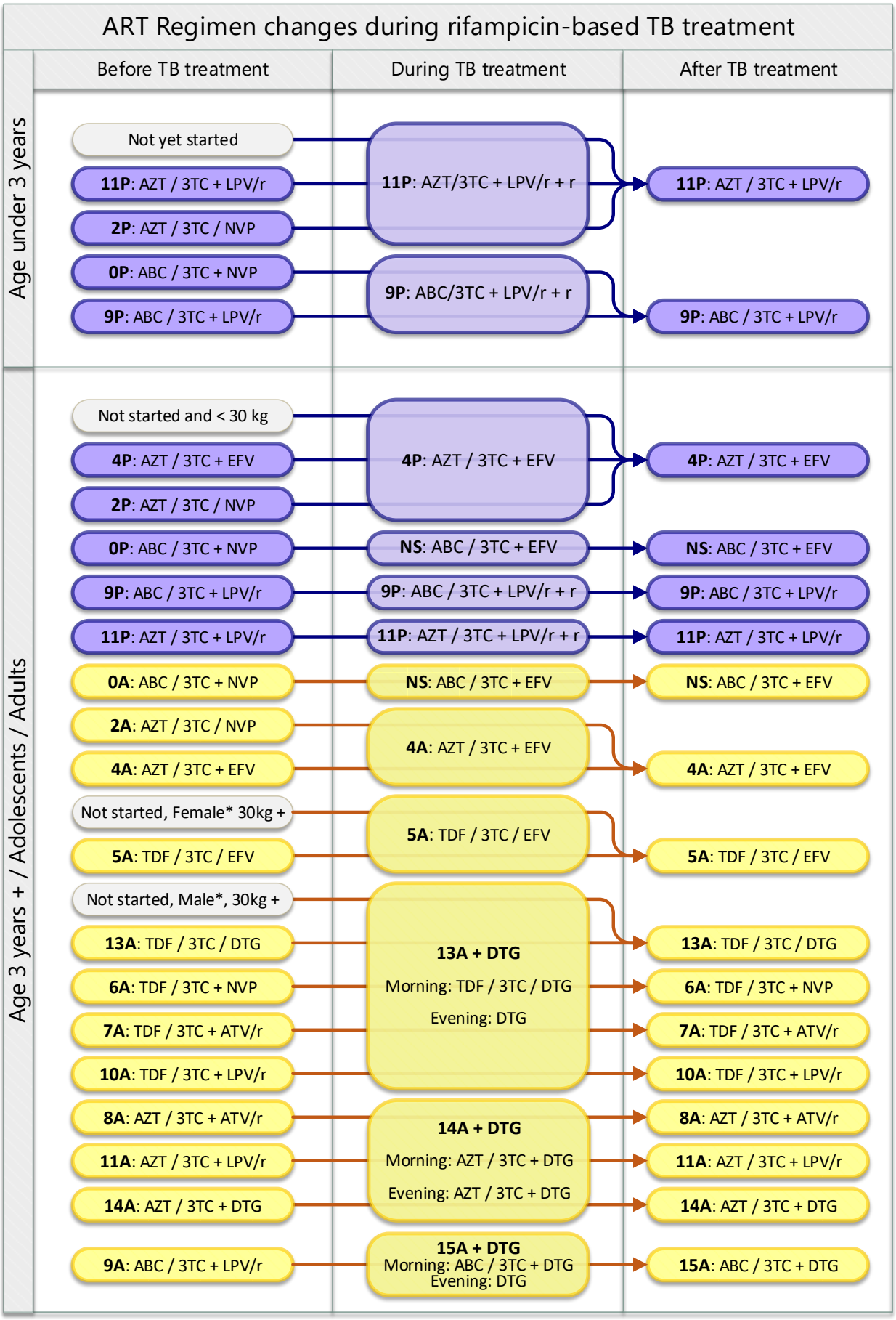
12 Combining ART and TB Treatment

NACP: Important Points to Note

- Every PLHIV is at 10% annual, and 50% life time risk of acquiring TB.
- TB is the commonest cause of sickness and death among PLHIV.
- The risk of active TB is high for the first 6 months on ART and remains elevated for life.
- Most HIV patients with TB do not have typical TB symptoms (productive cough). Many are sputum smear negative.
- HIV infected TB patients must start ART and TB treatment as soon as possible. The long term outcome is poor if only one treatment is taken.

- NVP, ATV/r, LPV/r and DRV have significant interactions with rifampicin. Do not combine if possible.
- Use Figure 3 below to select the right ART regimen to give during rifampicin-based TB treatment. Use alternative regimens for patients with specific contraindications.
- DTG-based ART regimens are a good combination with TB 1st line treatment.
    - Double the dose of DTG while on rifampicin-containing TB treatment: take the regular DTG-containing regimen in the morning and one additional tablet of DTG 50mg in the evening (after 12 hours).
    - Continue with double-dose DTG for 7 days after the last dose of rifampicin.
    - However, DTG-based regimens are the best option for patients previously on 6A, 7A, 10A and 11A who need TB treatment.
- Patients with ART failure (see section on ART failure) may develop active TB. In this case, 2nd line ART needs to be combined with TB treatment.
    - **Preferred:** Use **13A, 14A** or **15A** (with double dose DTG) while on TB treatment. Move back to previous ART regimen after TB treatment is completed.
    - **Alternative:** Use LPV/r-based 2nd line regimens (**9A**, **10A**, **11A**) for patients who cannot use **13A, 14A or 15A**.
        - Double the daily dose of LPV/r (4 tablets of LPV 200mg / r 50mg every 12 hours) for the duration of rifampicin treatment.
        - Patients previously on ATV/r-based regimens (**7A**, **8A**) move back to ATV/r once TB treatment has been completed.
    - Alternatively, replace rifampicin with rifabutin in patients on LPV/r (normal dose). Give rifabutin 150mg daily. Other TB drugs in the regimen should also be continued.

Figure 3: ART Regimen Changes During TB Treatment for Children and Adults



- Table 14 shows relevant interactions.
    - **Green:** Combination causes no problems
    - **Yellow:** Combination causes usually no problems but monitor patient for possibly increased side-effects or adjust dosage as shown
    - **Red:** Do not combine without specialist advice

Table 14: Relevant Interactions Between ARVs and TB Drugs

	Isoniazid	Rifampicin	Rifapentine	Streptomycin	Ethambutol	Pyrazinamide
TDF	OK	OK	OK	renal toxicity	OK	OK
AZT	OK	OK	OK	OK	OK	OK
3TC	OK	OK	OK	OK	OK	OK
DTG	OK	OK double DTG dose	poss. hypersensitivity (don't combine)	OK	OK	OK
EFV	OK	OK	no experience needs EFV ↑	skin rash	OK	hepatitis
NVP	skin rash	start NVP full dose, hepatitis	no experience needs NVP↑	skin rash	OK	hepatitis
ABC	OK	OK	OK	OK	OK	OK
ATV/r	OK	no experience (don't combine)	no experience (don't combine)	OK	OK	OK
LPV/r	OK	major dose adjustment	no experience (don't combine)	OK	OK	OK

13 Things to Check during ART Appointments

13.1 Confirm Appointment

- On the patient treatment card, health passport and appointment diary, look at the next Appointment Date given at the previous visit to confirm that the patient is not late.
- The patient is likely to have missed doses if s/he is more than 2 days late. Compare and validate with **Pill Count** and the reported number of **Doses Missed.**

13.2 Monitoring height and weight changes

- Record current weight (and height for children under 18 years).
- Look for weight changes compared with previous measurements. Patients are expected to normalize their weight in the first 6-12 months on ART.
- Classify nutrition status for children based on *IMAM* guidelines using the MUAC. MUAC less than 110mm (11.0cm) indicates Severe Acute Malnutrition (SAM), and needs immediate treatment. MUAC of between 125mm (12.5cm) and 135mm (13.5cm), YELLOW COLOUR, indicates that the child is at risk for acute malnutrition and should be counselled and followed-up for Growth Promotion and Monitoring (GPM). MUAC over 135mm (13.5cm), GREEN COLOUR, indicates that the child is well nourished.
- Investigate any consistent weight loss over 2 or more consecutive visits. (Be sure the scale is correctly calibrated).

13.3 Screen for HIV-related diseases and drug side-effects

- Use the standard clinical monitoring checklist for HIV patients to actively screen for symptoms of HIV-related diseases and/or drug side effects.
- Use the syndromic guide shown in Table 15 to identify the likely cause of symptoms and to choose the right primary and secondary management.
- A symptom that could be caused by an HIV-related disease or by a side-effect is more likely a side-effect if it started or worsened after the start of medication.
- Circle side-effects Yes / No on the patient card and specify new side effects under *Notes*.
- Change the ART regimen if medically indicated (see below).
- Write any new HIV-related disease under *Notes* on the back of the patient card.

13.4 Indications for interrupting or stopping ART

- Stop ART in patients with repeated history of poor adherence. Consider stopping if intensive counselling has failed.
- ART should be stopped abruptly and completely if any of the following severe side-effects are suspected:
    - Lactic acidosis
    - Pancreatitis
    - Severe hepatitis
    - Stevens-Johnson syndrome
- Stopping ART in patients with less severe toxicity against EFV or NVP (skin rash, psychiatric effects) should be done by giving a 'tail' of the other 2 ARVs for 7 days to prevent 'monotherapy' due to the long half-life of NVP and EFV (NNRTI tail).

13.5 Selecting regimen and formulation for continuation

- Don't change regimen without clear medical indication. Unnecessary changes decreases future treatment options.

Do NOT change ART regimen:

- If a patient has moderate dizziness / drowsiness / nightmares in the first 2-4 weeks of starting a regimen with EFV.

Change dosage and formulation:

- Review current weight for children and adjust dosing if necessary. Children on 1st line regimens change to adult formulation and dosage when their weight is over 30kg (see Table 10).
- Start a new *ART Patient Card – Adult ARV Formulations* for children who change from pediatric to adult ARV formulation. File together with the old card.

Change ART regimen:

- Use Table 10 to select the appropriate alternative regimen. Change patients with significant side-effects immediately. Change patients with troubling side-effects that did not improve after 2 months of symptomatic treatment.
- Children who were on pediatric 2nd line regimen (Regimen 9P) routinely change to standard adult 2nd line regimen (Regimen 7A) once they **weigh over 30kg**. This is to reduce the pill burden while continuing on an equally effective regimen.
- **Routinely change** adolescents who were on **2A** to **15A** once they **weigh over 20kg and 13A** when they weigh over **30kg.**

- Add any new regimen to the *ART Regimens* history section on the card header and specify any non-standard regimen here.
- Multiple contraindications / side-effects may require NS regimen (see section 9.4).

13.6 Achieving optimal adherence

- Patients must take more than 95% of doses at the prescribed interval for life to prevent HIV drug-resistance.
- Repeated skipping of individual doses or repeated longer interruptions inevitably lead to development of HIV drug-resistance.

