MINISTRY OF HEALTH
REPUBLIC OF SOUTH SUDAN

CONSOLIDATED CLINICAL GUIDELINES ON USE OF ANTIRETROVIRAL DRUGS FOR HIV TREATMENT AND PREVENTION

2014

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FOREWORD

South Sudan is experiencing a generalized HIV epidemic. The limited data available indicates wide variations in HIV prevalence by geographical region ranging from 0.3% in Northern Bar El Ghazal to 6.8% in Western Equatoria. Of the estimated total population of 10.9 million as of 2012, about 2.7% of adults aged 15-49 years are infected with HIV. Approximately 152,000 people are living with HIV; 13% of these are children under 15 years of age. The number of new HIV infections occurring annually is estimated at 15,000; majority of these acquired through heterosexual transmission. The estimated number of deaths due to HIV is 13,000 annually.

Nationally, there has been continued scale-up of HIV/AIDS interventions with support from various development partners. Currently there are 114 sites providing HIV testing and counseling, with 75 sites providing Prevention of Mother to Child Transmission services, and 22 sites providing antiretroviral treatment. The South Sudan National HIV/AIDS Strategic Plan (NSP) 2013-2017 is aimed towards achievement of universal access to HIV prevention, treatment and care by 2017 with the overall impact of reducing new HIV infections, and mortality among PLHIV by 50%. This will be achieved through increasing HIV testing and ART coverage among adults, children, pregnant and breastfeeding women from below 10% to 80%, improving retention of PLHIV in care and treatment from 71% to 83%, and improving livelihood support for PLHIVs.

The NSP is aligned to the third pillar of the South Sudan Development Plan (SSDP): 'Social & Human Development with one of the health objectives being "To increase equitably the utilization of quality basic health and HIV/AIDS services". As a signatory to the 2011 UN General Assembly political declaration on HIV/AIDS, South Sudan has committed itself to accelerating the HIV/AIDS response to achieve the set targets of reducing HIV sexual transmission by 50% by 2015; eliminating new infections among children and keeping mothers alive; reaching 15 million people with ART; and reducing TB deaths in PLHIV by 50%.

The national ART guidelines have been revised to provide health care workers with an up-to-date guide for the use of antiretroviral therapy in all population groups including adults, children, and pregnant women. These guidelines have been developed by the Directorate of HIV/AIDS in the MOH with technical and financial support from World Health Organization (WHO) and other partners. It is hoped the guidelines will contribute towards provision of quality HIV care in the Republic of South Sudan.

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The development of these consolidated antiretroviral guidelines for South Sudan was made possible through a consultative and consensus building process in which all stakeholders and development partners were actively involved.

Therefore, on behalf of the Ministry of Health, Republic of South Sudan (MOH-RSS), I would like to take this opportunity and thank all individuals, international NGOs and UN agencies that contributed financially and technically for the development of the guidelines. See list of contributors Table 13-5

The Ministry of Health acknowledges and thanks the South Sudan HIV/AIDS Commission (SSAC) for taking an early lead in coordinating the process of development of this document. Likewise, special thanks go to World Health Organization (WHO), South Sudan for providing the technical support necessary for completion of the guidelines.

I would also like to recognize and acknowledge the contribution of Dr. Pinyi Nyimol Upur, the Director General for Preventive Health Services, MOH-RSS; Dr. Emmanuel Lino, Acting Director, Department of HIV/AIDS/STIs for their technical and constructive inputs and for coordinating the development process of this guideline.

Finally, it is important to note that the Ministry urges all partners to familiarize themselves with the content of these guidelines and use it accordingly in providing treatment, care and support to people living with HIV and AIDS in South Sudan. This will further ensure optimal therapy, good clinical outcomes, effective care, and better outlook for the clients.

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ACRONYMS AND ABBREVIATIONS

3TC	Lamivudine
AAFB	Alcohol acid fast bacilli
ABC	Abacavir
AIDS	Acquired Immune deficiency Syndrome
ANC	Antenatal care
ART	Antiretroviral Therapy
ARVs	Antiretroviral Drugs
ATV	Atazanavir
AZT	Zidovudine
BCG	Bacille Calmette Guerin (vaccine for TB)
BF	Breastfeeding
BMI	Body Mass Index
CD4	CD4+ T cell (T lymphocyte bearing CD4 receptor)
CDR	Case Detection Rate (for TB)
CO	Clinical Officer
CPT	Cotrimoxazole Preventive Therapy
CSF	Cerebrospinal fluid
CTX	Cotrimoxazole
CXR	Chest X Ray
D4T	stavudine
DBS	Dried Blood Spot
ddI	Didanosine
dl	decilitre
DNA-PCR	Deoxyribonucleic acid polymerase chain reaction (for EID)
DOTS	Directly Observed Treatment Short Course (for TB)
EHRZ	Anti-TB regimen: Ethambutol, Isoniazid, Rifampicin, Pyrazinamide
EFV	Efavirenz
EIA	Enzyme immune assay
EID	Early Infant Diagnosis (of HIV)
ELISA	Enzyme Linked Immuno Sorbent Assay
eMTCT	elimination of Mother To Child Transmission (of HIV)
EPI	Expanded Program for Immunization
EPTB	Extra-pulmonary tuberculosis
FDC	Fixed Dose Combination
FP	Family Planning
FTC	Emtricitabine
GOSS	Government of South Sudan
HAART	Highly active Antiretroviral Therapy
HB	Hemoglobin
HBC	Home Based Care
HBV	Hepatitis B Virus
HCT	HIV Counseling and Testing
HCV	Hepatitis C Virus
HEI	HIV-Exposed Infants
HIV	Human immunodeficiency virus
HIVDR	HIV Drug Resistance
HSV	Herpes Simplex Virus
HTC	HIV testing and counseling
IC	Infection Control (for TB)
ICF	Intensified Case Finding
IM	Intramuscular
INH	Isoniazid
IPT	Isoniazid Preventive Treatment
IRIS	Immune Reconstitution Inflammatory Syndrome
ITN	Insecticide Treated (mosquito bed) Net
IV	Intravenous
KS	Kaposi sarcoma
LFTs	Liver Function Tests
LPV/r	Lopinavir /ritonavir
LTFU	Lost to Follow Up
MARPs	Most At Risk Populations (for HIV)
M&E	Monitoring and Evaluation
MCH	Maternal and child health
MDR-TB	Multiple Drug Resistant tuberculosis

MTCT	Mother to child transmission (of HIV)
NFV	Nelfinavir
NNRTIs	Non-Nucleoside Reverse Transcriptase Inhibitors
NRTIs	Nucleoside Reverse Transcriptase Inhibitors
NSP	National Strategic Plan (for HIV/AIDS)
NVP	Nevirapine
OI	Opportunistic Infection
ORS	Oral Rehydration Solution
PC	Palliative Care
PCP	Pneumocystis Carinii (jiroveci) Pneumonia
PCR	Polymerase Chain Reaction
PEP	Post-Exposure Prophylaxis
PGL	Persistent Generalized Lymphadenopathy
PHDP	Positive Health Dignity and Prevention (also PwP)
PI	Protease Inhibitor
PITC	Provider Initiated HIV Testing & Counseling
PLHIV	People Living with HIV/AIDS
PML	Progressive multi focal Leucoencephalopathy
PMTCT	Prevention of Mother to Child Transmission
POC	Point of Care (technology)
PreP	Pre-exposure Prophylaxis
PTB	Pulmonary tuberculosis
PwP	Prevention with Positives (also PHDP)
PNC	Postnatal Care
RH	Reproductive Health
RSS	Republic of South Sudan
RTV	Ritonavir (as PI pharmacoenhancer)
SCM	Supply Chain Management
SGBV	Sexual & Gender Based Violence
sdNVP	single dose nevirapine
SOP	Standard Operating Procedure
SQV	saquinavir
SRH	Sexual and Reproductive Health
STD	Sexually Transmitted Disease
STI	Sexually Transmitted Infection
TEN	Toxic Epidermal Necrolysis
TDF	Tenofovir (Disoproxil Fumarate)
TB	Tuberculosis
TSR	Treatment Success Rate (for TB)
VCT	Voluntary Counseling and Testing
VIA	Visual inspection(of cervix)with acetic acid
VL	Viral Load
VMMC	Voluntary Medical Male Circumcision
WBC	White Blood Cells
WHO	World Health Organization
ZDV	Zidovudine (or AZT)

1 INTRODUCTION

1.1 BACKGROUND AND CONTEXT

The first national guidelines for the use of antiretroviral drugs in South Sudan were launched in 2008. At that time, the CD4 threshold for antiretroviral therapy (ART) initiation in adults was 200 cells/mm^3, and for pregnant women not eligible for ART, a short course of ARV prophylaxis during pregnancy until shortly after delivery (option A) was recommended. In 2012, an addendum to these guidelines expanded ART eligibility to include all adult People Living with HIV (PLHIV) with CD4 below 350 cells/mm^3. By December 2013, there were 22 accredited ART sites nationally. Of the 16,000 clients enrolled into HIV care and treatment services, just over 6,899 were on ART, representing 9% of the estimated number in need. Children below 14 years of age contributed only 2% of persons on ART.

In June 2013, the World Health Organization (WHO) released new recommendations on the use of ARV drugs for the treatment and prevention of HIV infection. The recommendations were aimed at increasing equitable access to quality ART and reducing HIV transmission. The 'consolidated' guidance on clinical HIV care and prevention addresses all the various population groups (adults, adolescents, children and pregnant women), in different clinical care settings including tuberculosis (TB) clinics, Mother & Child Health (MCH) clinics, ART clinics, and HIV testing sites.

These recommendations provide an opportunity for improved quality of life for PLHIV and reduction in new HIV infections and have prompted revision of the South Sudan HIV treatment guidelines.

- These revised guidelines recommend earlier HIV treatment and raise the threshold for starting ART from a CD4 of 350 cells/mm^3 to 500 cells/mm^3 because of the evidence that earlier treatment prolongs life and results in fewer HIV transmissions from an infected person to an uninfected person.
- These guidelines also recommend that all pregnant and breast feeding women start ART at any CD4 count and continue lifelong ART (Option B+) to reduce risk of HIV transmission to the infant, promote HIV-free survival for the HIV-exposed infant, and improve the health of the mother.
- All children under 5 years of age should start ART as soon as HIV is diagnosed regardless of clinical stage or CD4 cell count.
- Individuals co-infected with HIV and active TB should initiate ART regardless of clinical stage or CD4.
- Individuals co-infected with HIV and Hepatitis B virus (HBV) who require treatment for their HBV should be initiated on ART regardless of CD4, using a TDF+FTC (or 3TC) based regimen.
- HIV-infected partners in sero-discordant relationships irrespective of clinical stage or CD4 count should be offered ART to reduce the risk of HIV transmission to the negative partner.
- These guidelines recommend a preferred first-line, a fixed dose combination of three ARV drugs in a single pill for the treatment of HIV infection in adults and adolescents. This regimen of *tenofovir + lamivudine (or emtricitabine) + efavirenz* (TDF+3TC (or FTC) +EFV) was selected because it is simple, and less toxic. Fixed dose combination dispersible tablet formulations are recommended for treating HIV in children for ease of administration and improved adherence.

Implementation of these recommendations is supported by the national scale-up plan that is aimed at achieving universal access by 2017. The guidelines support expansion of HIV testing and counselling (HTC) especially through provider-initiated testing and counselling (PITC) and early infant diagnosis (EID), further decentralizing ART to match PMTCT and TB care delivery, adoption of task shifting to alleviate the human resource gaps, and strengthening the supply chain management and M&E systems to support services scale-up.

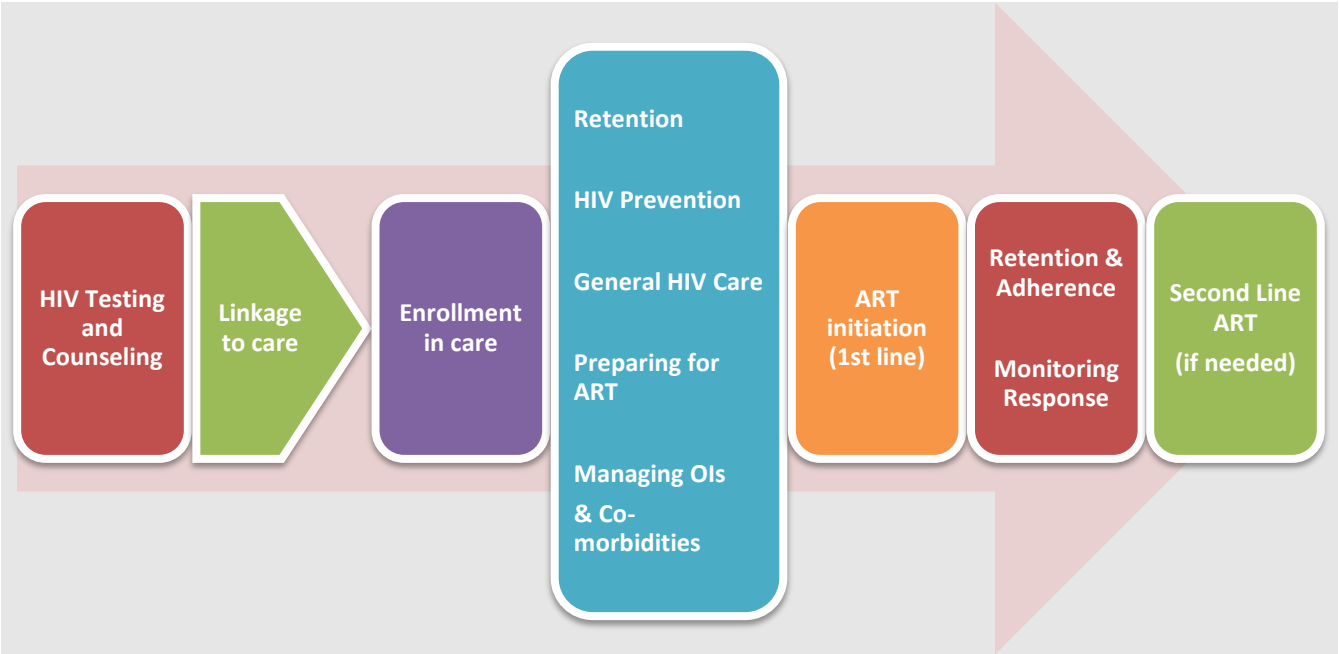
1.2 RATIONALE FOR REVISED AND CONSOLIDATED GUIDELINES

The guidelines have been developed to standardize management of HIV in different population and age groups and clinical care settings using an integrated approach, and emphasize the fact that HIV treatment and prevention should be offered in a comprehensive continuum of care setting as shown in Figure 1-1. Previously, there was separate guidance based on population group or HIV intervention.