13.6.1 Routine adherence support

- Ask at every clinical assessment visit:
    - What challenges have you had taking your ARVs?
    - What days / time of day are you most likely to forget taking your meds? (Weekends, weekdays, mornings, evenings?)
- Remind patients of the importance of perfect adherence at every clinic visit:
    - Initial ART counselling
    - Follow-up group counselling
- Start **intensive adherence counselling (IAC)** if any sign for poor adherence
- Give **practical strategies** how to achieve optimal adherence:
    - Build ARVs into the daily routine (e.g. before washing the face, after evening meal)
    - Ask family or friends to remind
    - Set a daily alarm on the cell phone
    - Keep a 'drug diary' and mark every tablet taken
- Encourage honest dialogue. Avoid giving the impression of 'policing' the patient. Work with patients to help them achieve good adherence.
- Poor adherence always has valid reasons and most can be resolved: vomiting, transport problems, domestic problems, (perceived) side effects, psychological problems, wrong understanding, etc.

13.6.2 Intensive Adherence Counselling

Indications

- Questionable or confirmed poor adherence noted at regular visit / late for appointment
- Routine VL result **above detection limit**, even if the results is <1000 copies/ml (suspected treatment failure).

Step-by-step guide for IAC

- Ask both patient and the treatment supporter to attend.
- Explain the information presented in the boxes with **NACP important points to note, under**:
    - Starting ART
    - Achieving optimal adherence
    - Monitoring for treatment failure / HIV drug resistance
- Work a bi-partisan commitment with the patient and the treatment supporter for good adherence going forward:
    - Encourage the patient to repeat the VL in 3 months, hopeful for an undetectable VL.
- Identify the specific problems / situations that get in the way of good adherence. Ask for:
    - Frequent travel / boarding school
    - Conflicts at home / lack of privacy / stigma
    - Alcohol / drug problems
    - Mood disorder / depression
- Agree on an action plan and write instructions in the patient card
- Consider giving monthly appointments until follow-up VL is due (after 3 months of good adherence).
    - Do pill count and assess adherence closely at each follow-up visit
    - Review action plan: what has worked – what has not? Revise plan if necessary.

13.7 Special treatment support for children and adolescents

- Good adherence is particularly challenging for children and adolescents:
    - Dependence on caregivers, often in difficult home environment.
    - Need to adjust ARV dose by body weight.
    - Developmental and psychosocial changes.
- Ask at every visit:
    - Who is responsible for supervising the taking of ARVs?
    - Who stands in for the guardian if s/he is away?
    - How do you give the tablets?
- Discuss selecting a trusted teacher or fellow student as treatment supporter for children attending boarding school. Offer to transfer the child to the most convenient ART site closest to school.

- Children (just like any other patients) who are adherent and stable on ART can be given 3 months of drug supply or more if necessary.
- Promote use of **Teen Clubs / Support Groups** for adolescent ART out of regular clinic days.

13.7.1 Managing the disclosure process

- Explain to the parent that disclosure is a gradual process. Assure the parent that you will work through this process together.
- Remind parents / care givers at every clinic visit that it is very important to talk to the child about their HIV infection and ART status.
- Don't isolate the child behind a "wall of secrecy and silence". The child probably knows more than you think, and children demonstrate better adherence when disclosure is at an earlier age.
- Never lie or make up stories about the child's HIV infection, as this could undermine trust and make the child feel guilt, shame and damage self-esteem, resulting into poor adherence.
- Ask parents at every visit how far they have come in the disclosure process.
- Encourage parents to talk directly to their child in the environment they feel most comfortable. Offer to take part in the discussion if parents are uncomfortable doing this on their own.

From age 5-7 years:

- Explain that the child has a germ that requires taking drugs every day to keep the germ 'asleep'.
- Full disclosure can begin as early as 8-10 years.

By age 11-13 years:

- Add more information gradually. By age 11-13 years the child should know that s/he has HIV. Also, all of the following should have been explained:
    - Touching, cuddling and kissing are safe.
    - Sharing soap, towel, plates and cutlery is safe.
    - Don't share needles or razor blades. HIV and other diseases can travel in traces of blood and infect the other person.

From puberty / adolescence:

- Invite open dialogue about 'teenage challenges' that can get in the way of good adherence:
    - Low self-esteem, pill fatigue, frustration about the need for ART
    - Conflicts at home / at school
    - Relationships
    - Alcohol / drug abuse

- Encourage to join an "*ART Teen Club*" where available. Provide extra support for patients transitioning from a *Teen Club* to the adult clinic.
- Address family planning needs with all adolescent girls at every visit
- Offer condoms; explain use on penis model; give at least 20 condoms
- Explain: Don't have penetrative sex without condom. HIV can travel in semen and vaginal fluid and infect the other person.
- Explain: It is still possible for you to have children when you want to. The risk of passing HIV to your partner or to your baby is very low if your VL is undetectable.
- Explain: Where to access STI treatment, family planning services and help in case of sexual assault.

13.8 Keeping track of months since ART initiation

- Needed to determine when blood samples for routine VL monitoring are to be drawn.
- Calculate and document on the ART patient card the number of months since the patient first started ART. Simply calculate the number of months since first ART initiation, ignoring any potential gaps (periods of stopping / defaulting).
- Electronic medical record systems give automatic reminders when scheduled VL samples are due.

13.9 Monitoring for treatment failure / HIV drug resistance

NACP: Important Points to Note

- ARV drug resistance starts gradually and the virus will still be partly suppressed for many months. Emerging drug-resistant virus does not cause any immediate clinical symptoms.
- HIV will grow resistant to more and more ARVs if a patient continues to take a failing ART regimen for several months. Accumulated multiple ARV resistance can make it difficult to find a second line regimen that still works.
- HIV drug resistance usually affects different ARVs of the same class.
- ***Example:*** HIV that has grown resistant to Raltegravir (RTG) will also be resistant to Dolutegravir (DTG), even if the patient has never taken DTG before.
- Drug resistant virus can be transmitted to other people.

13.9.1 Clinical screening and diagnosis of treatment failure

- **Suspect ART failure** if both of the following clinical conditions are met:
    - On ART for 12 months or more
    - New HIV-related disease / unexplained weight loss / failure to thrive
- For all **suspected ART failure** cases, look for indications for poor adherence in the last 6 months
    - Adherence was good:
        - Do a targeted VL or refer to have this done immediately.
    - Adherence was questionable:
        - Start intensive adherence counselling
        - Do a targeted VL after 3 months if adherence was satisfactory.
- See Figure 4 for the interpretation of VL results.

13.9.2 Viral load (VL) testing

NACP: Important Points to Note

- VL is the best measure for the level of progression of HIV infection.
- Successful ART leads to an **undetectable VL, which** is also called **viral suppression**. This is the **aim of ART**.
- VL testing uses an advanced lab method (DNA-PCR) on a blood sample. It can be done from:
    - Dried blood spot (DBS): Transport in plastic bag with desiccant at ambient temperature, sample viable for 3 months or more.
    - Blood plasma: Transport in cooler box to lab within 24 hours.
- VL is required to confirm suspected ART failure from clinical or CD4 measurements
- The VL schedule is designed to detect early ART failure; First after 6-months on ART, and every 12 months afterwards.
- Do additional targeted VLs outside of this schedule when suspecting ART failure.
- Explain the standard VL monitoring schedule to every patient. Ask the patient to help remember when VL is due.
- Actively communicate (phone / home visit) any detectable VL results (above detection limit, even if <1000) to patients as soon as the result is received at the site. Call for an early appointment.

When to do VL

- **Routine scheduled** VL is done for all patients at specific times after ART initiation:
    - At 6 months, and 12-monthly afterwards.
- **Targeted/Repeat**
    - Routine VL result was detectable and patient has received IAC and 3 months have elapsed since IAC was started.
    - Patient with clinically suspected treatment failure and we are confident adherence in the last 3 months was good.
    - Mandatory before starting 2nd line ART to confirm suspected ART failure.

Interpreting and acting on VL results

- Review Figure 4 for indication, interpretation and action from VL testing.

Successful ART

Finding	**Routine** or **targeted / repeat** VL below detection limit
Interpretation	Successful ART
Action	Praise the patient and encourage further good adherence. Continue on the same regimen. Monitor VL at next milestone.

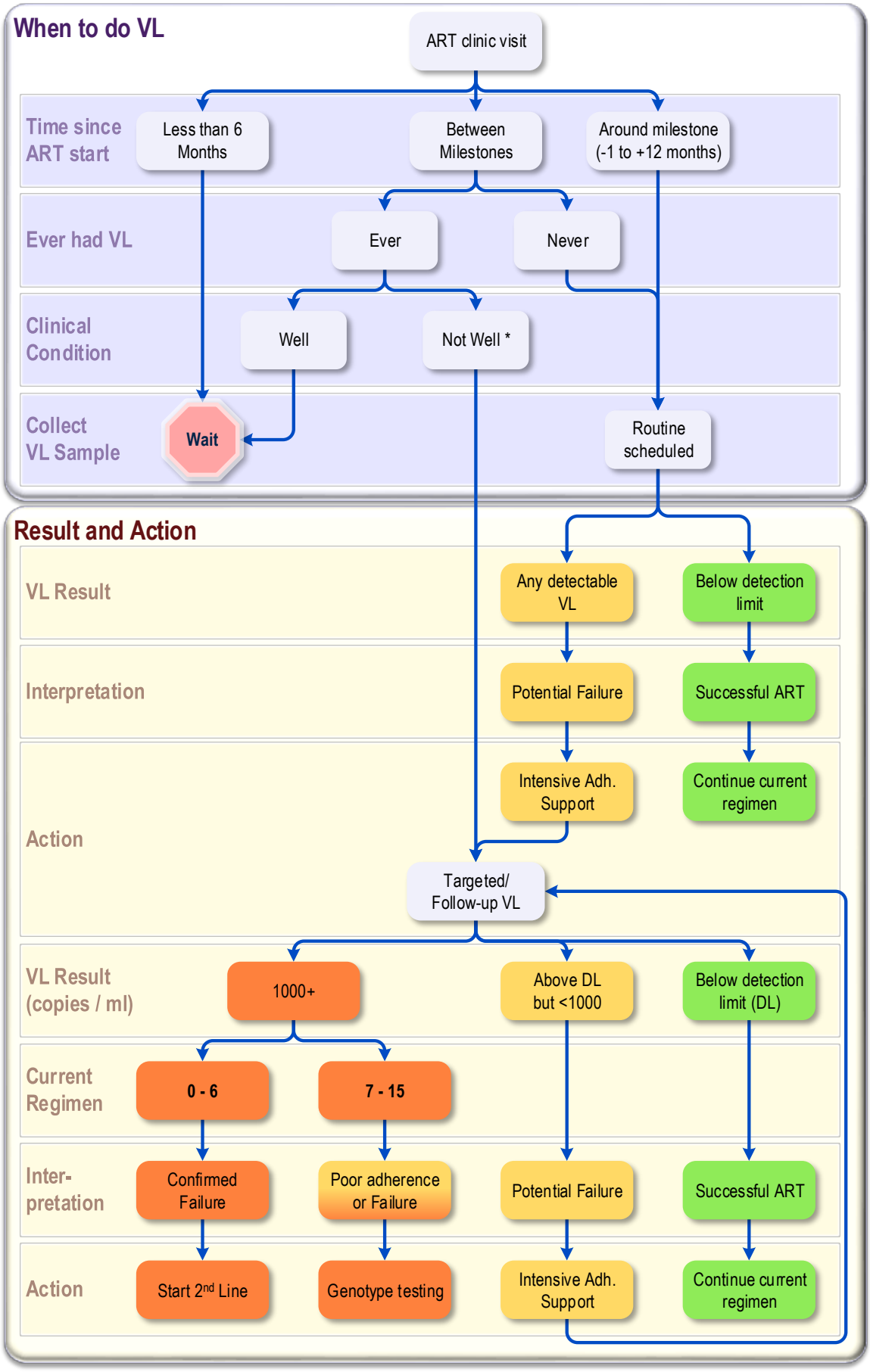
Potential treatment failure

Finding	**Routine** VL result detectable (even if below **1,000**)
Interpretation	Potential treatment failure
Action	Start intensive adherence counselling. Continue on the same regimen. Collect repeat VL after 3 months of good adherence.

Confirmed treatment failure

Finding	**Targeted / repeat** VL result **1,000+** *AND* Patient is **on NNRTI-based regimen (0, 2, 4, 5, 6)** *AND* **good adherence** in the 3 months before sample collection
Interpretation	The virus is likely resistant to the current ART regimen.
Action	Start / continue intensive adherence counselling. Initiate 2nd line ART without delay. 'Reset the clock' for routine VL monitoring: 6, 12 months, etc. after switch to 2nd or 3rd line. Note: Patients on **DTG- or PI-based regimens (7, 8, 9, 10, 11, 12, 13, 14, 15)** need genotype testing to confirm resistance before changing regimen. This is because a high VL on these regimens is likely due to adherence problems / poor absorption. continue current regimen while awaiting genotype testing results

Figure 4: Indication, Interpretation and Action for Routine Scheduled and Targeted VL Testing



* Any of the following: Significant unintended weight loss, failure to thrive, new or worsening HIV-related disease (suspected or confirmed)

13.10 Tracking Missed Appointments

- Tracing of missed ART appointments in Liberia are supported by both Government and implementing partners.
- Regularly review and update all patient ART cards and appointment register to identify patients who are overdue for their appointment as soon as possible.
- Try to contact the patient or the named guardian by phone or by home visit within 2 weeks after the missed appointment. Confirm from ART Patient Card that consent was given for home visit.
    - Patient is alive: counsel to return to the clinic as soon as possible and continue treatment.
    - Patient has stopped, died or transferred out: update outcome and date of outcome on patient treatment card and in register.
- Loss to follow-up (LTFU) and Defaults
    - Default: Patient is overdue for the appointment and is not known to have stopped ART, died or transferred to another facility.
    - LTFU: Patient has missed scheduled appointment for more than 28 days, and would have run out of ARVs 28 days or more since their last scheduled appointment date (based on the number of tins given at the last visit).
- Patients who are alive but known to have stopped ART (for any reason) should be classified as ‘stopped’ and not as ‘defaulted’.
- Ask guardians to notify the clinic if an ART patient has died. Bring back the patient health passport and/or ART ID and any remaining ARVs.

Table 15: Symptom-based Identification and Management of Side-effects

Cause (in order of likelihood)	**Diagnosis**	**Primary Management**	**Secondary Management**
Body pains, weakness			
AZT, 3TC	Severe anemia: Hb <7 g/dl	Stop AZT, consider transfusion	Substitute AZT, continue ART without gap
AZT	Lactic acidosis (LA): shortness of breath, nausea Serum lactate: suspect: 2-5 mmol/l, confirmed: ≥5 mmol/l	*Any suspected LA:* Stop all ART immediately IV fluids, treat at hospital	Don't re-start ART before lactic acid <2mmol/l Can re-start ART with AZT after suspected LA Never give AZT after confirmed LA Can use ABC or TDF containing regimen
Fever			
Onset independent of drugs: Bacteremia, malaria	FBC, MPs, blood culture, urine dipstick	Treat condition based on diagnosis.	In patients with Stage 3-4 disease with fever and negative RDT, especially if any danger signs, consider coverage with broad spectrum antibiotics and hospital admission for thorough evaluation including TB (see section 6.1)
Onset within 8 weeks of starting drugs: ABC, NVP, EFV	ABC, NVP or EFV hypersensitivity: Body pains, vomiting, diarrhea, abdominal pain, sore throat, cough, shortness of breath, rash, jaundice	Any suspected hypersensitivity: Stop all ART immediately, treat at hospital	Do not re-start before symptoms have resolved Never use NVP or ABC again Replace NVP with EFV and ABC with TDF

Cause (in order of likelihood)	**Diagnosis**	**Primary Management**	**Secondary Management**
Slimming: **Cheeks, forearms, buttocks, legs (often prominent veins) Fattening: Back of neck ('buffalo hump'), breast, stomach, and waist**			
AZT, LPV/r, 3TC, TDF, EFV	Lipodystrophy (from ART / HIV itself)	Reassure patient Substitute likely causative ARV	
Breast swelling / enlargement: one- or both-sided, in males or children			
EFV, ketoconazole, cimetidine, omeprazole, spironolactone, isoniazid testosterone deficiency (HIV), AZT, LPV/r	Gynecomastia: palpate enlarged breast gland Lipodystrophy: accumulation of fat (from ART / HIV itself)	Reassure patient Substitute EFV with NVP in ART regimen.	Consider surgery for extreme gynecomastia
Upper GI symptoms: Nausea, vomiting			
AZT, LPV/r, 3TC, DTG	Lactic acidosis ? (see '*Body pains and weakness*') Jaundice? (see 'Yellow eyes')	Adults only: Promethazine 25 mg up to 12-hourly. Adults or children (lower dose): Chlorpheniramine 10 mg up to 8-hourly-oral rehydration solution(ORS)	If no lactic acidosis: try to continuing the same ART regimen If persistent, substitute

Cause (in order of likelihood)	**Diagnosis**	**Primary Management**	**Secondary Management**
Skin Rash			
Onset before starting drugs: Seborrhoeic dermatitis ("bumpy itch")	HIV-related skin rash	Adults only: Promethazine 25 mg 12-hourly Adults or children (lower dose): Chlorpheniramine 10 mg 8-hourly Calamine lotion	Consider scabies, etc.
Onset within 8 weeks of starting drugs: NVP, ABC, Cotrimoxazole, EFV	Mild hypersensitivity Macular/papular rash not involving mouth, eyes, and genitalia No fever, body pain, weakness, etc.	Continue EFV, reassure: initial rash mostly resolves. Continue on half dose NVP (if on NVP starter pack) for further 2 weeks Adults only: Promethazine 25mg 12-hourly Adults or children (lower dose): Chlorpheniramine 10 mg 8-hourly	If no improvement on half dose NVP, stop NVP Substitute to EFV once rash has resolved. If patient unable to take EFV, consult with ART specialist for alternatives
Lower GI symptoms: Diarrhea, lower abdominal pain			
Onset before ART initiation: HIV-induced	Stepwise empirical treatment	Stepwise empirical treatment of chronic HIV diarrhea (see section 6.1.17)	
Onset within 6 weeks of starting drug: LPV/r, AZT, 3TC, DTG	Drug toxicity	For adults only: Loperamide 2 mg 8-hourly (mainly for LPV/r induced diarrhea)	Try to continue same ART regimen If persistent substitute

Cause (in order of likelihood)	**Diagnosis**	**Primary Management**	**Secondary Management**
Severe upper abdominal pain, nausea and vomiting			
No jaundice: 3TC	Pancreatitis Serum amylase >1.5 times above upper normal limit	Stop all ART immediately Treat at hospital	Restart ART after complete remission Use TDF- or AZT-containing regimen
Jaundice and/or severe RUQ: NVP, EFV, alcohol, viral hepatitis	Acute fulminant liver failure Liver function tests Screen for Hepatitis B and C	Discontinue ART immediately Treat at hospital Identify cause and manage accordingly	Never re-start NVP or EFV if this was the suspected cause Reinitiate ART one month after jaundice is resolved, and LFT <2.5 of upper normal limit
Yellow eyes			
Viral hepatitis, alcohol, ATV/r, NVP, INH, EFV, ABC, severe malaria, cancer	LFT and ultrasound scan to differentiate: Viral hepatitis, cirrhosis, drug hepatitis, primary liver cancer, metastases	Discontinue ART and IPT immediately if jaundice develops after start. See footnote 10 on page 42 for patients on ATV/r. Identify cause and manage accordingly (LFT, ultrasound, hepatitis serology).	Never re-start NVP or EFV if this was the suspected cause. Re-initiate ART 1 month after jaundice has resolved and LFT <2.5 times upper normal limit.
Swollen face and eyelids, particularly in the morning/tiredness, too much or too little urine			
Onset before starting drugs HIV, diabetes, hypertension	Confirm nephropathy with serum creatinine and urine protein	Identify cause and manage accordingly	Adjust ART dosage according to creatinine clearance
Onset within 1 year of starting drugs: TDF, streptomycin	Confirm nephropathy with serum creatinine and urine protein	Admit to hospital Substitute TDF to ABC without gap Stop streptomycin	Adjust ART dosage according to creatinine clearance

Cause (in order of likelihood)	**Diagnosis**	**Primary Management**	**Secondary Management**
Drowsiness, confusion, nightmares, insomnia, psychosis			
EFV, DTG	Neuropsychiatric EFV or DTG toxicity	Drowsiness/ bad dreams usually disappear after a few weeks without the need to discontinue ART. Take EFV before bed. Take DTG in the morning. Confusion / psychosis: replace EFV with NVP immediately	If intolerable beyond 2 weeks: replace EFV with DTG, or replace DTG with EFV as the case may be
Leg pain, numbness or burning, inability to walk			
Onset before starting drugs: HIV neuropathy Onset or worsening after starting drugs INH, vincristine Onset independent of drugs Alcohol, diabetes	Mild peripheral neuropathy (PN): no sleep disturbance	Amitriptyline 25 mg nightly for 4 weeks Pain control using WHO analgesic ladder	If no improvement after 4 weeks: stop amitriptyline, continue analgesics
	Moderate PN: sleep disturbance	Stop responsible drug WHO analgesic ladder	
	Severe PN: severe pain, muscular weakness		

13.11 Immune reconstitution inflammatory syndrome (IRIS)

- A small number of patients may get worse in the first 6 months after starting ART.
- The most common causes for this are (in the order of likelihood):
    - Undiagnosed / untreated OI, mainly TB
    - Poor adherence to ART
    - Drug-resistant TB (if on TB treatment)
    - IRIS
- IRIS is an over-aggressive response of the immune system caused by a sudden recovery on ART.
- IRIS appears as a severe bout / worsening of an OI:
    - TB
    - Cryptococcal meningitis
    - Herpes zoster
    - KS
    - Hepatitis
- IRIS should only be considered if the more common causes for worsening have been ruled out.
- Patients who start ART with very advanced AIDS are at a higher risk of developing IRIS.
- Recent / concurrent treatment for TB or cryptococcal meningitis.

13.11.1 Management of IRIS

- Confirm that ART is actually taken as prescribed.
- Continue ART if ART toxicity has been ruled out as the underlying cause.
- Treat the OI.
- Consider TB treatment failure if worsening occurs after more than one month on TB treatment.
- Admit severe cases to hospital.
- Seek specialist advice on whether NSAIDs and/or prednisolone should be given.