In addition, the revised guidelines contribute to the National HIV/AIDS Strategic Plan goal of universal access to ART by 2017.

'Continuum of care' refers to a comprehensive package of HIV prevention, diagnostic, treatment and support services provided for PLHIV and their families ranging across initial HIV diagnosis and linkage to care, management of opportunistic infections, initiating, maintaining and monitoring antiretroviral therapy, and palliative care.

Figure 1-1: Continuum of HIV care



1.3 OBJECTIVES OF THE GUIDELINES

The objectives of consolidated guidelines are:

- To provide a standardized and simplified guide for the use of antiretroviral drugs in the comprehensive HIV/AIDS service delivery setting.
- Ensure timely initiation of ARVs for HIV treatment and prevention
- Improve clinical outcomes, promote adherence and improved retention of clients in care
- Strengthen health systems to support service delivery in the continuum of care
- To serve as a training tool and reference material for health service providers, program managers, researchers, and people living with HIV.

Specific national program objectives include:

1. To scale-up PITC and other HTC approaches with linkage to care
2. To initiate ART for all eligible adults and children (for prevention & treatment) including pregnant and breastfeeding women
3. Decentralize and scale –up services with capacity building for ART and accreditation of additional health facilities to initiate ART, manage, monitor and refer clients
4. Strengthen capacity of health care workers for services delivery; develop a national policy to address task shifting; recruit additional staff; and enhance staff retention
5. Strengthen supply chain management to support scale-up of all HIV interventions, phase out D4T and phase in use of *tenofovir* and *abacavir*-based FDCs for adults & adolescents and children, respectively
6. Strengthen program monitoring and evaluation
7. Roll-out early infant diagnosis testing services, and use of viral load- for diagnosis of treatment failure
8. Strengthen linkages and integrate services for all population groups, and clinical care settings

1.4 TARGET AUDIENCE

These guidelines are targeted to reach the following audiences:

- Clinicians and other health service providers
- Program managers of the national and state HIV program, the TB program, laboratory services, MNCH and reproductive health programs, commodity supply chain management for HIV related commodities
- Health facility administrators
- Training Institutions and Researchers
- Development partner agencies that support the national program and those that work with civil society

1.5 SCOPE AND COMPONENTS OF THE GUIDELINES

The guidelines include several chapters:

- Chapter 1 describes the background, rationale, objectives of the guidelines and the target audience
- Chapter 2 covers *HIV Counseling and Testing (HTC),* a key strategic entry point to prevention, treatment, care and support services.
- Chapter 3 looks at *Chronic HIV care* which enables early ART eligibility assessment and timely initiation of treatment, as well as access to interventions aimed at preventing further HIV transmission, and prevention of opportunistic infections and co-morbidities.
- Chapter 4 covers Antiretroviral *Therapy,* the goal of which is to suppress viral replication, reduce CD4 cell destruction, restore the immune system thereby reducing HIV-related illness and improving quality of life.
- Chapter 5 looks at the needs of adolescents living HIV
- Chapter 6 outlines *Prevention of Mother to Child HIV transmission, a* central component in the continuum of care for women living with HIV to reduce the burden of HIV in the paediatric population.
- Chapter 7 & Chapter 8 look at *HIV infection in children* which tends to follow a more aggressive course than in adults. Children are therefore given a special section highlighting some of the unique features of care in this population. Recommendations on *Infant and Young Child Feeding* are covered in Chapter 8.
- Chapter 9 highlights *TB and HIV* co-management since TB is a common cause of illness among PLHIV.
- Chapter 10 outlines recommendations on *Prevention of new HIV infections using ARV drugs.* Prevention remains the cornerstone in HIV control in the absence of a cure.
- Chapter 11 and Chapter 12 highlight health systems to support HIV services delivery including *Laboratory support* (Chapter 10), *Monitoring and Evaluation, Supply Chain Management and Human Resource* in Chapter 12.

Table 1-1: Integrated Provision and Scheduling of Clinical HIV Services

	Section	Schedule	Pre-ART clinic	ART clinic	TB clinic	Family Planning	ANC	Maternity	Post - natal	Under 5/ young child	OPD	In-patient
PITC	2.4	Ascertain current HIV status at each visit offer HCT to eligible clients in all settings	√	√	√	√	√	√	√	√	√	√
WHO clinical staging	3.2	At HIV diagnosis, enrollment in care, every 3/12 in care, at ART initiation	√	√	√	√	√	√	√	√	√	√
Management of HIV related disease	3.5	When diagnosed, and throughout the course of care	√	√	√		√	√	√		√	√
Clinical Monitoring HIV disease	3.1	At every visit	√	√	√	√	√	√	√	√	√	√
CD4 monitoring	3.3	6 monthly - in pre-ART and while on ART	√	√			√	√	√			
Provider-Initiated Family Planning	6.2.2	At every scheduled visit	√	√		√			√			
Prevention with Positives	3.7	At every visit	√	√	√	√	√	√	√			
Pregnancy status		At every visit – for women of child- bearing age	√	√	√	√					√	√
Cotrimoxazole Preventive Therapy	3.6	At every scheduled visit	√	√	√		√	√	√	√	√	√
Insecticide treated bed net (ITNs)	3.5.1	Dispense one ITN per person living with HIV every 24 months	√	√			√		√	√		
Infant and child feeding counseling	8	At every visit					√	√	√	√	√	
Starting ART	4.2	Within 7 days of being found eligible for ART		√	√		√	√	√	√		√
ART follow-up	4.5	At 2/52, monthly for 6/12, then 3 monthly. For PMTCT, see monthly for 3/12 then quarterly. For TB, see monthly.		√	√		√					
Management of labour & delivery	6.4	At admission						√				
Newborn, post-natal care	6.4	After delivery						√	√			
Infant ARVs prophylaxis	6.4.2	At birth (may dispense NVP in ANC) and during the first 6 weeks post -partum.						√	√			
Mother infant follow-up for HIV-exposed infant	6.5	Monthly for the 1st 3 months i.e. 6, 10, and14 weeks (as per immunisation schedule). Thereafter, see quarterly for healthy infants. For infants that are Ab seropositive at 9 months, see monthly till HIV is excluded.					√	√	√	√		
Post exposure prophylaxis	10.3	As soon as possible after risk exposure						√			√	

2 HIV TESTING AND COUNSELING (HTC)

HIV testing and counseling (HTC) is a key strategic entry point to prevention, treatment, care and support services. The goal of HTC is to identify as many people as possible with HIV early in their infection and link them successfully to prevention, treatment, care and support services and to link those who test negative to HIV prevention services.

Key messages & recommendations:

- HIV testing and counseling (HTC) is provided through two approaches: client initiated testing and conseling (CITC), provider initiated testing and counselling (PITC), using either the facility-based model (at health facilities, stand-alone sites), or community-based models in different settings such as Home-based door-to-door including index clients, mobile and outreach, work-place, educational institutions, campaigns, and self-testing.

- Regardless of the approach or model, HTC must be voluntary and adhere to the five 'Cs'— Consent, Confidentiality, Counselling, Correct test results and linkage to Care

- Provider Initiated Testing and Counseling (PITC) is recommended for:
  - All clients accessing health care services and their partners, regardless of whether they demonstrate signs and symptoms of HIV infection
  - Partners and children of people living with HIV (PLHIV)
  - Key populations at high risk for HIV infection
  - All clients seen during mobile and outreach HTC
  - Men seeking Voluntary Medical Male Circumcision (VMMC)

- Components of the PITC protocol include:
  - Pre-test information (through group education or one-on-one interaction)
  - HIV testing
  - Post-test counseling
  - Linkages to prevention, treatment, care, and support services

- Enroll all adults and children with confirmed HIV infection into care and treatment to ensure they can start ART as soon as they are eligible

2.1 PRINCIPLES OF HTC

- Persons receiving HIV testing and counseling (HTC) must give informed **Consent** to be tested and counselled. Clients should freely decide whether to accept the test (opt-in), or decline (opt-out).
- HTC services are **Confidential:** what the HTC provider and the client discuss will not be disclosed to anyone else without the expressed consent of the person being tested.
- HTC services must be accompanied by appropriate pre-test information and post-test **Counseling**
- HTC providers should strive to provide high-quality testing services, and ensure the provision of **Correct** test results.
- HTC should provide **Connections** (linkages) to prevention, care, and treatment services.

2.2 HTC Approaches and Models

HTC is provided through two major approaches, Client initiated Testing and Counseling (CITC), and Provider initiated testing and Counseling (PITC). To increase access to HIV diagnosis, all HTC approaches should be implemented in South Sudan, with priority given to PITC, targeted outreach HTC, and HIV testing for Early Infant Diagnosis.

2.2.1 Client-Initiated HIV Testing and Counseling (CITC):

- Also referred to as Voluntary Counseling and Testing (VCT), involves individuals actively seeking HTC from a facility that offers the service.

2.2.2 Provider-Initiated Testing and Counseling (PITC):

- PITC refers to HIV testing and counseling that is recommended by health care providers to persons attending health care facilities as a standard component of medical care.
- PITC aims to identify unrecognized or unsuspected HIV-infected persons and link them to prevention, treatment, care and support services.
- PITC should be prioritized in higher HIV burden settings (e.g. in-patient wards, TB clinics, malnutrition wards, and populations.
- Partners and children of PLHIV should also be offered testing. Providing HTC to family members of HIV clients (after consent and/or disclosure of the HIV client) improves support for adherence to ART and other care interventions.

Couples' HIV testing and Counseling:

Couple HTC enhances safer sexual behaviour, increases services uptake and treatment adherence, and identifies couples that would benefit from ART for prevention of HIV transmission (the sero-discordant couples) or ART for their own health (sero-concordant positive). Both partners must consent to testing and agree to learn the results together.

- Couple HTC (with support for mutual disclosure) should be offered in all HTC settings (including ANC) to married and co-habiting couples, premarital couples, polygamous unions, and any other partnerships.
- All PLHIV should be supported to encourage partner testing and disclosure of HIV status.
- HIV-positive partners in a sero-discordant relationship should be offered ART.
- Reproductive health counseling should be provided to couples of child bearing age.

- PITC models include:
    - Facility-based HCT (at health facilities, stand-alone sites)
    - Community-based HCT including Home-based door-to-door, mobile and outreach, work-place, educational institutions, campaigns.

2.2.2.1 Facility Based HTC Models

Health care facility-based HTC services: (also see Table 2.1)

- HTC services should be provided with other services being offered in health care facilities in the public, private and non-governmental sectors.
- *PITC* services should be provided to all adults, adolescents and children attending all health facilities as the recommended "standard of care". Settings for HTC service provision include antenatal care (ANC), tuberculosis (TB), sexually transmitted infection (STI) and out-patient clinics; medical and surgical wards; maternal, newborn and child health (MNCH) services; reproductive health and male circumcision services (where available).
- With diagnostic HTC**,** the health care providers offer HTC to individuals who show signs or symptoms consistent with HIV-related disease or AIDS.
- Mandatory and compulsory HIV testing can be performed for specific reasons such as tissue donation and medico legal circumstances such as rape and defilement. However, individuals should be informed of test results, and testing should be accompanied by appropriate counseling. Mandatory screening for HIV of blood and blood products destined for transfusion targets blood products and not the person donating blood. It should not be considered as an appropriate means for knowing one's HIV status.

Stand-alone HTC services:

- May be provided at sites that are situated outside health care facilities. Additional HIV prevention, treatment, care and support services can also be provided from these sites.