14 Differentiated ART Services

- Differentiated ART Service Delivery (DSD) is a patient-centered approach that adapts continuum of HIV services to the individual needs of PLHIV.
- DSD is promoted by WHO to improve the quality of care of the growing number of PLHIVs across the ART clinics.
- DSD tailors interventions based on the individual patient's clinical needs by reducing the burden of unnecessary clinical visits as well as helping the ART service provider prioritize additional care the patient may require.
- The choice of specific DSD model should be based on feasibility, affordability and clear benefit, to the patient and the health system.
- Commonly, differentiation of HIV care & treatment services delivery aim to cater for the varying needs of stable and unstable patients on ART.
- DSD clinics must have all patient information linked to the national data stream.
- Refer to specific SOPs for individual DSDs.
    - Standard operational definition of stable patient:
        - On the current ART regimen for 12 months+ without any side effects
        - No obvious opportunistic infections that could compromise ART
        - Latest VL within the last 24 months was below detection limit
        - Not pregnant or breastfeeding
        - Stable patients may be scheduled into approved MOH DSD models, including Teen Clubs, mobile clinics like ART-provider managed Community ART Groups, Drop-in-Centers, 3-6 multi-month prescription and pharmacy fast-track refills.
    - Standard operational definition of unstable patients (advanced illness) or patients at high risk of disease progression
        - Latest VL result above detection limit
        - WHO Clinical Stage 3 and 4
        - CD4 count of 200 and below
        - See Figure 4 for management of patients with advanced illness or at risk of disease progression. Patient with advanced illness must managed within the clinic settings.

15 Management of labor and delivery

15.1 HIV status ascertainment at maternity

- Review HIV status in the patient file on admission.
- Provide **new HIV test** for all women, who are:
    - Not already known to be HIV positive
    - Never tested or tested negative any time in the past, even if this result is from the last trimester.

15.2 ART provision at maternity

- Mothers already on ART: continue the same ART regimen at regular prescribed intervals. Pregnancy / breastfeeding are no indication to change women from any previous ART regimen.
- HIV positive mothers not yet on ART / who interrupted / stopped ART: emergency ART initiation
    - Start lifelong TDF/3TC/DTG (Regimen 13A) as soon as possible, during labor or after delivery.
    - Deliver individual ART counselling and IEC before discharge.

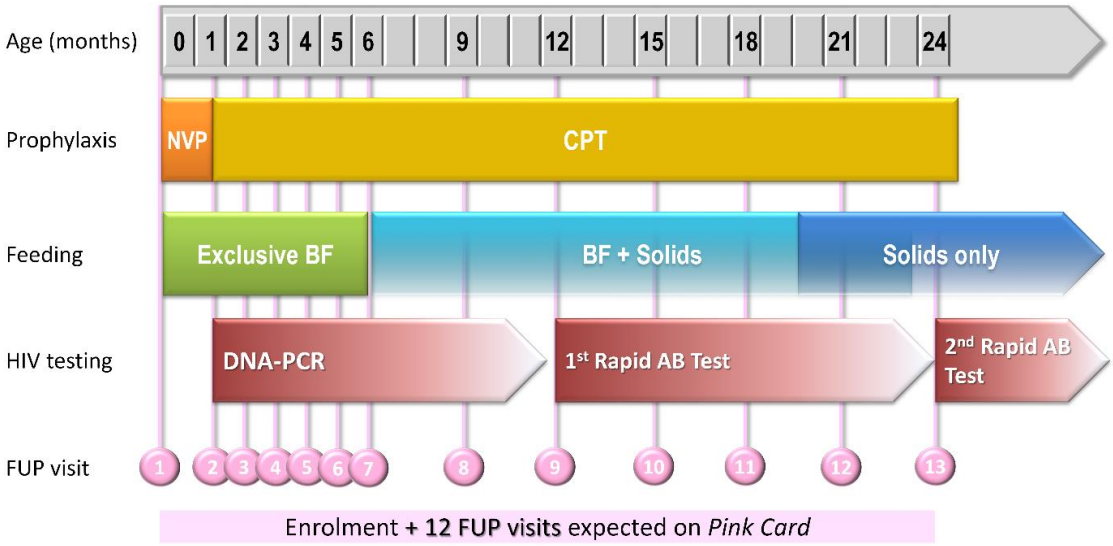
15.3 Reduce obstetric risk of HIV transmission

- Use a partogram to allow early detection and management of prolonged labor.
- Artificial rupture of membranes (ARM) increases the risk of HIV transmission.
    - ARM is not indicated if labor is progressing well.
    - If prolonged labor due to poor uterine contraction: perform ARM at ≥6cm cervical dilation and augment with oxytocin.
    - Ensure oxytocin has been stored in cold-box for vaccine or in refrigerator (2-8 degrees centigrade) before use to ensure potency.
- Do not perform routine episiotomy except for specific obstetric indications (e.g. vacuum extraction).
- Avoid frequent vaginal examinations.
- Do not ‘milk’ the umbilical cord before cutting.
- Do not suction with a naso-gastric tube unless there is meconium-stained liquor.
- Immediately after birth, wipe the baby dry with a towel to remove maternal body fluids.

16 New born care and postnatal follow-up

- Follow regular post-natal care.
- Give all regular EPI vaccinations to all babies born to HIV infected mothers (as for all other infants).
- See Figure 5 below for the schedule of HIV exposed child follow-up: NVP prophylaxis, CPT, feeding and HIV testing

Figure 5: Follow-up schedule for HIV Exposed Children



16.1 Initiating integrated mother/infant follow-up

- Ensure continued follow-up for HIV infected mothers and babies.
- Enroll baby in maternal and child health clinic (MCH) before discharge from post-natal ward:
    - Fill Exposed Child patient card, enter in MCH register.
- Mothers on ART before delivery:
    - Confirm next ART appointment.
    - Synchronize mother's ART appointment with baby's first MCH visit. Aim for first MCH visit at post-natal visit or first vaccination visit.
- Mother initiated ART in labor:
    - Fill ART patient card and enter in ART register.
    - Write baby's MCH registration number on mother's ART card.
    - Give regular 4-week ART + MCH appointment.
- If mother wants to continue MCH and ART at another facility:
    - Record 'transfer out' in HIV clinic and ART register and give mother her ART patient card and the baby's Exposed child card.

16.2 Infant and child feeding counselling

- Feeding recommendations are the same for all infants, regardless of HIV exposure or HIV infection status.
- Give only breast milk up to age 6 months.
- Gradually start complementing breastfeeding with suitable hygienically prepared foods from age 6 months (such as fruits, vegetables, beans, ground nuts and soya).
- Aim to stop breastfeeding around age 22 months, so that the final HIV test can be done at age 24 months (6 weeks after breastfeeding has stopped).
    - Stop breastfeeding gradually over a period of 1 month (no *rapid cessation*).
- Replacement feeding (formula) is **NOT** recommended unless women are unable to breast feed.
- Monitor weight, height and MUAC according to schedule using standard MOH charts and intervene if no adequate weight-gain.
- Give only medicines prescribed by a health professional.
- Start breastfeeding immediately after birth. Explain and observe optimal breastfeeding:
    - Empty both breasts properly to avoid breast engorgement.
    - Ensure proper attachment and positioning to minimize nipple cracks and fissures.
    - Watch out for signs of breast infection (pain, swelling, heat, redness)
        - Don't feed baby from infected breast. Express infected breast to avoid engorgement. Discard expressed milk – do not feed to baby.
        - Go to health facility for treatment of breast infections such as mastitis

16.3 Infant NVP prophylaxis

- NVP syrup is given to all babies born to HIV infected mothers.
    - NVP syrup protects the baby from HIV infection during the riskiest time of pregnancy, delivery and breast feeding.
    - Give NVP syrup to the baby 24-hourly for 6 weeks.
    - All babies should take NVP syrup for the same duration regardless of the mother's ARV regimen and regardless if the mother was taking ARVs at all.
- Store NVP syrup bottles and syringe: dark, cool, clean and dry and out of children's reach.
- Use an old syrup bottle filled with water to show how to draw 1.5ml of syrup in the syringe.
- Hand out one example syringe where the 1.5ml line has been marked with a pen.
- Squirt the syrup in the back of the infant's mouth between the cheek and the gum to ensure it gets swallowed.

- Rinse the dosing syringe carefully with clean water after every use and let dry.
    - Bring back to the health facility at the 6-week vaccination visit all NVP bottles (whether used or unused), to check for adherence.

16.3.1 Prescription and dispensing of NVP prophylaxis

- When to dispense NVP syrup for infant prophylaxis to take home:
    - At ANC (or maternity) as soon as the mother is known to be HIV-infected.
    - Unopened bottles of NVP syrup have a long shelf-life. Therefore, never delay dispensing until later in pregnancy. Make sure the expiry date is at least 2 months after the estimated delivery date.
    - Ask at every following visit if the NVP syrup and the syringes are still available. Replace without delay any items that may have been lost or spoilt.
- Dispense **2** x 100ml-bottles of NVP syrup with dosing syringe.

16.3.2 Dosing

- The dose of NVP syrup remains the same for the whole 6-week period – do not change the dose according to age or body weight, etc.
- Use the standard dose (1.5ml) If birth weight is unknown (home birth / no scale).

Table 16: Dosing of NVP Syrup for Infant Prophylaxis

Birth weight	NVP syrup (10mg per ml)
2500g or less	**1.0 ml** 24-hourly
Over 2500g / unknown	**1.5 ml** 24-hourly

16.3.3 Timing and duration

- Start giving NVP syrup as soon as possible after birth. The earlier the start, the more effective.
- NVP syrup can be started anytime between birth and 4 weeks of age if the mother presents late. Starting NVP prophylaxis later is less effective and may cause drug-resistant HIV if the baby is already infected (and needs to start ART).
- Stop giving NVP syrup when the infant is 6 weeks old. The infant will receive less than 6 weeks of prophylaxis if NVP syrup has been started late.

17 Pre-exposure prophylaxis (PrEP)

- HIV negative people who are at very high risk of getting infected with HIV can benefit from PrEP, as one of the bio-medical combination HIV prevention strategies.
- PrEP uses daily TDF/3TC or TDF/FTC tablets.
- PrEP is not yet in use as a public health intervention for HIV prevention in Liberia.

18 Post-exposure prophylaxis (PEP)

- HIV infection can be prevented after a high-risk contact with fluids from an HIV infected person.
    - Remove as much of the body fluid as may be possible
    - Provide link to HTS immediately, and if HIV positive- connect to ART as per guidelines. If HIV-negative, give a 30-day course of ARV prophylaxis (PEP)
    - Use risk evaluation matrix below.
- PEP, if taken correctly, reduces the risk of infection by 80%.
- ARVs taken for PEP are usually well tolerated.
- Keep ARVs for PEP accessible 24/7, e.g. at maternity or other well-advertised locations.
- Offer STI treatment and emergency contraception, for rape victims accessing PEP.

Classification of risk

- Use Table 17 to find out if the exposure is a possible risk for infection.
- Obtaining a new HIV test from the source person can help to reassure that the risk is low, but PEP should still be given if the test result is negative. The source person could be newly infected himself and may be in the window period.