Table 2-1: Advantages and key considerations for facility-based HTC

Model	HTC Approach	Target group	Advantages	Key Considerations
Health care facility-based	**PITC**	People seeking health services	• HTC is integrated into existing services • Reduces missed opportunities to identify HIV positive persons • Links HIV positive persons to prevention, treatment, care and support services • Cost effective, efficient and less expensive • Low stigmatization as people could be attending the facility for other services • Close links with other existing medical services • Can provide outreach services	• Counselling space could be a challenge • Work overload for existing staff • Not ideal for people who do not frequent health services e.g. men, adolescents, and youths • Clinic operating hours may limit or affect access to HTC services
Stand-alone HTC site	**CITC**	General population including those that do not frequent health care facilities	• Convenient to those who do not want to be seen visiting public health care facilities • Accessible to key populations • Can be located in busy, easily accessible locations • Staff are dedicated to full time HTC service provision • Anonymous and confidential HIV testing is offered • Flexible operating hours • Can provide outreach services	• Attracts the more motivated clients • Poor referral mechanisms for follow up care and support • High likelihood of staff burnout • Possibility of stigmatization of the site • Expensive to maintain and sustain services as they are usually donor-funded • Could be underutilized if services are not advertised

2.2.2.2 Community Based HTC models:

Community-based HTC (CBHTC) contributes to reduction in stigma and discrimination by removing social barriers to HTC. Through increased knowledge of HIV status, more people can access prevention, treatment, care and support services. CBHTC is more likely to reach first-time testers, PLHIV with higher CD4 cell counts, men, adolescents, discordant couples, and key populations. Different settings can be used to provide CBHTC as follows: Home-based, including index client; Mobile and Outreach; Workplace; HTC in Educational institutions; and Campaigns.

Home based HTC including index clients :

- Should be provided using the door-to-door approach. It facilitates access to hard-to-reach, rural and underserved populations. Known HIV-positive or TB clients can act as index clients and consent to provision of HTC services in their homes.

Workplace HTC services:

- Usually provided as part of comprehensive workplace HIV programs. Reaches both men and women in formal and informal employment through their workplaces. Services can be provided either as a static service or as an outreach from facilities providing HTC services. Men who do not want or do not have time to access public health facilities for HTC can benefit from this model.

Outreach & Mobile HTC:

- Should be provided from health facilities and stand-alone sites. Mobile teams can provide outreach HTC services in such premises as community halls, school halls, and youth facilities. They target the general population, people living in remote rural areas, and key populations who include those at high risk of acquiring HIV (e.g. sex workers) and vulnerable groups (e.g. prisoners and highly mobile populations such as long distance truck drivers). It is essential to establish strong support systems and referral mechanisms at community level before initiating outreach HTC.

Educational institutions:

- Improves access to HTC for students in educational institutions. Issues concerning informed and parental consent, confidentiality, peer pressure, linkages and follow-up need to be addressed before setting up services. This model contributes to normalization of HTC and early access to knowledge of one's HIV status.

Campaigns:

- HTC campaigns can take different forms including service provision through mobile or outreach services, creating awareness and directing clients to service provision sites, and as part of disease prevention campaigns e.g. malaria Campaigns can vary in duration and can target specific populations such as couples or youths.

HIV self-testing (HIVST):

- This option allows one to choose where and when to have the HIV test without worrying about confidentiality. Can be performed using oral fluid rapid diagnostic tests. HIVST is not currently recommended due to concerns with regard to test accuracy, results' interpretation, lack of counseling, and links to follow-up services following a positive HIV test result.

Table 2-3 gives a summary of the advantages of community-based HTC services.

Table 2-2: Advantages of Community-based HTC services

Model	HTC *Approach*	Target group	Advantages
Home based including index	**PITC and CITC**	• Hard to reach • Underserved • Rural • Index	• Families test together • Early identification of infected children • Cost-effective • Increases HTC uptake • Reduces inequities • Increases number of first-time testers • Early identification of HIV-infected people • Early identification of sero-discordant couples
Mobile and Outreach	**PITC**	• Rural populations • Marginalised populations • Populations underserved by formal health system • Key populations	• Can be offered in different settings e.g. churches, educational institutions, workplaces, at events • Normalises HIV testing • Reduces financial costs to the client • Moonlighting services can be provided at times and locations that are convenient to some clients including key populations e.g.at night for sex workers and their clients
Workplace	**PITC and CITC**	• Employees and their families	• Able to reach men who find it difficult to get time to go to health facilities • Able to provide HTC to employees' families • Convenient for both employers and employees • Employers can have HTC services in the company clinic
Educational institutions	**PITC and CITC**	• Students and teachers	• Normalizes HIV testing thus reducing stigma • Early identification of HIV-infected children, adolescents and young adults • Early linkages to prevention, treatment, care and support services • Access to information on HIV prevention
Campaigns	**PITC and CITC**	• General population • Selected, targeted populations	• Mobilises communities to support HTC thus normalizing HIV testing • Increases HTC uptake • Can target specific groups • Can be linked to specific events
Self-testing	**CITC**	• General population • Health workers • Key populations	• Autonomy and empowerment • Confidentiality • Convenient • Increased knowledge of HIV status • Less stigma around HIV testing • Fewer resource requirements from the health system

2.3 HTC IN SPECIFIC POPULATIONS

2.3.1 HTC in infants and children below 18 months

- PITC should be implemented in all infant care settings to identify HIV-exposed infants (HIE) and ensure prompt linkage of HIV-infected infants to ART.
- All infants with unknown HIV status or uncertain HIV exposure should have their HIV exposure status ascertained using maternal or infant serological antibody (Ab) test.
- Routinely ascertain the mother's HIV status regardless of whether the child is healthy or sick by reviewing the mother's health passport or ante-natal care (ANC) card for the latest HIV test result.
- Initiate a new HIV rapid test*:*
    - For the mother: If she was not tested at least twice during pregnancy and delivery, tested HIV negative more than 3 months prior, or if mother's HIV status is unknown or unclear.
    - For the child, *if* the mother is unavailable/has died /doesn't consent to maternal HTC.
    - If the child is sick, even if the mother tested negative during pregnancy or delivery. This is to rule out new HIV infection in the child.
- A negative antibody test in the infant means the infant or child is not exposed to HIV.
- If the infant is HIV-exposed (i.e. infant and/or mother is Ab positive), then confirm HIV infection using virological testing such as DNA PCR if available. PCR can be used to diagnose HIV in majority of infected infants by 4 weeks of age.
- Samples for PCR testing can be whole blood or dried blood spots (DBS) on filter paper cards that must be transported to reference laboratories. Capacity for PCR testing in South Sudan is yet to be fully established.

Where virologic testing is readily available;

- *A*ll HIV- exposed infants should be tested within 4 to 6 weeks of birth or at the earliest opportunity thereafter.
- If the DNA PCR test is positive, the infant is likely to be infected and should be initiated on ART immediately while a second blood specimen is collected for confirmatory testing.
- If the DNA PCR test is negative and the child is still breastfeeding or has breastfed in the 6 weeks before testing, the test result is not definitive and the child should be re-tested 6 weeks after breastfeeding has ended: – using DNA PCR if younger than 18 months, or an Ab test if older.

*Where **virologic testing is not readily available**:*

- HIV-exposed infants should have serological Ab testing, regular clinical monitoring, and CPT.
- Infants with a presumptive diagnosis of HIV (Table 2-4) should be managed as follows; treat the acute illness; initiate ART; repeat Ab test after 18 months of age; continue ART if Ab positive; stop ART only if Ab test is negative after 18 months and the child is no longer exposed to HIV (through breastfeeding from an infected mother). Where available, exclude HIV using DNA-PCR at an earlier age.
- HIV-exposed infants who are 'well' (asymptomatic) should have an Ab test at 9 months of age or 6 weeks after cessation of breast-feeding and start ART if HIV positive. ART should be stopped if HIV is excluded (by Ab testing after 18 months, or DNA-PCR if younger) See algorithm in Figure 2-2 & Table 2-1

Table 2-3: Criteria for Presumptive diagnosis of severe HIV disease in infants below 18 months

<table>
<tr><th colspan="2">A presumptive diagnosis of severe HIV disease should be made if:</th></tr>
<tr><td>The child is confirmed as being HIV antibody positive

AND</td><td>The infant is symptomatic with two or more of the following:
Oral thrush
Severe pneumonia
Sever sepsis
OR
A diagnosis of any AIDS-indicator conditions(s) can be made</td></tr>
<tr><td colspan="2">Other findings that support the diagnosis of severe HIV disease in an HIV seropositive infant include:
Recent HIV-related maternal death or advanced HIV in mother
Child's %CD4 is <20%</td></tr>
<tr><th colspan="2">Confirm the diagnosis of HIV infection as soon as possible.</th></tr>
<tr><td colspan="2">AIDS indicator conditions include some but not all HIV pediatric clinical stage 4 conditions such as pnemocystis carinii(jiroveci) pneumonia, cryptococcal meningitis, severe wasting, or severe malnutrition, Kaposi' sarcoma, extra-pulmonary TB

As per IMCI definition:
Oral thrush: creamy white –to –yellow soft small plaques on red or normally colored mucosa which can be scraped off (pseudomembranous) or red patches on the tongue, palate or lining of mouth, usually painful or tender.
Severe pneumonia: cough or difficult breathing in a child with chest pain with chest in-drawing, stridor, or any of the IMCI general danger signs i.e. lethargic or unconscious, not able to drink or breastfeed, vomiting and presence or history of convulsions during current illness; responding to antibiotics
Severe sepsis: Fever or low body temperature in young infant with any sever sign, e.g. fast breathing, chest in-drawing, bulging fontanelle, lethargy, reduced movement, not feeding or sucking breast milk, convulsions.</td></tr>
</table>

Table 2-4: Recommended Testing Approaches for Infants and Children below 18 months

Category	Test required	Purpose	Action
A. Infant with unknown exposure status	Maternal serological Ab test or infant Ab test	To identify /confirm exposure	If HIV-exposed, do virological test (where available). Enrol all HIV-exposed infants in monthly care and provide CPT
B. HIV-exposed infant who is <u>well.</u>	Virologic testing (EID test) at 4-6 weeks of age *<u>or earliest opportunity thereafter</u>*.	To diagnose HIV	Start ART if HIV-infected.
	If virologic test is not available, perform Ab test at 9months of age or sooner if maternal HIV status unknown.	To confirm HIV exposure	• *If HIV Ab positive at 9 months of age, continue CPT, initiate ART, repeat Ab test after 18 months, stop ART if Ab negative.* • *If symptoms develop during follow-up, see category C below.* • *If HIV Ab negative, assume uninfected. If still breastfeeding, continue follow-up and CPT, and repeat testing 6/52 after cessation of breastfeeding or after 18 months. If negative stop CPT. If positive start ART.*
C. HIV-exposed infant who is unwell/ sick	HIV serological test.	To confirm HIV exposure	If Ab positive, send sample for virologic testing to confirm HIV (where available). If symptomatic with two or more of the following; oral candidiasis/thrush, severe pneumonia, severe sepsis or has a diagnosis of any AIDS-indicator condition(s), presume infant is HIV- infected, treat acute illness, start ART, confirm HIV with virologic test (if available) or Ab test after 18 months. Stop ART if confirmed negative.
D. Infant or child who has completely discontinued breast feeding	If 6 weeks or more after breast feeding, do Ab test followed by virological testing for HIV positive child < 18months	To exclude HIV infection after exposure	Infected infants and children <5 years need to start HIV care and ART

2.3.2 Counseling children and youth:

Children and youth have unique vulnerability to HIV infection, and as their ability to comprehend HIV/AIDS issues differs from that of adults, this population deserves special consideration. The welfare of the child should be the paramount guiding principle when considering testing; the counselor should determine reasons for testing with the parent or guardian.

- Anyone 18 years of age and above requesting HTC should be considered able to give full, informed consent.
- Young people under age 18 years of age who are married, pregnant, parents, engaged in behaviour which puts them at risk, or are child sex workers are considered capable of giving their own consent for HTC, and do not need a parent or guardian's consent.
- HTC of those who are under 18 years and do not have the above mentioned risk factors, should be done with knowledge and consent of a parent or guardian. Verbal consent is sufficient.
- For those under 18 years of age who have no parents or guardians, parental/guardian consent will not be required before testing is done but the young person will be asked to sign a declaration that they have no parents or guardians. HTC services will be provided in consultation with social services' providers or institutional heads.
- Giving information about the HIV status of a child should be done only if necessary in the interest of the child with his parents'/guardian's consent; and only to trustworthy teachers who have received training in HIV counseling.
- Adolescents should be disclosed to at the time of HIV testing as their understanding of the HIV test results is critical for successful linkage and retention in care and treatment services
- HTC counselors should be trained on a child developmental approach to gradual disclosure of HIV status for younger children. Young children should be told their status incrementally to accommodate their cognitive skills and emotional maturity, in preparation for full disclosure.
- For additional detail on psychosocial support needs of adolescents, refer to section 5. Further guidance on HIV disclosure counseling for children younger than 10 years can be found at: *http://www.who.int/hiv/pub/hiv_disclosure/en/*.

2.3.3 HTC for male circumcision:

- HTC is part of the minimum service package for Voluntary Medical Male Circumcision (VMMC), thus providing an opportunity to reach men with HIV prevention and care services.
- VMMC may be implemented using a mixed-service delivery model including fixed-facility sites, outreach, mobile services and campaign events.
- South Sudan will be rolling out VMMC starting with the military.

2.4 THE PITC PROTOCOL

Recommendation:
PITC should be offered to everyone (adults, adolescents, and children) attending all health facilities; including medical and surgical services; STI, TB clinics, public and private facilities, in-patients and out clients settings, mobile and outreach, services for pregnant women (ANC, FP, MCNH settings); services for key populations; services for infants and children; and Reproductive Health services.

A. Pre-test information:

- Can be provided as group education (an interactive health education session to groups of waiting clients and facilitated by peer educator, nurse or counsellor) or as a one-on-one session between provider and client.
- Gives information on benefits of HTC; confidentiality and interpretation of test results; HIV transmission, prevention, and treatment; partner HIV testing and disclosure
- Information, Education, and Communication (IEC) materials such as posters and brochures may supplement group education
- Routinely ascertain HIV status of clients, initiate new test if status is unknown or unclear.
- Reinforce education messages, encourage testing, and seek consent for HIV testing (verbal consent is sufficient). Always remind clients that they have a right to decline testing.