Table 17: Classification of Risk of Transmission After Exposure to HIV

	Substance	Type of contact	Source person
Risk	• Blood • Semen • Vaginal fluid • Cerebro-spinal fluid • Pleural fluid • Amniotic fluid • Synovial fluid • Ascites fluid	• Skin penetrated with contaminated needle (hollow or non-hollow) • Large amount of substance on mucous membrane • Sexual intercourse no condom • Risk substance on lacerated skin / open wound	• Regardless of known/unknown HIV status
No Risk	• Urine • Stool • Pus • Tears • Saliva • Sputum • Nasal secretions	• Risk substance on intact skin	

- Severe anemia (<8g/dl) is contraindication for AZT/3TC.
- Severe renal failure is contraindication TDF/3TC.

How to start PEP

- Start taking PEP as soon as possible after high risk exposure, ideally within 2 hours.
- Starting PEP more than 72 hours after exposure is not effective and should not be done.
    - However, still perform HIV testing at baseline, at 3 and 6 months.
- Explain dosage and importance of adherence.
- Mild side effects (nausea, etc.) are not a reason to stop PEP.
- Advise to return immediately if serious side effects are suspected.
- Advise all exposed adults to practice safe sex until confirmed HIV negative at 3 months.
    - Give 30 condoms and re-supply as requested.
- Do not stop breastfeeding.
- Write case details in PEP register (improvised).

Table 18: Post Exposure Prophylaxis Regimens and Dosage (number of tabs taken)

	Standard						Alternative			
	AZT 60mg / **3TC** 30mg		**AZT** 300mg / **3TC** 150mg		**TDF** 300mg / **3TC** 300mg / **DTG** 50mg		**ABC** 60mg / **3TC** 30mg		**AZT** 300mg / **3TC** 150mg	
Weight										
3.0 – 5.9 kg	**1**	**1**					**1**	**1**		
6 – 9.9 kg	**1½**	**1½**					**1½**	**1½**		
10 – 13.9 kg	**2**	**2**					**2**	**2**		
14 – 19.9 kg	**2½**	**2½**					**2½**	**2½**		
20 – 24.9 kg	**3**	**3**					**3**	**3**		
25 – 29.9 kg			**1**	**1**					**1**	**1**
≥ 30.0 kg					**1**	**0**			**1**	**1**

PEP follow-up

- At 30 days: (after completing ARV prophylaxis)
    - Assess adherence
    - Give 60 condoms
- At 3 months and 6 months: repeat HIV testing

Additional prevention measures after rape / sexual exposure

- Give emergency contraception (EC) within 72 hours if needed (see Table 19)
    - Repeat dose if vomiting occurs within 1 hour of taking EC.
    - Explain that next menstrual period should occur before or around the expected time.
- Consider giving presumptive treatment for STIs using Table 20
- Follow *National Guidelines for Provision of Services for Physical and Sexual Violence (SGBV)*

Table 19: Regimens and Dose for Emergency Contraception

Contraceptive drug	Immediately	After 12 hours
Postinor 2 (750µg levonorgestrel)	2 tablets	
OR		
Lo-Feminal or Microgynon	4 tablets	4 tablets

Table 20: Dosing of Standard Presumptive STI Treatment After Sexual Exposure

STI drug	Child <15 years	Adult
Benzathine pen. vials	50,000 IU/kg IM stat (max 2.4 million IU)	2.4 Mega Units IM stat
Gentamicin vials	7.5 mg/kg IM stat (max 240mg)	240mg IM stat
Erythromycin tabs	12.5 mg/kg 6-hourly for 14 days (max 500 mg per dose)	500mg 6-hourly for 7 days
Metronidazole tabs	5 mg/kg 8-hourly for 7 days (max 2 g per day)	2g stat
Nystatin pessaries	N/A	100,000 units 12 hourly for 7 days

19 Pharmacovigilance

NACP: Important Points to Note

- Pharmacovigilance refers to the activities set up for the detection, assessment, understanding and prevention of adverse effects or any other drug related problems.
- Adverse drug reactions (ADRs) can be detected by either a patient or guardian or health care practitioner.
- Report all ADRs (minor and serious) that are a concern to either a patient or guardian (e.g. persistent fever) and to the health care provider (e.g. jaundice).
- All ADRs should be reported within 48 hours to NACP and the Liberia Medicines and Health Product Regulatory Authority (LMHRA). Serious ADRs (e.g. death) must be reported within 24 hours.
- Adverse drug reactions are considered serious if they result in any of the following: death; life-threatening; disability; hospitalization/prolonged hospitalization; congenital anomaly; require intervention to prevent impairment/damage and; any other important medical event.

19.1 How to fill in the ADR Reporting Form

- All sections of the form must be filled in with adequate details. The following basic information is required before the form is acceptable:
    - Identifiable source of information or reporter
    - Identifiable patient
    - Name(s) of the suspected product(s)
    - Description of the suspected reaction
- The form contains the following 5 sections:
    - Fill in section 1 with the Patient Information for example name, age, date of birth and gender.
    - Section 2 contains information of the Adverse Event. Key areas include the date of onset and brief description of the ADR as well as action taken (e.g. drug withdrawn or dose reduced). If any laboratory tests have been conducted to investigate the ADR, these must also be filled in with their results. If the outcome is death the date of death must be indicated.
    - Section 3 provides information of the suspected drug that caused the ADR. Both the generic and brand name as well as batch number should be indicated.

- Indicate in section 4 other drugs including herbal remedies that were taken prior to the ADR.
- The reporter's information must be indicated in section 5, in order for NACP and Liberia Medicines and Health Products Regulatory Authority (LMHRA) to follow up on the case should more information be required.

19.2 How to handle serious ADRs

- Any serious adverse event should be reported immediately to the next level using the easiest and fastest mode of communication for example phone call, email, SMS. This should be followed by a written report that must be sent within 24 hours of the event occurring.
- Serious ADRs will be investigated by a qualified team and the report will be shared to the NACP, Liberia medicines and pharmacy regulator Board as well as reporting site.

20 Monitoring and evaluation

NACP: Important Points to Note

- NACP relies heavily on accurate and timely data for planning, reporting to donors and for drug procurement and distribution.
- Data analysis and reporting is done from patient cards and clinic registers at most facilities, but electronic systems for monitoring are used at some sites with a high number of recipients of care.
- Reporting is done monthly for ANC, maternity and exposed child follow-up and for ART (see Table 21).
- All HIV reports are to fall part of the integrated HMIS reporting form for submission to the County Health Team, through the district offices.
- Reports from facilities are to be completed within 5 working days after the end of the reporting period.
- HIV Program reporting will be further integrated into the regular Health Management Information System. Monthly facility reports will be entered directly into the District Health Information System at the District Health Offices for national reporting.

20.1 Definitions

PMTCT site

- A facility is counted as a PMTCT site if they have initiated on ART at least one pregnant or breast feeding woman during the reporting period.
- Depending on the mode of integration of PMTCT/ART interventions into the general health services, ART may be initiated in any of the following service points: ART, ANC, maternity, post-natal or under 5 clinic.

ART site

- A facility is counted as an ART site if they had retained at least one patient alive on ART at the end of the reporting period.

ART status at registration

- Refers to the patient's status at the time of first registration at this ART clinic – this status will never change as long as the patient remains at this clinic.
- **First time initiation:** Never taken ART (triple ARV combination treatment) in the past. PEP, PrEP and PMTCT prophylaxis are not regarded as first time initiation (Tx_New)
- **Re-initiation**: Received ART (triple ARV combination for treatment) from another ART site in the past but has NOT been taking it for 2 weeks or more as of the day of registering at this clinic. Patients who have interrupted for 2 weeks or more need to take a starter pack for re-initiation (if started on a regimen containing NVP).
- **Transfer in**: Received ART from another ART site in the past and is currently taking ART or has interrupted for less than 2 weeks. Count as *Transfer In* regardless if the patient brings his old patient card or not ('official' or 'unofficial' transfer).

Defaulted / Lost to follow-up

- Patients are counted as 'defaulted' if they have not returned to the clinic and are not known to have transferred out, stopped or died.
- The following times apply in the different clinics:
    - HCC (HIV exposed children): 3 months after the *Next Appointment Date* given at the last visit.
    - ART: 3 months after the patient is expected to have run out of ARVs.
- Patients may revert to 'alive on ART' when the next report is done if they return to the clinic and continue ART.

ART stop

- Patients are counted as 'stopped' if they are last known to be alive and have stopped taking ART. Stop is used regardless:
    - Of the reason the patient has stopped (clinician's or patient's own decision).
    - If the ART interruption is intended to be permanent or temporary.
    - Of the duration of the ART interruption at the time of doing the cohort analysis.
- Patients may revert to 'alive on ART' at the next cohort analysis if they re-start ART.

Died

- Patients are counted as 'died' if there is a reliable report about the patient's death. 'Died' is used regardless:
    - Of the cause of death (HIV- or non-HIV related disease, accident, suicide or homicide).
    - If the patient was on ART or not at the time of death.

ART re-start

- Interrupted ART for more than 2 months while registered at the respective ART site. Update the number of re-starts in the ART clinic register whenever the patient re-started ART after defaulting or stopping for more than 2 months (i.e. returns after 'defaulting'). Patients who have interrupted for 2 weeks or more need to take a starter pack for re-initiation (if started on a regimen containing NVP).

ART adherence level

- Reporting of adherence levels is based on a classification of the number of doses missed at the last visit before the end of the quarter evaluated.
- The translation of the number of doses missed into adherence % depends on the number of days since the last visit. In practice, it is too complicated to consider varying intervals when analyzing cohort adherence. Therefore, 2 monthly visits are assumed for all when classifying adherence for reporting.
- Patient who are supposed to take 1 tablet per day (e.g. Regimen 5A) and who have missed more than 3 tablets are classified as 'less than 95% adherent'.
- Patients who are supposed to take 2 tablets per day (e.g. Regimen 1A) and who have missed more than 6 doses are classified as 'less than 95% adherent'.

Table 21: Overview of M&E Systems for Integrated HIV Program Reporting

Service	M&E tools		Report cycle	Report elements			
	Patient card	Register		New registrations	Cohort outcomes		
					Definition of cohort	Primary outcomes	Secondary outcomes
ANC	–	ANC Clinic Register	Monthly	New first visits	• Registration group (6 months after first ANC visit)	–	(Final status at end of ANC) • HIV test status • On ART
Maternity	–	Maternity Register	Monthly	New deliveries	–	–	–
ART	ART Patient Card (separate cards for pediatric and adult formulations)	ART Clinic Register	Monthly	Patients newly registered at ART clinics	• Cumulative (all ever registered) • Registration group (survival analysis)	• Alive on ART • Died • Defaulted • Stopped ART • Transferred out	• ART regimen / formulation • Adherence level • Side effects • TB status • On CPT • Using FP
Exposed child FUP	HIV Care Patient Card, Exposed Child Under 24 Months	HIV Care Clinic Register	Monthly	Patients newly registered at HCC	• Birth cohort: children who (would) have turned 2, 12 and 24 months of age	• Alive in exp. child FUP • Discharged uninfected • Started ART • Defaulted • Transferred out • Died	• Age when received DNA-PCR result • Latest HIV status

20.2 Reporting of registration data

- For all new patients registered, baseline data (such as age at registration, sex, pregnancy status, clinical stage, etc.) are recorded on patient treatment cards and copied into the clinic register.
- These details do not change over time and tallying of these data needs to be done only once when reporting on new patients registered during the reporting month.
- *Page summaries* in the clinic registers are filled as soon as each page is full. Count the number of circled values for each column on the page.
- **Monthly reports** are obtained by adding the page summaries from each page in the respective reporting month.
- **Cumulative registration reports** are obtained by adding the data from the new monthly or quarterly registration report to the data from the previous cumulative registration report.
- Data elements in most sections should add up to the respective total number of patients registered.
    - Males, non-pregnant females and pregnant females must add up to the total number registered.
    - Age groups must add up to the total number registered.
    - ART status (first time initiations, re-initiations, and transfer ins) must add up to the total number registered.
- Some registration data (such as the number of patients with KS at the time of ART initiation) are counted separately and are not part of a section. These data elements are not expected to add up to the total number registered.