B. ***HIV testing:*** - See testing algorithms for adults and children in Figure 2-1 and Figure 2-2 .

C. Post-test counseling:

Clearly communicate the meaning of the HIV test results to the client. Couples should be encouraged to receive results together.

For the HIV-negative client:

- Focus on risk reduction interventions
- Persons who require re-testing include those whose initial test results were indeterminate, those who tested negative but are at an on-going risk for acquiring HIV (uninfected partners in sero-discordant relationships, pregnant women, 'key' populations, sero-negative individuals taking Pre- or Post-exposure Prophylaxis), and those who may be in the early stages of infection and have not yet developed a sufficient level of antibodies that can be detected by serological testing ('window period'). Window period – the period of time from when a person is suspected to have been infected with HIV to when HIV antibodies can be detected by a given assay.
- If male and HIV negative, counsel and refer for male circumcision (VMMC) services

For the HIV positive client:

- Focus on encouraging acceptance of HIV diagnosis; partner testing and disclosure; assessing and resolving barriers to accessing care.
- Refer to HIV care site for enrollment into pre-ART care and additional counseling; provide information on local HIV services' providers and support networks.
- Counsel on HIV re-infection, prevention & transmission
- If HIV diagnosis is not accepted (i.e. the client is in denial) – refer for additional counseling

2.5 HIV TESTING ALGORITHM

2.5.1 In adults and children above 18 months of age:

Diagnosis of HIV infection in adults and children older than 18 months is usually done by detection of Ab to HIV using rapid tests or Enzyme Immunoassays (EIA). The approved HIV rapid test kits for use in South Sudan in the HIV testing algorithm are Determine (used as the screening or first test), Unigold (used as the confirmatory test), and SD Bioline (used as the tiebreaker). The rapid tests can be performed using whole blood, serum or plasma samples. Whenever possible, rapid testing should be done with a finger prick sample. HIV rapid testing can be performed in the laboratory, in non-laboratory hospital setting, clinic or community settings by health care providers trained to perform HIV rapid tests. However, all testing done outside a laboratory setting must be supervised by qualified laboratory personnel to ensure accurate and quality results.

- The HIV rapid testing algorithm should use three rapid HIV test kits using the serial method. See schematic representation Figure 2-1

- All blood is first tested with one rapid assay (Determine), which is highly sensitive.

- Blood that is non-reactive on the first test (Determine) is considered HIV antibody negative.

- Any specimens that are reactive on the first assay (i.e. Determine reactive) should be tested again (for confirmation) using a different assay, Unigold.

- For specimens that are reactive on both the first and the second assays (Determine – reactive and Unigold – reactive positive), the result should be reported as HIV-positive.

- Specimens that are reactive on the first assay but non-reactive on the second assay (Determine – reactive; Unigold – non-reactive) should be repeated using the same specimen (when serum/plasma) with the same two assays. Repeating the assays helps eliminate discrepant results that are due to technical or other errors. If the repeat results are resolved in concordance i.e. either Determine-reactive; Unigold-reactive or Determine-non-reactive; Unigold-non-reactive, they may be reported as positive or negative, respectively.

- If the testing results remain discrepant (Determine-reactive; Unigold-non-reactive), the specimen should be further tested using a third assay, SD Bioline as the tie-breaker.

- If the third assay (SD Bioline) is non-reactive (Determine-reactive; Unigold-non-reactive; and SD Bioline-non-reactive), the test result is considered negative and reported as HIV-negative.

- If the third assay (SD Bioline) is reactive (Determine-reactive, Unigold-non-reactive, and SD Bioline-reactive), the test result is reported as HIV-inconclusive or indeterminate. The individual should be asked to return in 14 days for further testing.

Figure 2-1: HIV testing algorithm in Adults and Children over 18 months

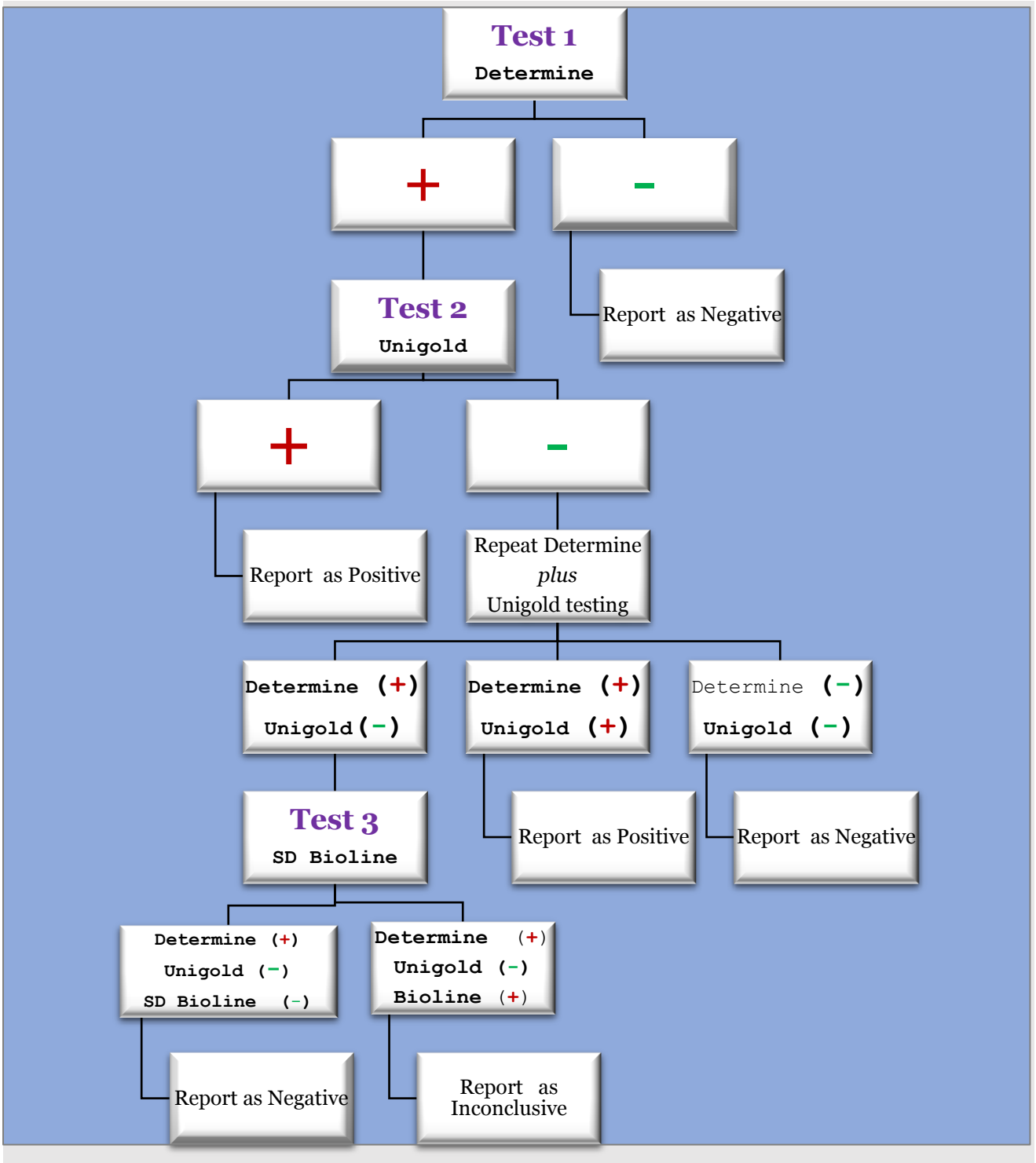
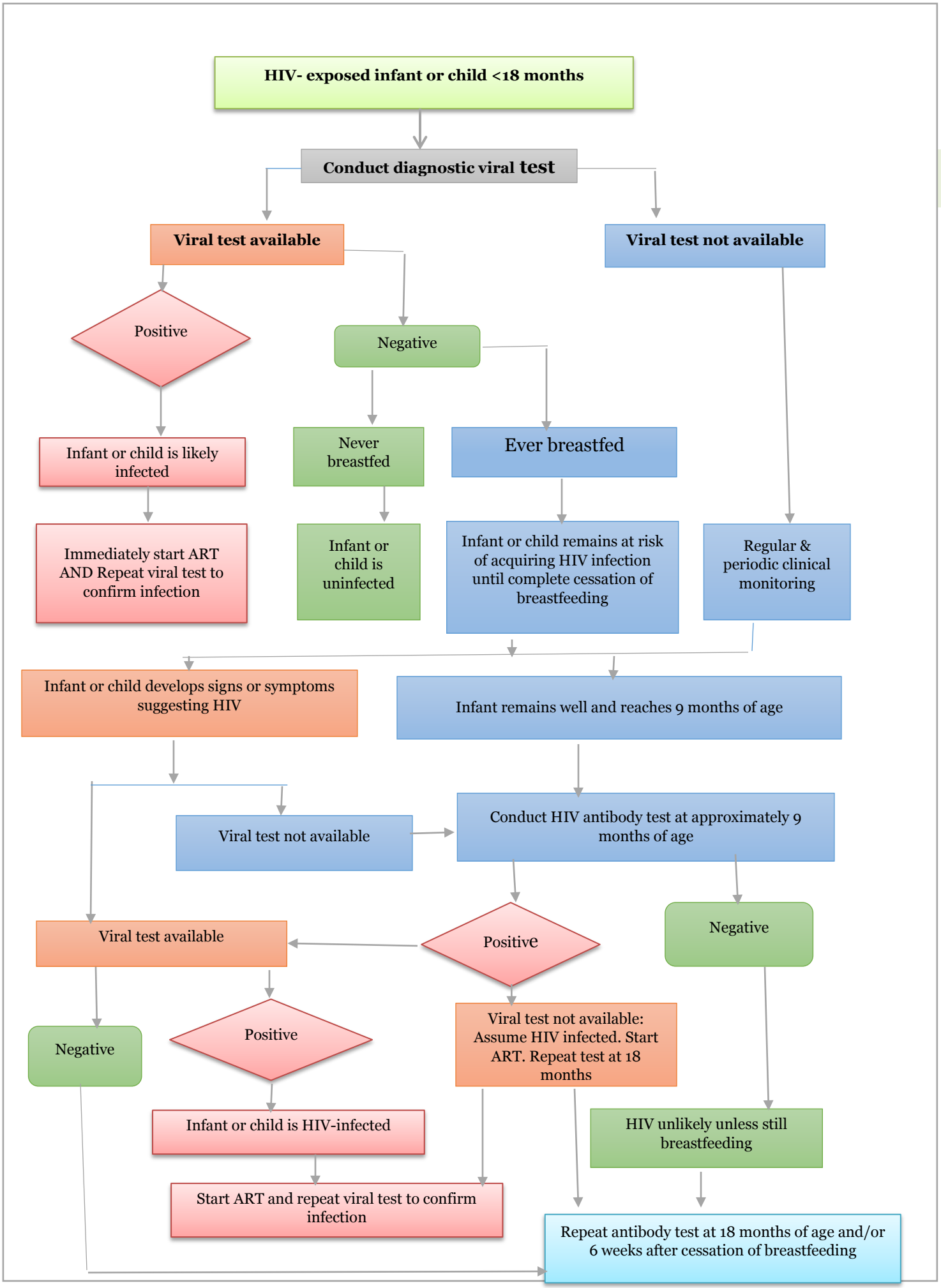


Figure 2-2: HIV testing algorithm for HIV-Exposed Infants



2.6 LINKAGE FROM HTC TO HIV PREVENTION, TREATMENT AND CARE

- Linkage to care is the process of assisting HIV-diagnosed persons to enter medical care. Linkage is described as successful when following receipt of HIV diagnosis, a client has attended an initial visit at the HIV medical care facility, has been registered, initiated on cotrimoxazole, and assessed for ART eligibility.
- Linkage to care enables early assessment for ART eligibility and timely initiation of treatment, as well as access to interventions to prevent HIV transmission, other infections and co-morbidities, and interventions to reduce the risk of loss-to-follow-up (LFTU).
- HTC services are required to be linked to local HIV treatment, care and support services and to other units of the respective health facilities. Linkage may be within the same facility (intra-facility), from one facility to another (inter-facility), or between community and facility.

Key barriers to linkage include:

- Psycho-social factors: related to knowledge, beliefs and motivation within a given social context
  - Lack of understanding of why it is important to enroll in care
  - Stigma and fear of disclosure of HIV status
  - Use of herbal and other medicine
- Structural factors, such as related to underlying economic conditions of daily life
  - Accessibility of care
  - Lack of transportation
  - Work responsibilities
  - Food insecurity
- Health care delivery factors:
  - Quality of care at the point of contact with the client (long waiting time, commodity stock-outs, conflict with staff, coordination of care, stigma)
  - Service inaccessibility (distance from home)

Recommended strategies for improving linkage in South Sudan include:

- *Integration of HTC with other services and use of rapid HIV testing kits at Point-of Care:* such as provision of PITC in the ANC, the TB clinic or OPD enhances linkage
- *Use of triplicate referral forms*; one form is given to the client, one remains at the referring site and the third form is sent to the client receiving site. At regular intervals, monitoring is carried out and clients that are lost-to-follow-up (LTFU) are actively tracked by providers
- *Use of linkage facilitators and other community support groups /workers*; immediately an individual is identified as HIV-infected, s(he) is physically escorted to the referral site from HTC site
- Client reminder and follow-up through *use of mobile phone short message service (SMS) reminders* or telephone calls
- *Immediate CD4 testing at HTC sites for ART eligibility assessment*: e.g. through use of Point-of-Care (POC) CD4 technology or other on-site CD4 testing where available.

3 PRE-ART AND CHRONIC HIV CARE

Enrollment into chronic HIV care enables early ART eligibility assessment and timely initiation of treatment, as well as access to interventions to prevent further HIV transmission, and prevention of infections and co-morbidities. Entry points into HIV care include HTC sites in health facilities and communities.

Key services provided in Pre-ART care:

1. Clinical Monitoring of HIV disease 3.1
2. WHO clinical staging 3.2
3. CD4 monitoring 3.3
4. Nutrition Assessment Counseling and Support 3.4
5. Management of HIV related disease (including TB screening and treatment) 3.5
6. Provider initiated Family Planning 6.2.2
7. Prevention with Positives (PwP) / Positive Health Dignity and Prevention (PHDP) 3.7
8. Cotrimoxazole Preventive Therapy (CPT) 3.6
9. Insecticide treated bed net (ITNs) 3.5.1
10. Palliative care and management of other co-morbidities 3.5.5

All Pre-ART clients should be registered, have a medical record opened, and have a clear follow-up plan.

3.1 MONITORING HIV DISEASE

Clinical monitoring should be performed routinely for all pre-ART individuals at every visit to ascertain WHO clinical stage and exclude opportunistic infections. This should include medical history, physical examination, and laboratory assessment with CD4 monitoring for ART eligibility (if necessary), TB screening, and pregnancy screening. See Table 3-1

History:

- Demographics (age, sex, etc.)
- History of OIs & other illnesses e.g. TB symptoms, hospitalizations, surgeries previous ART
- Symptoms of chronic pain and depression
- Current medications (including anti TB drugs, traditional therapies etc.)
- Pregnancy risks: contraception choices, current or planned pregnancy
- Sexual risks and disclosure: willingness to practice safer sex, disclosure of HIV sero-status, use of condoms, HIV counseling and testing of sex partners and children.
- Psychosocial: availability of treatment supporters and identification of potential barriers to pre-ART and future ART adherence and retention

Physical exam:

- Weight & height in all clients , plus Mid-Upper Arm Circumference (MUAC)in children 6-59 months
- Nutritional status (wasting, oedema, pallor, nail changes
- Functional capacity
- Examination of vital signs, skin, eyes, oropharynx (presence of thrush), lymph nodes, lungs, heart, abdomen, genital tract (for STIs), extremities, nervous system

Table 3-1: Lab Assessment at Enrolment into Pre-Art Care

Lab test	***Purpose***	***Comment***
Recommended Tests		
Confirming HIV serostatus	Ensure that national testing algorithm has been followed	Retesting to confirm HIVV is good practice to ensure correct diagnosis
CD4 testing	To assess eligibility for ART (after excluding those eligible for immediate ART) **NB: Laboratory monitoring is not a pre-requisite for ART initiation**	For the following clients , send for ART immediately: ○ Age under 5 years ○ WHO clinical stage 3 and 4 ○ Pregnant or breast feeding women ○ TB clients ○ HBV clients that require HBV treatment ○ HIV positive partners in serodiscordant couples
Screen for pregnancy or ask if planning to conceive	To identify women eligible for ART	Women living with HIV found to be pregnant or breast feeding should be referred to initiate ART immediately regardless of clinical stage or CD4.
* Screen for TB symptoms	To identify PLHIV with active TB	PLHIV diagnosed with active TB should receive TB treatment, followed by ART immediately as per guidelines
Desirable tests – only performed where available		
HBV testing	To identify HBV/HIV co-infected	PLHIV diagnosed with HBV that requires treatment should receive ART immediately NB: HBV testing is currently only available at a few tertiary hospitals in SS.
Haemoglobin	To detect anaemia	
Symptom directed lab tests to diagnose pre-existing illnesses:	See management of HIV related diseases Table 3-5	

NB: *This is a clinical symptom screen, but lab evaluation is recommended if symptomatic

3.2 WHO CLINICAL STAGING

- Clinical staging should be performed at HIV diagnosis, on entry into clinical pre-ART care, and at every visit in pre-ART care to help guide decisions on ART and related care.

- HIV-related diseases are grouped into four (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. See Table 3-2 for staging in adults and adolescents and Table 3-3 for staging among children.

- Clients in WHO stage 3 or 4 are always eligible to start ART. Other eligibility criteria apply for clinical stage 1 and 2.

- WHO clinical staging requires confirmed HIV infection.
  - An infant aged under 18 months with only a positive HIV rapid antibody test can NOT be given a WHO clinical stage because in infants, HIV antibodies do not confirm HIV infection.
  - However, an infant with HIV antibodies and specific clinical conditions is very likely to have AIDS and needs to start ART without delay (see Table 2-4 for Presumptive diagnosis of severe HIV disease)
- Ongoing clinical assessment of patients on ART is important to determine presence of opportunistic infections, signs of immune reconstitution syndrome, and medication side effects.

Table 3-2: WHO Clinical Staging for HIV Infections: Adults and Adolescents

Clinical Stage I:
- Asymptomatic
- Persistent generalized lymphadenopathy

Clinical Stage II:
- Moderate unexplained weight loss (less than 10% of presumed or measured body weight)
- Recurrent respiratory tract infections, e.g., bacterial sinusitis, tonsillitis, otitis media and pharyngitis
- Herpes zoster
- Minor mucocutaneous manifestations (seborrhoeic dermatitis, prurigo, fungal nail infections, recurrent oral ulcerations, angular stomatitis)

Clinical Stage III:
- Unexplained severe weight loss (more than 10% of presumed or measured body weight)
- Unexplained chronic diarrhea for longer than 1 month
- Unexplained persistent fever (intermittent or constant for longer than 1 month
- Persistent oral candidiasis
- Oral hairy leukoplakia
- Pulmonary tuberculosis (current)
- Severe bacterial infections such as pneumonias, pyomyositis, empyema, bone or joint infection, bacteremia or meningitis
- Acute necrotizing ulcerative stomatitis, gingivitis or periodontitis
- Unexplained anemia (<8gm/dl), neutropenia ($<0.5\times 10^9$ per litre), or chronic thrombocytopenia ($<50\times 10^9$ per litre)

Clinical Stage IV:
- HIV wasting syndrome –
- *Pneumocystis carinii (jiroveci)pneumonia* (PCP)
- Recurrent severe bacterial pneumonia
- Chronic herpes simplex (HSV) infection (orolabial, genital, or anorectal of more than 1 month or visceral at any site
- Oesophageal candidiasis (or candidiasis of the trachea, bronchi or lungs)
- Extrapulmonary tuberculosis
- Kaposi's sarcoma
- Cytomegalovirus infection (retinitis or infection of other organs)
- Central Nervous system toxoplasmosis
- HIV encephalopathy
- Extrapulmonary cryptococcosis including meningitis
- Disseminated non-tuberculous mycobacterial infection
- Progressive multifocal leukoencephalopathy (PML)
- Chronic cryptosporidiosis
- Chronic isosporiasis
- Disseminated mycosis such as histoplasmosis, coccidioidomycosis
- Lymphoma (cerebral or B-cell non-Hodgkin)
- Symptomatic HIV-associated nephropathy or cardiomyopathy
- Recurrent septicaemia (including non-typhoidal Salmonella)
- Invasive cancer of the cervix
- Atypical disseminated leishmaniasis

Table 3-3: WHO Clinical Staging of HIV in children

Clinical Stage I:
- Asymptomatic
- Persistent generalised lymphadenopathy

Clinical Stage II:
- Unexplained persistent hepatosplenomegaly
- Recurrent or chronic upper respiratory tract infections (otitis media, otorrhoea, sinusitis, tonsillitis)
- Herpes zoster
- Lineal gingival erythema
- Recurrent oral ulceration
- Papular pruritic eruption
- Fungal nail infections
- Extensive wart virus infection
- Extensive molluscum contagiosum
- Unexplained persistent parotid enlargement

Clinical Stage III:
- Unexplained moderate malnutrition not adequately responding to standard therapy
- Unexplained persistent diarrhoea (14 days or more)
- Unexplained persistent fever (above 37.5 °C, intermittent or constant, for longer than one month)
- Persistent oral candidiasis (after first 6 weeks of life)
- Oral hairy leukoplakia
- Acute necrotizing ulcerative gingivitis/periodontitis
- Lymph node TB
- Pulmonary TB
- Severe recurrent bacterial pneumonia
- Acute necrotizing ulcerative gingivitis or periodontitis
- Unexplained anaemia (<8.0 g/dl), neutropenia (<0.5 x 10^9/L) or chronic thrombocytopenia (<50 x 10^9/ L)
- Symptomatic lymphoid interstitial pneumonitis
- Chronic HIV-associated lung disease including bronchiectasis

Clinical Stage IV:
- Unexplained severe wasting, stunting or severe malnutrition not responding to standard therapy
- Pneumocystis pneumonia (PCP)
- Recurrent severe bacterial infections (e.g. empyema, pyomyositis, bone or joint infection, meningitis, but excluding pneumonia)
- Chronic herpes simplex infection; (orolabial or cutaneous of more than one month's duration, or visceral at any site)
- Oesophageal candidiasis (or Candida of trachea, bronchi or lungs)
- Extra pulmonary TB
- Kaposi sarcoma
- Cytomegalovirus (CMV) infection; retinitis or CMV infection affecting another organ, with onset at age over 1 month
- Central nervous system toxoplasmosis (after the neonatal period)
- HIV encephalopathy
- Extra pulmonary cryptococcosis (including meningitis)
- Disseminated non-tuberculous mycobacteria infection
- Progressive multifocal leukoencephalopathy
- Chronic cryptosporidiosis (with diarrhoea)
- Chronic isosporiasis
- Disseminated endemic mycosis (extrapulmonary histoplasmosis, coccidiomycosis)
- Cerebral or B cell non-Hodgkin lymphoma
- HIV-associated cardiomyopathy or nephropathy

3.3 CD4 MONITORING

- CD4 cell counts are the most direct routine measure for HIV immune suppression. CD4 should be measured at the time of HIV diagnosis AND for those not yet eligible for ART, monitored every 6 months while in pre-ART follow-up. Use CD4 counts to monitor ART eligibility only in clients who would otherwise not be eligible.
- CD4 cell is not a pre-requisite to initiate ART for the following clients ;
    - Age under 5 years
    - WHO clinical stage 3 and 4
    - Pregnant or breast feeding women
    - TB clients
    - Clients with HBV who require treatment for their HBV infection
- Use of clinical criteria alone tends to under-diagnose eligibility for ART

3.4 NUTRITION ASSESSMENT, COUNSELING, AND SUPPORT (NACS)

Low food intake combined with increased energy demand because of HIV infection and related infections may lead to HIV-related weight loss and wasting. Nutritional assessment counseling and support is a key intervention, should be an integral component of HIV care, and should be part of interventions available to PLHIV, both adults and children both at the facility and in the community.

3.4.1 Nutritional Assessment

Nutrition assessment involves collecting information about a client's medical history, dietary patterns, anthropometric measurements, clinical and biochemical characteristics, and social and economic situation. Nutrition assessment requires training and should be done by clinicians, dieticians, and nutritionists. For PLHIV, assessment should be performed at enrolment into care and monitored at every visit.

- Nutritional assessment should be conducted to identify;
    - PLHIV at risk of malnutrition for early intervention including referral
    - malnourished clients for treatment and/or referral;
    - behaviors that can increase the risk of malnutrition and food insecurity
    - PLHIV and households that require nutrition education and counseling
- Nutritional assessment should involve; measuring and recording height and weight for adults, and for children, plotting the measurements on a standard growth curve. The mid-upper arm circumference can additionally be used; evaluation of clinical and dietary factors for the individual/household and referral to relevant services. See Figure 3-1
- Weigh and record the weight in kg to the nearest 100gm at every visit (children and adults)
- Measure and Record the length / height (using a head board) to the nearest cm at every visit for children, and once at enrolment for adults
- Use the above measurements to determine weight-for-height z-score (WHZ) for children and BMI for adults.

- To classify nutritional status among non-pregnant adults 15 years and above, use BMI.
- Use MUAC to classify nutritional status in the following groups:
  - Children 0-14 years;
  - Adolescents as an alternative to BMI-for-age
  - Pregnant women and women up to 6 months postpartum;
  - Non-pregnant/postpartum adults whose weight and height cannot be measured (e.g., if they cannot stand or no equipment is available).
- See Figure 3-1, Figure 3-2 , and Figure 3-3 for use of BMI, WHZ, and MUAC thresholds

Anthropometric measurements include weight, height, and mid-upper arm circumference (MUAC). Body mass index (BMI) and weight-for-height are anthropometric measurements presented as indexes. Each of these indexes is recorded as a z-score. Z-scores are measured in standard deviations (SD), which describe how far and in what direction an individual's anthropometric measurement deviates from the mean (for a healthy person of the same age and sex).