20.3 Record keeping and filing

Confidentiality of patient records

- All patient cards and clinic registers are property of the NACP/MOH and may only be kept at the respective facility or at the National Archives.
- Patient cards and clinic registers must be kept in a locked room and are only to be accessed by clinic staff responsible of providing the respective service and by the national supervision team. Patients and named guardians have access to their own patient card.

Use of clinic registers (ANC, Maternity, HCC, ART)

- Keep patient registration for each different service centralized in each facility: Use only one set of registers in each facility, except for HCT registers in large facilities.

- Each patient has only one row[19] in each register. However, for recipients of care returning after a transfers and re-starts after default or stop, assign new row in the ART register.
- Turn to a new page when starting to register patients in a new quarter. Leave any unused rows at the bottom of the previous page empty. This is to separate the quarters when adding page totals.
- Assign continuous registration numbers (by sequence of registration). Take care not to duplicate registration numbers.
    - Continue assigning cumulative registration numbers in the ART-Register. These number series are never re-started.
    - Re-start assigning registration numbers annually for the HCT, ANC- and Maternity Register. Re-start with number 1 on the 1st of January.

Use of patient cards

- Each patient has only one patient card at any one time (Exposed child, ART). Attach another patient card once the old card is full.
- Patient cards are filed in polythene sleeves in lever arch files, up to 100 cards per arch file.
- Separate filing systems are used for the different types of patient cards:

Exposed Child under 24 Months cards

- File in batches by year and month of birth.
- Within each birth month, sort in ascending order by HCT registration number.
- Do not remove the cards of children who have started ART, died, defaulted or transferred out from this filing system.
- Files with birth cohorts who (would) have now reached at least age 3 years can be removed from the clinic for archiving.

ART Patient cards, pediatric and adult ARV formulations

- File ART Patient Cards in ascending order by ART registration number.
- Prepare separate filing systems for **ACTIVE** (retained in ART) and **INACTIVE** patients (stopped ART, transferred out, defaulted, died).
    - Label the **ACTIVE** files with ART numbers 1-100, 101-200, 201-200, etc.
    - Label the **INACTIVE** files with ART numbers 1-200, 201-400, 401-600, etc.
- One arch file can hold approximately 100 cards.

[19] In the ANC register, each woman has one separate section with rows for each subsequent visit.

- Each time the monthly reporting is done, update in the ART register the outcome for patients who have dropped out of ART (stopped ART, transferred out, defaulted or died). Straight after this, move these cards from the **ACTIVE** to the **INACTIVE** filing system.
- Do not separate **pediatric** and **adult ARV formulation** cards into different files.

20.4 Ensuring adequate data quality

- Use only the standard national reporting forms.
- The clinic's own reports are checked by the supervision team each quarter from primary records.
- Copies of the checked reports are kept at the clinic.

20.5 Patient Identification Code

- Under the National AIDS Control Program, specific codes have been derived in order to uniquely identify patients enrolled in care.
- The Unique Code or otherwise referred to as the Facility UIC is made up of the following:
  A. County Code
  B. Facility Acronym
  C. Year of Enrolment in Care
  D. Serial Number
  E. Population Type (00=Gen Pop; 01=MSM; 02=FSW; 03=Trans)
- For example: 30-JFK-19-2124-00
- Unique Codes must be assigned to every recipient of care by the attending clinician enrolling the person. Exposed infants are to assume the mothers code with an "a" or "b" attached until as such time when he/she is declared negative. If declared HIV positive, that child must be given their own unique code.
- Other codes that will be associated with recipients of care are the HCT number (taken from the serial numbers provided in the HCT ledger), ART number (taken from the serial number provided in the ART ledger) and the Facility Master Registration Number.

21 Supply Chain Management

This section describes the supply chain management system that supports the HIV/AIDS Program to operate and scale-up the HIV Prevention, Care and Treatment services for the attainment of the 90-90-90 goal in Liberia. This section also depicts the movements of HIV products within the supply chain levels to support the implementation of HIV services at the service delivery points.

Any time the guidelines are updated to introduce new products or a new regimen in the health program, the supply chain system must be reviewed to adapt and align to the change. With the transition to TLD, and the scale-up of the differentiated service delivery approach, adjustments in the inventory system will be required:

- To monitor and report stock status, the new TLD drugs are to be included in the Logistics Management Information system (LMIS) tools.
- Implementation of the differentiated service delivery using the three-month national supply replenishment cycle inherently leads to massive stock outs of ARVs in the national supply chain system.

To implement the supply chain system, close in-country coordination is required from the Global Fund Programme Coordinating Unit (PCU), the pharmacy division and the Supply Chain Management Unit (SCMU) of the Ministry of Health, the National Aids Control & STI Program (NACP), Central Medical Store (CMS), County Health Teams (CHT) and the health facilities (HF). Together, these entities support the following activities:

- Implement timely distribution of ARVs and lab supplies to avoid interruption of HIV care and treatment, and laboratory testing services to avoid drug resistant HIV.
- All health facility staff must support the supply chain management by accurate filling and timely reporting of the LMIS forms.
- The county health supply chains teams manage and account for all commodities they receive for all facilities through regular monitoring, and timely review and entry of logistics data into eLMIS.
- A dedicated NACP supply chain team works with the Supply Chain Management Unit (SCMU), Central Medical Store (CMS), Program Coordination Unit (PCU) and implementing partners to ensure timely and uninterrupted supply of health commodities.
- The Program Coordinating Unit (PCU) of the Ministry of Health actively coordinates GFTBM procurement, supply planning and distribution of medicines and lab supplies for the effective implementation of the HIV/AIDS and STI Program.
- NACP resources, internal operational processes and procedures are aligned to give support to the supply chain needs and the overall implementation of the programme.
- Authorization from the NACP supply chain unit is required before any of the following activities involving ARVs and HIV test kits movements are commenced:
    - Requesting additional supplies from central medical store
    - Moving stocks from one facility to another
    - Disposing expired / damaged stocks

Additionally, MOH and CMS support emergency distribution, particularly for replenishment between distribution cycles to ensure continuous availability of ARVs and test kits at facilities to provide uninterrupted HIV services to clients.

For effective coordination, please contact NACP Supply Chain Unit by email: **nacpscu@gmail.com** or, during working days between 8:30 – 16:30, by mobile phone to request assistance:

O777742460 (ORANGE)
0886317095 (MTN)

21.1 HIV commodity supply cycle

Table 22: Drugs and Testing Supplies Managed by the HIV Program

Commodity group	Examples	Supply*
ARVs	(All ARVs, incl. PEP and infant prophylaxis)	**E**
OI	Cotrimoxazole for CPT	**E**
	Isoniazid + pyridoxine for IPT	**E**
	Cotrimoxazole, other antibiotics, fluconazole, chemotherapy	**S**
STI	Standard / alternative antibiotics, acyclovir, clotrimazole	**S**
PIFP	Condoms, Depo-Provera	**S**
Analgesic	Morphine, codeine	**S**
DBS kits	for EID and VL samples	**E**
Tests	HIV and syphilis rapid test kits	**E**

*__E__ = managed exclusively by HIV Program. __S__ = supplemented by HIV Program in addition to essential medicine supplies.

- Logistics data about resupply quantities originates from the health facilities and moves upward to the county health team where data is entered into the eLIMIS. From the CHT, the data is made available to users digitally.
- The ARVs and medical supplies move downward from the central medical store (CMS) to the county depots, and from the county depots the commodities are distributed to the health facilities. ARVs and medical supplies are directly distributed from the county depots, except for Montserrado County where health commodities including ARVs are distributed directly from the central medical store (CMS) to the health facilities.
- The supply chain system implements a quarterly supply distribution cycle and an ongoing management of the ARVs and medical supplies as depicted in the figures below.