Weight:	Essential to help determine weight-for-height z-score (WHZ) for children and BMI for adults. Record weight in kg to the nearest 100gm at every visit (children and adults).
Length and height:	Record length / height to the nearest cm at every visit for children, and once at enrolment for adults.
Weight-for-height:	WHZ is an index to assess the nutritional status of children from birth to 59 months of age. WHZ compares a child's weight to the weight of a child of the same length/height and sex in the WHO Child Growth Standards to classify the child's nutritional status. There are separate standards for boys and girls.
Mid-upper arm circumference (MUAC):	The circumference of the left upper arm measured at the mid-point between the tip of the shoulder and the tip of the elbow, using a measuring tape. MUAC is a proxy measure of nutrient reserves in muscle and fat that are unaffected by pregnancy and independent of height. MUAC is quicker and simpler than WHZ to assess nutritional status in children less than 5 years.
Body mass index (BMI):	BMI is an anthropometric indicator based on weight-to-height ratio. It is the preferred indicator of body thinness to classify malnutrition in adults and adolescents 15 years and older who are not pregnant or postpartum. Calculate BMI by dividing a person's weight in kg by the square of the person's height in meters (m).

In addition to anthropometric assessment, general assessment of PLHIV should involve the following;

- Checking for physical signs of nutritional deficiencies such as bilateral pitting edema, wasting, pallor, hair changes.
- Assessing for signs of symptoms of other infections that can increase nutrient needs (e.g., fever) and nutrient loss (e.g., diarrhea and vomiting), conditions that impair ingestion of food (oral candidiasis) and managing appropriately
- Medication history to know if there are dietary restrictions based on ART regimen.
- Dietary assessment to obtain information on dietary quantity and quality, changes in appetite, food allergies and intolerance, and reasons for inadequate food intake during or after illness.
- Food Security Assessment: PLHIV households and communities should be assessed for food security which involves; food availability (having sufficient quantities of food available consistently to all people in a household), food access (adequate resources to obtain a sufficient quantity and quality of food), and food utilization/consumption.
- Biochemical assessment which involves checking levels of nutrients in a person's blood, urine, or stools.

3.4.2 Nutrition counselling and support:

Based on each individual's assessment (using BMI in adults and MUAC in children below 14 years of age), specific nutritional support should be provided – education, counselling, therapeutic feeding (TF), supplemental feeding (SF), or other.

Counselling: Nutrition counseling utilizes information from nutrition assessment (above) to enable the PLHIV and affected household members to work with health staff to prioritize actions based on the nutritional assessment to improve nutritional status. Counseling can allow the identification of challenges and discussion of possible locally available solutions to problems. Nutrition counseling can be provided by nurses, nutritionists, or designated counselors. If facility-based health care providers have limited time or training in counseling, task shifting should be considered to train mid-level health workers or community health workers to provide nutrition counseling.

- At the clinic level clients should be provided with group education on key nutrition topics
- At the community level clients and their household members can be receive this information through support groups facilitated by community health care workers/expert clients or HCWs

Support: Nutritional support should be provided based on information from the assessment and existing facility and community resources. Nutrition support can include specialized food products to treat malnutrition, micronutrient supplements to prevent or treat micronutrient deficiencies, point-of-use water purification products, and referral to economic strengthening and livelihood support.

- For adult PLHIV, watch out for any weight loss over time. Review documented previous weight whenever available as reported weight loss can be unreliable. Investigate any weight loss for TB. For any weight loss >10% and/or BMI under 18.5, investigate for TB, and start ART if weight loss unexplained (WHO stage 3). If BMI is under 17: Start TF for 'moderate malnutrition'. If BMI is under 16: Start TF for 'severe malnutrition'. Adults with BMI 16-18.5 should receive Supplemental feeding (SF) until the client's BMI stabilizes above 18.5

- For children, Plot the weight on a child health card (see Figure 6-2). Watch out for flattening of the growth curve (weight for age). Categorize Severe Malnutrition using the table below. If the weight-for-height is less than 80% and/or Mid Upper Arm Circumference (MUAC) is less than 11.5 cm, investigate for tuberculosis (TB); refer / admit for Therapeutic Feeding (TF); and start ART if no response to TF after 3 weeks (WHO stage 3).

Categorise Severe Malnutrition Using the Table			
Weight-for-height (%)	Weight-for-age (%)	Oedema	
		Present	Absent
70-79%	60-80%	Kwashiorkor	Underweight
Less than 70%	Less than 60%	Marasmic Kwashiorkor	Marasmus

Food and/or micronutrient supplementation should be provided where necessary and where available. Adults PLHIV should be advised to consume diversified diets from locally available foods. PLHIV (and their families) who are food insecure should be referred to existing 'Food Security and Sustainable Livelihood' programs that will help them achieve household food-security and benefit from livelihood assessment and support.

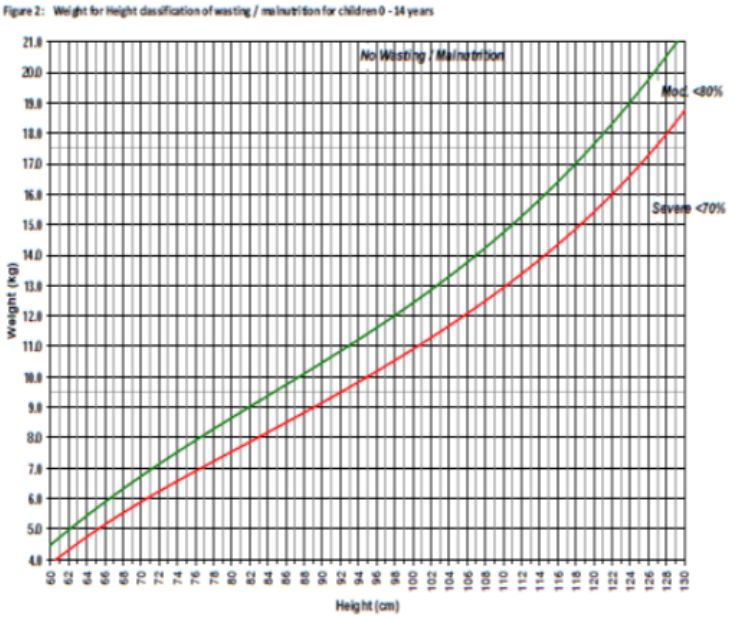
Figure 3-1: Nutritional Assessment for children 0-14 years

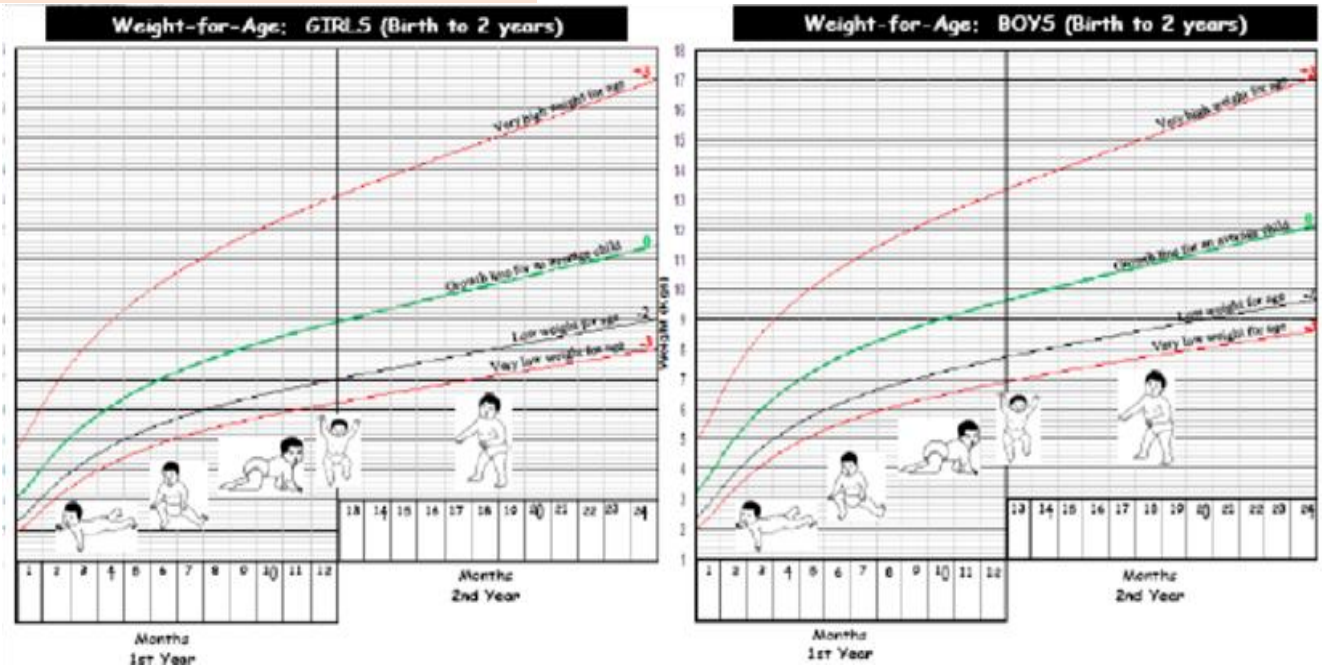
Age 0-14 years

Classify wasting / malnutrition status according to weight-for-height form – See adjacent figure

- Watch out for flattening of the growth curve (weight for age)
- Weight-for-height less than 80% and/or Mid Upper Arm Circumference (MUAC) less than 11.5cm:
  - Investigate for tuberculosis (TB)
  - Refer / admit for Therapeutic Feeding (TF)

Start ART if no response to TF after 3 weeks (WHO stage 3)





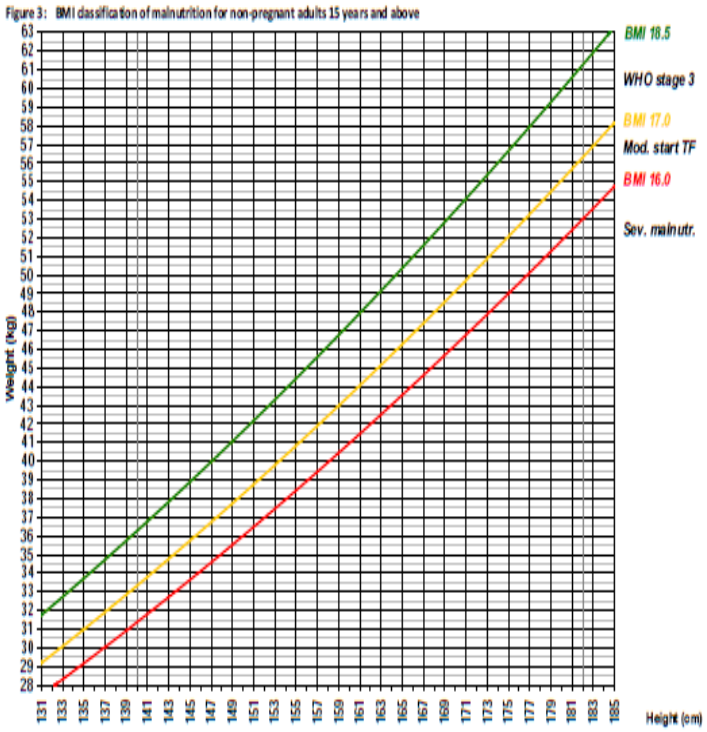
MUAC cut-offs to classify nutritional status in children 6 months to 14 years of age				
	Severe acute malnutrition (SAM)	**Moderate acute malnutrition (MAM)**	**Moderate malnutrition**	**Normal**
6–59 months	< 115 mm	≥ 115 to < 125 mm		≥ 125 mm
5–9 years	< 135 mm		≥ 135 to < 145 mm	≥ 145 mm
10–14 years	< 160 mm		≥ 160 to < 185 mm	≥ 185 mm
	Severe acute malnutrition (SAM)	Moderate acute malnutrition (MAM)	Moderate malnutrition	Normal

Figure 3-2: Nutritional Status assessment in non-pregnant adults 15 years and above

Non-pregnant adults 15 years and above

- Classify nutritional status according to Body Mass Index (BMI): BMI = weight in kg / height in m^2
- Watch out for any weight loss over time
    - Review documented previous weight whenever available as reported weight loss can be unreliable
    - Investigate any weight loss for TB
- Weight loss >10% and/or BMI under 18.5
    - Investigate for TB
    - Start ART if weight loss unexplained (WHO stage 3)
- BMI under 17: Start TF for 'moderate malnutrition'

BMI under 16: Start TF for 'severe malnutrition'



BMI classifications in adults

BMI	Nutritional status
< 16.0	Severe malnutrition
≥ 16.0 to < 17.0	Moderate malnutrition
≥ 17.0 to < 18.5	Mild malnutrition
≥ 18.5 to < 25.0	Normal nutritional status

WHO BMI-for-age classifications of malnutrition in adolescents 15–18 years of age

BMI-for-age	Nutritional status
< −3 z-score	Severe malnutrition
≥ −3 and < −2 z-score	Moderate malnutrition
≥ −2 and < −1 z-score	Mild malnutrition
≥ −1 z-score	Normal nutritional status

MUAC cut-offs to classify nutritional status in adults

Non-pregnant/postpartum	Pregnant/postpartum	Nutritional status
<190 mm	<190 mm	SAM
≥ 190 to < 220 mm	≥ 190 mm to < 230 mm	Moderate malnutrition
≥ 220 mm	≥ 230 mm	Normal nutritional status
Non-pregnant/postpartum	Pregnant/postpartum	Nutritional status

Figure 3-3: Nutritional Status assessment in pregenent and lactating women

Pregnant and lactating women

- Use Mid Upper Arm Circumference (MUAC) instead of BMI
- Universally eligible for ART if confirmed HIV infection
- MUAC less than 22cm: start TF for 'moderate malnutrition'

MUAC less than 19cm: start TF for 'severe malnutrition'

MUAC cut-offs to classify nutritional status in adults

Non-pregnant/postpartum	Pregnant/postpartum	Nutritional status
<190 mm	<190 mm	SAM
≥ 190 to < 220 mm	≥ 190 mm to < 230 mm	Moderate malnutrition
≥ 220 mm	≥ 230 mm	Normal nutritional status

3.5 MANAGEMENT OF HIV-RELATED DISEASE, CO-INFECTIONS, AND OTHER CO-MORBIDITIES

Opportunistic Infections (OIs) are the most important cause of morbidity and mortality in HIV-infected individuals. Improvement in the recognition, treatment and prevention of these conditions in PLHIV has been shown to reduce morbidity and mortality. Prevention of OIs involves client education, behaviour modification, as well as judicious use of chemoprophylaxis. The most common OIs include tuberculosis (TB), bacterial respiratory tract infections, skin conditions and diarrheal diseases.