Figure 6: Flowchart for Routine HIV Commodity Supply Management in Liberia

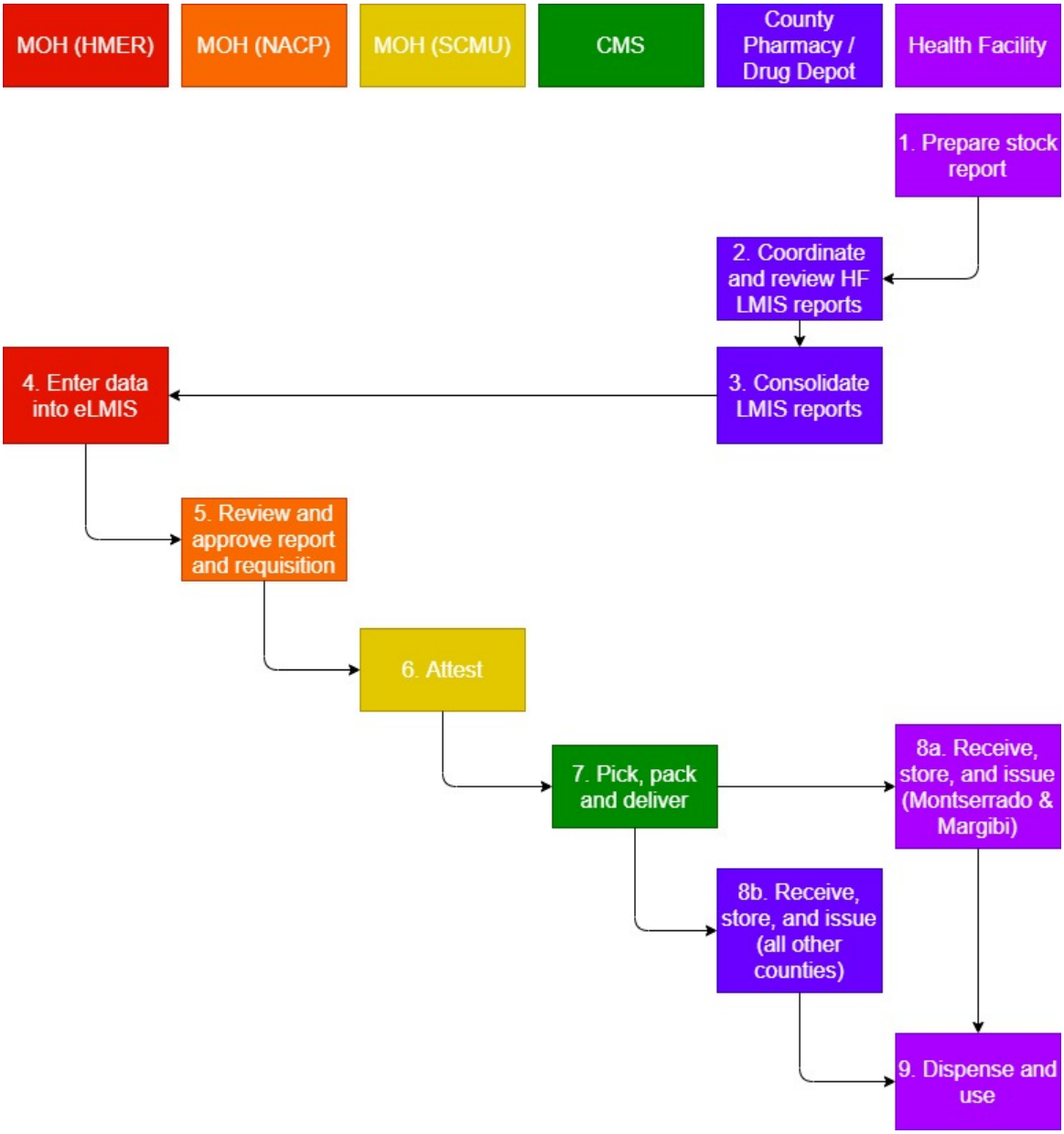
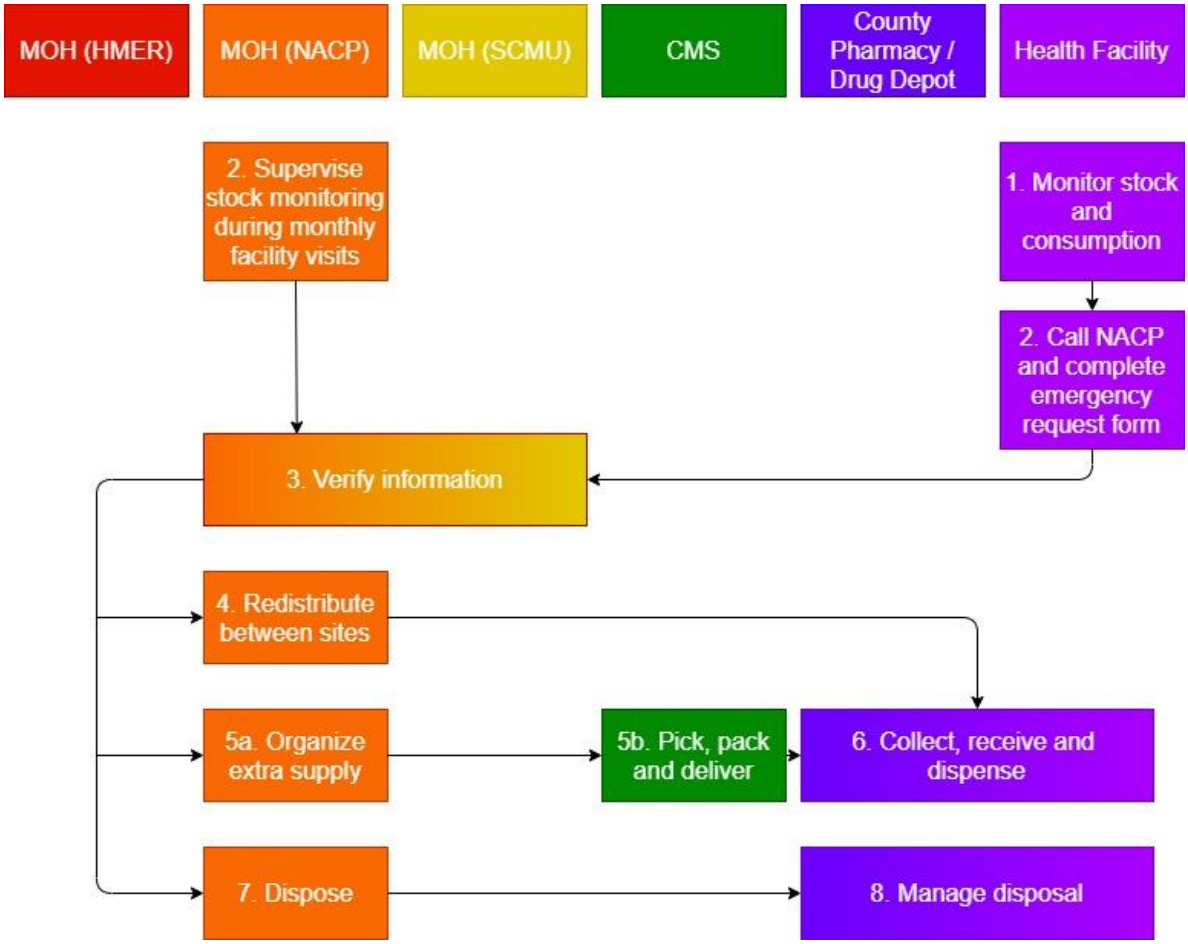


Figure 7: Flowchart for Emergency HIV Commodity Supply Management in Liberia



21.2 Preparing the Stock Report

Health facility staff should use the facility-based LMIS tool to obtain the following information to complete the Stock Status Requisition and Report (SSRR) Form**:**

- Obtain consumption data from dispensing register (DR)
- Obtain stock on hand data from stock card or physical count report
- Obtain number of days commodities out of stock from stock card
- Obtain losses and adjustments data from stock card or from internal requisition form

Health facility staff are required to complete the SSRR form at the end of every quarter to request for regular resupply of program drugs and supplies for their facilities. They are also required to complete an emergency requisition (ER) form to request for emergency supplies at any time during the program working hours. The following activities should be implemented before completing the LMIS tool:

- Confirm each commodity is sorted by expiry date
- Exclude all expired drugs from being counting
- Ensure all stocks are available to be counted, including those in bulk store, at the clinic store and at HIV testing rooms, etc.
- Do physical count to determine the stock on hand (SOH)

21.3 Processing the County Requisition

- The facility requisition quantities are calculated by the county pharmacist based on the data available in the facility paper-based LMIS tool, which are collected and reported to the county pharmacist on a quarterly basis.
- Resupply requisition quantities are entered into the eLMIS platform by the M&E team at the county level. The eLMIS platform is managed by the HMER team at the Ministry of Health.
- The NACP supply chain team reviews the requisition quantities against available stock information and patients' data before approving quantities via digital eLIMIS.
- The SCMU monitors, reviews and attests the quarterly requisition quantities and the CMS processes and delivers the commodities to the county health teams. CMS delivers a three-month of stocks and an additional two- month buffer stocks to the counties to be distributed to the facilities.

21.4 Receiving ARVs and Medical Supplies at Facility Store

- Medicines and medical supplies should be received by the facility stores according to the recommended practices of the Ministry of Health (MOH).
- The person receiving the commodities at the facility should inspect the entire consignment in the presence of a witness designated by the facility office in charge (OIC), and perform the following tasks:
    - Physically count all re-packed / loose units. Originally sealed boxes do not need to be opened for counting of units. Add up total units received for each item.
    - Check expiry date for all items.
    - Write the physical count for each item into the respective box on the delivery document. Write 0 (zero) for any items not received – don't leave any check box empty.
- Sign, date and stamp the *delivery note* to confirm receipt of the items as indicated.
- The person signing on the delivery note is accountable for all items s/he has signed for. The Officer in-Charge (OIC) of pharmacy / facility will be held responsible for any discrepancies noted later.

21.5 Moving ARVs and Medical Supplies to Storage

- Immediately move all items received at the facility into a secure storage area (clean, dry, cool and off the floor).
- Enter quantity and date of receipts on *stock cards* without delay.
- Arrange items by expiry date to make it easy to follow the *First Expiry -First Out* (*FEFO*) principle.

21.6 Issuing ARVs and Medical Supplies to Clinic or Pharmacy

- Fill *Requisition and Issue Vouchers* for all commodities requested from the clinic.
- Follow the First Expiry- First out (*FEFO)* principle ALWAYS.
- Update *stock card* immediately when moving items out of the pharmacy/clinic.

21.7 Dispensing ARVs and Medical Supplies to Patients/Clients

- Account for all HIV commodities dispensed. Specify type and quantity on HIV Counselling and Testing Register (HCT)
- The *HCT Ledger* is used for tracking use of HIV test kits.
    - Keep a separate register at all places where HIV testing is done.
    - Use separate pages for the different types of tests (Determine, Bioline, Uni-Gold).
    - Test kits *used for clients* must match entries in the HIV testing Register.
    - Fill monthly summary on HIV testing report by adding numbers from all HCT used at the facility.

21.8 Monitoring the Stock / Consumption Level at Facility

- Do a **physical stock count** for all items (in store and at the clinic) and update stock cards:
  - On the last working day of each month.
  - When handing over pharmacy management to another staff member.
  - Whenever discrepancies are noted.
- **Calculate** average monthly consumption (**AMC**) and months of stock (**MOS**) for all ARVs and HIV test kits after doing the monthly physical count:

$$\mathbf{AMC} = \frac{\text{units used in month1} + \text{month2} + \text{month3}}{3}$$

$$\mathbf{MOS} = \frac{\text{Total stock on hand from physical count}}{\text{AMC}}$$

- Be alert: commodity shortages can be anticipated before they happen:
  - Large number of transfers in.
  - Patients moving to 2nd line or alternative regimens.
  - Rapid growth through new initiations.
- As soon as commodity **shortage** is **suspected or noticed**:
  - Contact NACP supply chain unit for additional supply (see contact information above).
  - Inform all relevant staff members of the suspected shortage to act swiftly.
  - Prioritize use (e.g. HIV test kits for sick patients needing to start ART, women at ANC and maternity, etc.).
- For excess commodity more than **4 MOS**, especially when you notice units will expire before they can be used, establish contacts to be redistributed.

21.9 Requesting Adjustment and Stock Redistribution

- Whenever there is a risk of stock expiry or medicine stock out, health facility staffs should establish contacts with a neighboring facility, county pharmacist, and county HIV focal person or HIV program. The stock should be redistributed in line with the integrated MOHS commodities redistribution strategy.
- Before establishing contact, prepare the following information:
  - Number of tins / bottles / test kits remaining
  - Expiry date for each ARV and type of kit
  - Number of patients on this regimen at your facility and approximate average monthly consumption (AMC)
  - Estimate the number of days in which additional stocks will be needed
  - If own transport is available, organize it and be on the alert.

21.10 Managing Disposal of ARVs and Facility

- Separate expired commodities from usable stock as soon as possible.
- Notify NACP Supply Chain unit, and fill ***Registration Form for Disposal***
- Contact the County-Pharmacist and arrange for transfer of expired

22 Management of Viral Hepatitis and HIV

NACP: Important Points to Note

- Viral hepatitis is an infection that causes liver inflammation.
- The condition can resolve on its own or can progress to fibrosis (scarring) cirrhosis or liver cancer.
- Hepatitis B, C and D viruses can cause acute and chronic or long-lasting infections. Hepatitis B and C are the commonest in Liberia.
- Hepatitis B is transmitted through sex and contact with blood and body fluids.
- Hepatitis C is transmitted through feco-oral route, especially through contaminated foods.
- A lot of people are co-infected with HIV and viral hepatitis.