This section gives a brief overview on the management of selected OIs, common co-infections, and co-morbidities. Refer to Table 3-5, and national Opportunistic Infections (OI) guidelines for further guidance. Refer to Chapter 9 and National TB & Leprosy guidelines for TB/HIV co-management.

3.5.1 Malaria and HIV

- PLHIV in malaria endemic regions are at high risk of complications of malaria. Infants, children under five years of age, and pregnant women are particular risk of severe and complicated malaria.
- Key malaria control interventions include prompt and effective treatment, use of insecticide treated mosquito nets (ITNs), indoor residual spraying (IRS) to control the vector mosquitoes, and intermittent preventive treatment during pregnancy.
- PLHIV (as for the general population) should routinely use insecticide-treated bed nets or have access to indoor residual spraying to reduce their risk of exposure to malaria.
- Treatment or intermittent preventive treatment with sulfadoxine-pyrimethamine should not be given to clients with H IV receiving cotrimoxazole prophylaxis.
- PLHIV who develop malaria should receive prompt and effective anti-malaria treatment using artemisinin based combination therapies (ACTs)
- Refer to *National Malaria treatment guidelines* for more detail.

3.5.2 Hepatitis B and C

- Viral hepatitis is an increasing cause of morbidity and mortality among PLHIV including those on ART. The sero-prevalence of hepatitis B virus infection in South Sudan is estimated at 12.8% in the general population. Among the PLHIV, 11.8% are co-infected with HBV (program data 2012).
- Clients co-infected with HIV and HBV (requiring treatment for their HBV infection) should be initiated on ART immediately irrespective of CD4 count or clinical stage using a TDF/3TC (or FTC) containing regimen. patients needing second line should be screened for HBsAg and if positive TDF should be continued in the secondline regimen
- Initiating ART among PLHIV and hepatitis C should follow the same principles as for the general population of people living with HIV.

3.5.3 Prevention and Treatment of Sexually Transmitted Infections (STIs)

- HIV is a sexually transmitted infection with the majority of adults acquiring the infection sexually.
- STIs are important co-factors in the transmission of HIV infection; the presence of either inflammatory or ulcerative STIs facilitates both the acquisition and transmission of HIV infection.
- All health care settings should deliver HIV prevention services including prevention counseling, access to condoms, RPR or VDRL testing for syphilis, and syndromic screening and treatment of STIs. For more detail on syndromic management of STIs refer to national STI guidelines.

3.5.4 Cryptococcus neoformans: screening and treatment

Cryptococcal meningitis is a major cause of morbidity and mortality even after ART has been initiated. Early diagnosis is key to improving mortality. Prevalence of cryptococcaemia is higher at low CD4 counts. NB: Data on prevalence of cryptoccocal disease in South Sudan is currently unavailable.

- *Screening for Cryptococcus neoformans and pre-emptive therapy for asymptomatic infection:*
    - Where test kits are available (lateral flow assay - LFA), ART-naive adults with a CD4 count of less than 100 cells/mm3 should have routine serum or plasma *cryptococcus neoformans* antigen (CrAg) screening performed using LFA prior to ART initiation. CrAg-positive adults should be treated with pre-emptive antifungal therapy. Treatment of asymptomatic CrAg positive infection is by use of fluconazole 800 mg daily for 2 weeks followed by 400mg daily for 8 weeks. Initiate ART after 2 weeks of starting fluconazole pre-emptive treatment.

- *Treatment of symptomatic cryptococcal disease:*
    - Immediate ART is not recommended in PLHIV with cryptococcal meningitis due to the high risk of life threatening IRIS
    - In HIV-infected clients with recent diagnosis of cryptococcal diseases, ART initiation should be deferred until there is evidence of sustained clinical response to antifungal therapy (2-4 weeks of treatment with Amphotericin B containing regimens and 4-6 weeks with high dose Fluconazole containing regimens)

3.5.5 Palliative care and other co-morbidities

- *Palliative care- symptom management and end-of-life care:* PLHIV may experience various forms of pain and other discomfort. Care providers should identify and treat the underlying cause when possible, while controlling the pain using the WHO analgesic ladder.
    - Step 1 mild pain: Non-opioid (e.g. paracetamol)+/- adjuvant
      Step 2 for moderate pain: Weak opioid (codeine phosphate) +/- non-opioid +/- adjuvant
      Step 3 for severe pain: Strong opioid (e.g. morphine) +/- non-opioid +/- adjuvant

  Adjuvants include:
    - **NSAIDs** (non-steroidal anti-inflammatory drugs): can be used as co-analgesics and are useful in reducing inflammation
    - T**ricyclic anti-depressants** - e.g. Amitriptyline, useful in treatment of burning nerve pain e.g. that due to post herpetic neuralgia
    - **Anticonvulsant medications** – e.g. Carbamazepine, phenytoin useful in treatment of stabbing type nerve pain

  See http://www.who.int/cancer/palliative/painladder/en/ for more detail

- *Non-communicable diseases:*
    - PLHIV are at increased risk of developing a range of non-communicable diseases (NCDs), including cardiovascular disease, diabetes, chronic lung disease and some types of cancer such as Kaposi's sarcoma, cervical cancer and non-Hodgkin's lymphoma. Blood pressure should be routinely monitored for all PLHIV.
    - *Cervical cancer*: In many African countries, cervical cancer is the number one cancer causing death in women. HIV infected women are more likely to develop both pre-invasive and invasive cervical cancer and have a poorer outcome than their HIV negative counterparts. Screening for pre-invasive cervical lesions should therefore ideally be a part of services offered to HIV infected women. Programs should aim to adopt at a minimum simple methods of screening such as visual inspection (VIA) methods and refer clients for better a management to a site where services are available; this would take into account the lack of infrastructure to support more complex screening systems.

- *Mental Health:* PLHIV and their caregivers may have a wide range of mental health needs. The most common mental health comorbidities among PLHIV include depression, anxiety, dementia and other cognitive disorders and substance use disorders.

NB: Refer to the relevant national guidelines for detailed management of the above conditions.

Table 3-4: Common Opportunistic Infections and Management

	Clinical Signs	*Diagnosis / investigations*	*Primary Management*	*Secondary Management*
Oral candidiasis	Multiple whitish or red patches anywhere inside mouth		**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*** 3 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 **Ketoconazole tablets** Do not give with NVP **Adult:** 200mg 24-hourly for 14 days **Child:** 5mg/kg 24-hourly for 14 days **Miconazole gum patch or gel** Use for children > 4 months and adults Treat with 1 patch 24-hourly for 14 days
Oesophageal candidiasis	Retrosternal pain on swallowing; infants & children refusing to eat; +/- oral thrush		**Fluconazole tablets** Treat for 14 days **Adult:** 200mg 24-hourly for 14 days **Child:** 12mg/kg day one then 6mg/kg	
Chronic diarrhoea	More than 3 loose non-bloody motions per 24 hours for more than 2 weeks	Based on response to stepwise empirical treatment: **Step 1** treats: isospora, cyclospora, bacterial **Step 2** treats: giardia, clostridium, amoeba, microspora. **Step 3** treats: microspora., helminths	**ORS** Drink 5ml/kg 4-hourly and after every episode of diarrhoea. 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	Continue with step 2 and 3 if no improvement **Step 2: Metronidazole tablets** **Adult:** 800mg 8-hourly for 7 days **Child:** 15mg/kg 8-hourly for 7 days **Step 3: Albendazole tablets** **Adult:** 400mg 12-hourly for 14 days

	Clinical Signs	*Diagnosis / investigations*	*Primary Management*	*Secondary Management*
TB	Cough (of any duration), fever, weight loss, and night sweats are most predictive. PLHIV may not have productive cough. Children may have failure to thrive; Extra - pulmonary TB signs and symptoms variable, but can include enlarged lymph nodes; meningeal signs	2x sputum for AFB and Xpert MTB/Rif (where available); CXR if smear-negative; fine needle aspiration nodes (for microscopy); pleural tap for biochemistry: straw coloured effusion; lumbar puncture: CSF for biochemistry, microscopy, Xpert and mycobacterial culture. **/ TB contacts in household should be assessed for symptoms; if symptoms present, diagnostic testing as above.**	**1st Line TB treatment** **New smear-positive or negative PTB:** Intensive phase: 2 RHZE Continuation phase: 4 RH **TB Meningitis:** Intensive phase: 2 SRHZ Continuation phase: 6 RH	**Relapse/ return after default/ treatment failure/ recurrent TB. Important to obtain Xpert MTB/Rif and mycobacterial culture and DST to diagnose MDR** Admit for Intensive phase: 2 SHRZE 1 RHZE (in hospital) Continuation phase: 5 RHE **Chronic/MDR-TB** Specialized treatment
Cervical cancer	No early symptoms therefore active screening needed; abnormal vaginal discharge	**Acetic acid visualization (VIA)** Use good light source Expose cervix with cusco speculum, visualise cervix after washing for 2 minutes with a large cotton swab immersed in 4% acetic acid	**Surgical, depending on stage**	
Herpes zoster (Shingles)	Grouped blisters in one patch; intense pain /burning; +/- fever; +/- body pains; lesions do not usually cross the body's mid-line		**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	
Pruritic papular eruptions	Severe itching, evenly distributed normal or dark-coloured papules on trunk, arms or legs, often scratch-lesions		**Calamine Lotion** **Antihistamines**	**Corticosteroid cream or tablets** **Metronidazole tablets** 250mg 12-hourly for 7-14 days
Seborrhoeic dermatitis	Greasy, scaly rash in axilla, groin, scalp, neck, face		Clotrimazole or Miconazole cream / ointment	**Ketoconazole tablets** 200 mg twice daily for 7 days
Tinea corporis / cruris / pedis	Round reddened plaques with scaly edge in multiple sites,		**Whitfield's ointment** **Clotrimazole cream or Gentian-Violet paint** Apply twice daily for 3-4 weeks	**Griseofulvin tablets** **Adult:** 500 mg 12-hourly for 4-6 weeks **Child:** 20mg/kg per day for 4-6 weeks

	Clinical Signs	*Diagnosis / investigations*	*Primary Management*	*Secondary Management*
	poss. widespread			
Pneumocystis carinii (jiroveci) pneumonia (PCP)	Extreme shortness of breath; dry cough; +/- fever Severe pneumonia in infants <12 months	**O_2 saturation**: hypoxia **CXR:** Diffuse interstitial infiltrates or hyperinflation; bats wing shadow Treat for empirically for PCP any HIV exposed or confirmed infected infant presenting with severe pneumonia	**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 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	**Clindamycin** 300mg 6-hourly for 3 weeks + **Primaquine** 30mg 24-hourly for 3 weeks
Cryptococcal meningitis Refer to 3.5.4 for screening to prevent cryptococcal meningitis)	Slow onset severe headache; confusion; convulsions; +/- fever; +/- neck stiffness	**CSF** India ink stain; **CrAg:** cryptococcal antigen in serum or CSF	**Admit** Therapeutic spinal tap (up to 20ml per puncture) **Fluconazole tablets** **Adult:** 1200mg 24-hourly for 14 days 400mg 24-hourly for 42 days 200mg 24-hourly for life **Child:** 12mg/kg 24-hourly for 2 weeks 6mg/kg 24-hourly for life	**Amphotericin B** (Specialized sites only) **Adult and Child:** 0.7-1mg/kg IV over 6 hours 24-hourly for 14 days **Fluconazole tablets** **Adult:** 400mg 24-hourly for 42 days 200mg 24-hourly for life **Child:** 6mg/kg 24-hourly for life For asymptomatic infection see 3.5.3
Pneumonia	Productive cough; chest pain; fever; tachypnoea / dyspnoea	***Diagnosis / investigations*** Infiltrations on CXR Rule out tuberculosis	Child: Mild: Tachypnoea but no dyspnoea Adult: Mild to moderate presentation: **Amoxicillin tablets** 500mg 8-hourly for 5 days **Doxycycline or Erythromycin if no response**	Severe presentation: **Chloramphenicol + Benzyl Penicillin** **Add Gentamycin if no response**
Sepsis	Severe illness; fever (can be absent, especially in children); fast heart rate; fast breathing	+/- Malaria parasites; do not rule out sepsis if malaria parasites are seen; blood culture for culture and sensitivity (if available)	**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 +	**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 +