22.1 Hepatitis B

Clinical signs

- Acute Hepatitis B viral infection: some people do not have symptoms including newly-infected HIV adults, but some present with signs of hepatitis B immediately after becoming infected. Symptoms may include: Loss of appetite, tiredness, nausea, vomiting, fever, abdominal pain, joint pain, clay-colored stools, dark urine and jaundice (yellowing of the skin or the whites of the eyes).
- Chronic Hepatitis B Viral infection: most people do not have symptoms at all and can remain free of symptoms for years. Symptoms may be similar to acute HBV when and if they are present, and may be a sign of advanced disease.

Diagnosis:

- Tests for acute infection in standard labs: HBsAg, plus IgM anti-HBc or HBV DNA
- Tests for chronic infection: HBsAg, anti-HBs, Total anti-HBc, and HBV DNA

Primary Management:

- Give treatment for both HIV and HBV for life.
- Preferred first-line for adolescents and adults: give regimen 5: TDF+3TC+EFV fixed dose combination (Do not initiate DTG based regimen).
    - Advise on decreasing the intake of alcohol.

- Monitor for renal function and bone function at least every year. If tenofovir-renal damage occurs reduce tenofovir.
- Entecavir (if available) may be an option as part of another HIV regimen, not containing DTG, if tenofovir cannot be given at all and with no exposure to lamivudine (this will be a non-standard regimen. Only ART-trained medical doctor should provide guidance)

- Preferred first-line for children ≥ 3yrs: **give regimen 4: AZT+3TC+EFV**
  - Alternative: Give regimen 2 - AZT+3TC +LPV/r
- Preferred first-line for children ≤ 3yrs: **give regimen 9 or 11** ABC (or AZT) +3TC+LPV/r

22.2 Hepatitis C

Clinical signs

Same as hepatitis B.

Diagnosis / Investigations

- Tests for acute infection: as of now, there are no blood tests to determine acute infection.
- Tests for chronic infection: anti-HCV and confirmatory NAT (to detect and quantify HCV RNA).

Primary Management

- HCV can mostly be cured but the management is more complicated than hepatitis B.
- **Always consider drug-drug interaction**! The ART choice for individuals with coinfection is the same as for those infected with HIV alone.
- Give: available HCV treatment or daily fixed-dose of Ledipasvir (90mg)/sofosbuvir(400mg) for 12 weeks with regimen 5: TDF+3TC+EFV fixed dose combination (Do not initiate DTG based regimen).
- Renal monitoring is required.
- Pregnant or breastfeeding women: TDF+3TC(or FTC)+EFV with available HCV treatment
- Preferred first-line for children ≥ 3yrs: ABC+3TC+EFV with available HCV treatment
- Preferred first-line for children ≤ 3yrs: ABC (or AZT) +3TC+LPV/r with available HCV treatment

23 Appendix

Figure 8: Body Surface Area Estimation for Calculation of Paclitaxel Dose

BSA	Height in cm																									
Weight in kg	140	142	144	146	148	150	152	154	156	158	160	162	164	166	168	170	172	174	176	178	180	182	184	186	188	190
36	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.4
38	1.2	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
40	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.5
42	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.5
44	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
46	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.6
48	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.6
50	1.4	1.4	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
52	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.7
54	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.7
56	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
58	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
60	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.8
62	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8
64	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
66	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9
68	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9
70	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9
72	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
74	1.7	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0
76	1.7	1.7	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0
78	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
82	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1
84	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1
86	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
88	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
90	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2
92	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2
94	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2
96	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
98	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3
100	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3
102	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3
104	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
106	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4
108	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4
110	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4
112	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4
114	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5
116	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.5
118	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.5
120	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.5

Figure 9: Body Mass Index for Assessment of Nutritional Status in ART Clinics

Body Mass Index (BMI) Chart for Adults

Obese (>30) | Overweight (25-30) | Normal (18.5-25) | Underweight (<18.5)

HEIGHT in feet/inches and centimeters

WEIGHT		4'8"	4'9"	4'10"	4'11"	5'0"	5'1"	5'2"	5'3"	5'4"	5'5"	5'6"	5'7"	5'8"	5'9"	5'10"	5'11"	6'0"	6'1"	6'2"	6'3"	6'4"	6'5"
lbs	(kg)	142cm		147	150	152	155	157	160	163	165	168	170	173	175	178	180	183	185	188	191	193	196
260	**(117.9)**	**58**	**56**	**54**	**53**	**51**	**49**	**48**	**46**	**45**	**43**	**42**	**41**	**40**	**38**	**37**	**36**	**35**	**34**	**33**	**32**	**32**	**31**
255	(115.7)	57	55	53	51	50	48	47	45	44	42	41	40	39	38	37	36	35	34	33	32	31	30
250	**(113.4)**	**56**	**54**	**52**	**50**	**49**	**47**	**46**	**44**	**43**	**42**	**40**	**39**	**38**	**37**	**36**	**35**	**34**	**33**	**32**	**31**	**30**	**30**
245	(111.1)	55	53	51	49	48	46	45	43	42	41	40	38	37	36	35	34	33	32	31	31	30	29
240	**(108.9)**	**54**	**52**	**50**	**48**	**47**	**45**	**44**	**43**	**41**	**40**	**39**	**38**	**36**	**35**	**34**	**33**	**33**	**32**	**31**	**30**	**29**	**28**
235	(106.6)	53	51	49	47	46	44	43	42	40	39	38	37	36	35	34	33	32	31	30	29	29	28
230	**(104.3)**	**52**	**50**	**48**	**46**	**45**	**43**	**42**	**41**	**39**	**38**	**37**	**36**	**35**	**34**	**33**	**32**	**31**	**30**	**30**	**29**	**28**	**27**
225	(102.1)	50	49	47	45	44	43	41	40	39	37	36	35	34	33	32	31	31	30	29	28	27	27
220	**(99.8)**	**49**	**48**	**46**	**44**	**43**	**42**	**40**	**39**	**38**	**37**	**36**	**34**	**33**	**32**	**32**	**31**	**30**	**29**	**28**	**27**	**27**	**26**
215	(97.5)	48	47	45	43	42	41	39	38	37	36	35	34	33	32	31	30	29	28	28	27	26	25
210	**(95.3)**	**47**	**45**	**44**	**42**	**41**	**40**	**38**	**37**	**36**	**35**	**34**	**33**	**32**	**31**	**30**	**29**	**28**	**28**	**27**	**26**	**26**	**25**
205	(93.0)	46	44	43	41	40	39	37	36	35	34	33	32	31	30	29	29	28	27	26	26	25	24
200	**(90.7)**	**45**	**43**	**42**	**40**	**39**	**38**	**37**	**35**	**34**	**33**	**32**	**31**	**30**	**30**	**29**	**28**	**27**	**26**	**26**	**25**	**24**	**24**
195	(88.5)	44	42	41	39	38	37	36	35	33	32	31	31	30	29	28	27	26	26	25	24	24	23
190	**(86.2)**	**43**	**41**	**40**	**38**	**37**	**36**	**35**	**34**	**33**	**32**	**31**	**30**	**29**	**28**	**27**	**26**	**26**	**25**	**24**	**24**	**23**	**23**
185	(83.9)	41	40	39	37	36	35	34	33	32	31	30	29	28	27	27	26	25	24	24	23	23	22
180	**(81.6)**	**40**	**39**	**38**	**36**	**35**	**34**	**33**	**32**	**31**	**30**	**29**	**28**	**27**	**27**	**26**	**25**	**24**	**24**	**23**	**22**	**22**	**21**
175	(79.4)	39	38	37	35	34	33	32	31	30	29	28	27	27	26	25	24	24	23	22	22	21	21
170	**(77.1)**	**38**	**37**	**36**	**34**	**33**	**32**	**31**	**30**	**29**	**28**	**27**	**27**	**26**	**25**	**24**	**24**	**23**	**22**	**22**	**21**	**21**	**20**
165	(74.8)	37	36	34	33	32	31	30	29	28	27	27	26	25	24	24	23	22	22	21	21	20	20
160	**(72.6)**	**36**	**35**	**33**	**32**	**31**	**30**	**29**	**28**	**27**	**27**	**26**	**25**	**24**	**24**	**23**	**22**	**22**	**21**	**21**	**20**	**19**	**19**
155	(70.3)	35	34	32	31	30	29	28	27	27	26	25	24	24	23	22	22	21	20	20	19	19	18
150	**(68.0)**	**34**	**32**	**31**	**30**	**29**	**28**	**27**	**27**	**26**	**25**	**24**	**23**	**23**	**22**	**22**	**21**	**20**	**20**	**19**	**19**	**18**	**18**
145	(65.8)	33	31	30	29	28	27	27	26	25	24	23	23	22	21	21	20	20	19	19	18	18	17
140	**(63.5)**	**31**	**30**	**29**	**28**	**27**	**26**	**26**	**25**	**24**	**23**	**23**	**22**	**21**	**21**	**20**	**20**	**19**	**18**	**18**	**17**	**17**	**17**
135	(61.2)	30	29	28	27	26	26	25	24	23	22	22	21	21	20	19	19	18	18	17	17	16	16
130	**(59.0)**	**29**	**28**	**27**	**26**	**25**	**25**	**24**	**23**	**22**	**22**	**21**	**20**	**20**	**19**	**19**	**18**	**18**	**17**	**17**	**16**	**16**	**15**
125	(56.7)	28	27	26	25	24	24	23	22	21	21	20	20	19	18	18	17	17	16	16	16	15	15
120	**(54.4)**	**27**	**26**	**25**	**24**	**23**	**23**	**22**	**21**	**21**	**20**	**19**	**19**	**18**	**18**	**17**	**17**	**16**	**16**	**15**	**15**	**15**	**14**
115	(52.2)	26	25	24	23	22	22	21	20	20	19	19	18	17	17	16	16	16	15	15	14	14	14
110	**(49.9)**	**25**	**24**	**23**	**22**	**21**	**21**	**20**	**19**	**19**	**18**	**18**	**17**	**17**	**16**	**16**	**15**	**15**	**15**	**14**	**14**	**13**	**13**
105	(47.6)	24	23	22	21	21	20	19	19	18	17	17	16	16	16	15	15	14	14	13	13	13	12
100	**(45.4)**	**22**	**22**	**21**	**20**	**20**	**19**	**18**	**18**	**17**	**17**	**16**	**16**	**15**	**15**	**14**	**14**	**14**	**13**	**13**	**12**	**12**	**12**
95	(43.1)	21	21	20	19	19	18	17	17	16	16	15	15	14	14	14	13	13	13	12	12	12	11
90	**(40.8)**	**20**	**19**	**19**	**18**	**18**	**17**	**16**	**16**	**15**	**15**	**15**	**14**	**14**	**13**	**13**	**13**	**12**	**12**	**12**	**11**	**11**	**11**
85	(38.6)	19	18	18	17	17	16	16	15	15	14	14	13	13	13	12	12	12	11	11	11	10	10
80	**(36.3)**	**18**	**17**	**17**	**16**	**16**	**15**	**15**	**14**	**14**	**13**	**13**	**13**	**12**	**12**	**11**	**11**	**11**	**11**	**10**	**10**	**10**	**9**

Note: BMI values rounded to the nearest whole number. BMI categories based on CDC (Centers for Disease Control and Prevention) criteria.

www.vertex42.com BMI = Weight[kg] / (Height[m] x Height[m]) = 703 x Weight[lb] / (Height[in] x Height[in])

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