	Clinical Signs	*Diagnosis / investigations*	*Primary Management*	*Secondary Management*
			Quinine 1200mg IV in 5% dextrose over 4 hours	**Quinine** 1200mg IV in 5% dextrose over 4 hours
Toxoplasmosis	Focal weakness, headache , confusion fever, seizures	**Clinical** **CT / MRI –** mass lesion	Preferred Adult: **pyrimethamine** 75 mg od **+** **sulfadiazine** 1.5gm 6 hourly + **leucovorin** 10-25mg od for 6 weeks Then maintenance therapy	**Option 2:** **Pyrimethamine 75 mg od + clindamycin 600mg qid + leucovorin for 10-25mg od for 6 weeks** *or* **TMP-SMX (TMP 5 mg/kg and SMX 25 mg/kg)** IV or PO BID for 6 weeks
Kaposi sarcoma	Single or multiple purple patches or nodes, mainly mouth, skin, conjunctiva, lung, GI tract; +/- enlarged nodes; +/- Oedema	Usually clear picture; children often present with lymphadenopathy only; consider KS even without skin or oral lesions if no response to EPTB therapy within 4 weeks	For all clients : **Analgesia** **Symptomatic treatment** **ART** For KS stage T0 (skin KS without oedema): **Delayed chemotherapy** if no improvement after 3 months on ART For KS stage T1 (KS in mouth or internal organs, nodular skin KS, skin KS with oedema): **Immediate chemotherapy** Contraindications for chemotherapy: Severe PN; Hb<10g/dl; platelet count <50/mm3; jaundice; pregnancy **1st Line: Vincristine** Each cycle consists of 6 doses; ensure strictly IV injection as infiltration causes burns; document therapy and response in health passport; examine for recurrence at every visit **Adult:** 2mg vincristine IV **Child:** 0.05 mg/kg vincristine IV (max 2mg) Review after every cycle: • Severe neuropathy / constipation: stop • Lesions cleared: stop • Good response but residual lesions: continue next cycle • Poor response: Start 2nd line chemotherapy 1) Initial cycle: 1 dose every 7 days for 6 weeks 2) 2) Second cycle: 1 dose every 14 days for 12 weeks 3) Final cycle: 1 dose every 28 days for 6 months	**2nd Line: Vincristine + Bleomycin** Cumulative max. lifetime dose for Bleomycin is 400 units for adults and 17 doses for children; stop bleomycin immediately if any sign for lung fibrosis (incl. cough, shortness of breath) are seen; give one combined dose every 14 days until cumulative max. dose is reached or until response is achieved; refer for 3rd line chemotherapy (doxorubicin) if poor response **Adult:** 15 units bleomycin IM / IV / SC **plus** 2mg vincristine IV **Child:** 0.5 mg/kg bleomycin IM **plus** 0.05 mg/kg vincristine IV (max 2mg)

3.6 COTRIMOXAZOLE PREVENTIVE THERAPY (CPT)

Cotrimoxazole is effective against common bacterial infections, including bacterial pneumonia, septicemia; diarrhea including that caused by *Isospora belli; toxoplasmosis; Pneumocystis Carinii (jiroveci) pneumonia (PCP);* and malaria. Cotrimoxzole is effective in both pre-ART and ART clients.

- All PLHIV including those on ART, regardless of age, or immunological status (CD4 count), should be given cotrimoxazole unless contraindicated. This includes all PLHIV diagnosed with TB.
- *Where CPT is contraindicated, give dapsone 100 mg OD or 50 mg BID in adults. Paediatric dose is 1 mg/kg of body weight per day*
- In HIV-exposed infants, CPT should be initiated at 6 weeks after birth and continued until the risk of HIV transmission is excluded (breast feeding has ended and infant is confirmed HIV negative).
- Do not give Sulfadoxine – Pyrimethamine (SP) to HIV infected pregnant women on CPT
- *See below dosing chart for cotrimoxazole and toxicity grading*.

Table 3-5: Dosing of cotrimoxazole in HIV-exposed infants, HIV-infected children and adults

Daily dose for age	Child tablet (100mg/20mg)	Single strength adults tablet (400mg/80mg)	Double Strength adult tablet (800mg/160mg)
Child 6wk-6mo:	1 tab od	¼ tab od	
6mo-5y: 2 tablets daily	2 tabs od	½ tab od	
6 months – 14 years		One tablet od	½ tablet od
Adult		Two tablets od	1 tablet daily

Table 3-6: Cotrimoxazole toxicity grading

Toxicity	Clinical description	Recommendation
GRADE 1	Erythema	Continue CPT with careful and repeated observation and follow-up. Provide symptomatic treatment, such as antihistamines, if available
GRADE 2	Diffuse maculopapular rash	
GRADE 3	Vesiculation, mucosal ulceration	CPT should be discontinued until the adverse effect has completely resolved (usually two weeks), and then reintroduction or desensitization can be considered
GRADE 4	Exfoliative dermatitis, Stevens-Johnson syndrome or erythema multiforme, moist desquamation	Co-trimoxazole should be permanently discontinued

3.7 PREVENTION WITH POSITIVES (POSITIVE HEALTH, DIGNITY, & PREVENTION)

At every visit, assess and counsel for;

- High risk sexual activity
- Partners' and children's HIV status
- Disclosure to partner /guardian / treatment supporter
- Signs and symptoms of STIs
- Pregnancy status
- Adherence to ART and other medications
- Abuse of alcohol and other substances

Prevention with Positives (PwP), also known as Positive Health, Dignity, and Prevention (PHDP), is a set of HIV prevention interventions for PLHIV with a focus on keeping PLHIV healthy physically, mentally and psychologically, as well as preventing transmission of HIV. PLHIVs should be provided with information about ways they can protect their own health:

- *Prevention of HIV transmission:* Encourage PLHIV to adopt safer sexual behaviour including abstinence, partner reduction, correct and consistent condom use. Condom use prevents HIV transmission, reduces risk of other STIs, and prevents unintended pregnancies.

- *Promote adherence to treatment:* Adherence to HIV treatment facilitates viral suppression, thus reducing HIV transmission risk, and also reduces risk of developing HIV drug resistance (HIVDR).

- *Disclosure and partner testing:* Discuss with PLHIV strategies for disclosing HIV status to sexual partners and family members. Offer HTC to the sexual partners and children born to all PLHIV. Provider- and/or counselor-mediated or supported disclosure are options for those who do not feel comfortable disclosing on their own.

- *PMTCT, Family Planning and safer pregnancy:* Encourage HIV-positive women and young people to discuss their reproductive options and supported to adopt PMTCT. See PMTCT section 6.2.2

- *STI care:* Provide education, diagnosis and treatment of sexually transmitted infections (STIs): Presence of active STIs can increase chances of HIV transmission.

- *Alcohol and other risk reduction:* Give PLHIV information about the risks of alcohol abuse. Heavy drinking can cause poor treatment adherence and increase disease progression. Under the influence of alcohol, individuals may be more likely to engage in risky behaviours, placing themselves at increased risk for acquiring STIs and placing their HIV negative partners at risk for infection.

- *Referral to community-based programs:* Prevention messages and strategies can be included in counseling, support groups or peer-led interventions, or through Home Based Care providers. Interventions including Income Generation Activities (IGAs), empowerment of women and girls increase the likelihood that individuals will have the means to change high-risk behaviours.

3.8 FOLLOW-UP IN PRE-ART CARE

While in chronic pre-ART care, it is important to ensure retention and minimize loss to follow-up; promote HIV prevention; provide appropriate HIV care, and prepare clients for ART. All pre-ART clients should have a medical file/card opened and visits registered to facilitate client tracking. Clients should be seen on a regular basis and any concurrent illnesses managed appropriately.

- Asymptomatic adults (and children over 5 years of age) in pre-ART care should have scheduled 3-monthly follow-up visits with CD4 testing every 6 months. All children below 5 years are eligible for ART and therefore pre-ART care is not applicable. Visits may be more frequent with concurrent medical conditions or borderline CD4.

Table 3-7: Routine Follow-up in pre-ART care

Test/Action	**Purpose**
Repeat CD4 count every 6 months	To see if they have become eligible for ART
WHO clinical staging at every visit	To see if they have become eligible for ART
Perform nutritional assessment at every visit	To ensure good nutritional status
Screen for TB symptoms (at every visit) to identify TB suspects	To identify TB/HIV co-infection, and refer for ART if active TB NB. *Isoniazid Preventive Therapy (IPT) is currently not recommended in South Sudan.*
Check pregnancy status	Refer for ART if pregnant
Offer prevention for HIV positives (PHDP or PwP)	To prevent HIV transmission, re-infection, and prevent STIs. Cater for Reproductive Health (RH) needs.
Provide CPT	To prevent OIs
Provide Insecticide treated mosquito nets (ITNs) for malaria prevention	To prevent malaria Replace once every 24 months
Screen for non-communicable disease and other co-morbidities	For better management of other comorbidities

3.8.1 Retention in care

- Defined as a situation whereby a client has attended the health care clinic within the last 90 days—for medicine collection, laboratory testing, and/or clinical review—and is not documented as having transferred-out, died, or stopped treatment.
- *Key barriers to retention include:*
    - Poor understanding of why it is important to enroll & remain in care
    - Long distance to the clinic & lack of transportation funds
    - Fear of disclosure & stigma
    - Poverty
    - Lack of customer-friendly services at receiving facilities
    - Client re-location or movement
- *To enhance retention in care;*
    - Ensure proper registration with contact information – telephone number, home address
    - Give clients/clients appointments and record in register
    - Counsel clients on disclosure, stigma, etc.
    - Provide clients with a client-held card and counsel on what to do in the event they travel or move elsewhere
    - Provide medical care as needed including timely delivery of lab results or on-site testing
    - Trace clients that have missed appointments, defaulted, or are lost to follow-up (CD4 count).
    - Link clients in care to peer support groups for education and support
    - Decentralize services to help improve access and to minimize transport costs

4 ANTIRETROVIRAL THERAPY FOR ADULTS & ADOLESCENTS

Antiretroviral Therapy (ART) is associated with clinical and HIV prevention benefits, improving survival and reducing the incidence of HIV infection at the community level. ART helps preserve the immune system of PLHIV, reduces the risk of Opportunistic Infections, restores growth (especially in children), and improves mental functioning and overall quality of life.

- ART may be initiated in the ART clinic, in MNCH settings (ANC, maternity, PNC), in the TB clinic, or while a client is hospitalized (in-client). However, all clients on treatment should be actively linked to the ART clinic for chronic care. TB clients may be transitioned to ART after completing anti-TB treatment, and women maybe transitioned from PMTCT to ART 18 months after delivery, when the HIV status of the baby is known. *However, given the limited HR capacity, facilities may provide HIV care and treatment at a single location to serve all PLHIV including adults, children, pregnant women, HIV exposed infants and TB clients.*
- ART initiation should be done at ART accredited health facilities by medical officers, clinical officers, midwives and nurses trained in ART service provision. Follow-up of ART clients may be done at primary facilities and at community level. Refer to 6.3.5 for ART in pregnant and breast feeding women, and 7.3 for paediatric ART.

At enrollment, ART-Eligible clients / clients should have:

1. Clinical evaluation
   - WHO clinical staging 3.2
   - Baseline CD4 cell count - if available
   - Clinical Monitoring HIV disease (History, Physical exam, Lab assessment) 3.1
   - TB screening (refer to Chapter 9
2. Management of HIV related disease 3.5
3. Ongoing provision of basic HIV care
   - Cotrimoxazole Preventive Therapy 3.6
   - Insecticide treated bed net (ITNs) 3.5.1
   - Provider initiated Family Planning 6.2.2
   - Prevention with Positives 3.7
4. Starting antiretroviral therapy 4.2

4.1 ART ELIGIBILITY CRITERIA FOR ADULTS AND ADOLESCENTS

ART eligibility: Adults and Adolescents

- WHO clinical stage III and IV disease regardless of CD4 cell count
- CD4 cell count of ≤500 cells/mm^3 regardless of WHO clinical stage
- ART should be initiated in all individuals with HIV regardless of WHO clinical stage or CD4 cell count in the following situations:
  - Individuals with HIV and active TB disease
  - Individuals co-infected with HIV and HBV with evidence of severe chronic liver disease
  - Pregnant and breastfeeding women with HIV
  - Partners with HIV in sero-discordant couples

As a priority, ART should be initiated in all individuals with severe or advanced HIV clinical disease (WHO clinical stage 3 or 4) and individuals with CD4 count <350 cells/mm^3

4.2 PREPARATION FOR ART

Client preparation prior to starting ART should include baseline clinical and laboratory assessment as well as a psychosocial assessment to ensure the client can achieve optimal adherence once on treatment. Treatment should be initiated within 7 days of a person being found eligible for ART.

- Clinical Assessment: Treat any pre-existing infections as a matter of priority. Remember clients *with TB should be initiated on anti-TB treatment first, then ART within 2-8 weeks*
- Laboratory Assessment: *Lack of access to laboratory tests should not be a barrier to treatment initiation in settings where resources are limited.* Where tests are not available on-site, arrangements should be made to transport specimens to a facility that is able to carry out the tests if possible.

Table 4-1: Baseline Laboratory Tests at ART Enrolment

Lab test	Purpose	Comment
Recommended test(s)		
CD4 testing	As baseline	○ Measurement of CD4% is preferable in children <5 years. ○ If on-site CD4 testing is not available, blood samples should be sent for CD4 cell count testing. ○ CD4 baseline test result is not required for ART initiation for those eligible
Pregnancy screening (+/-test)	To identify women who need referral for ANC	All pregnant women should be referred for ANC care while taking ART
* Screen for TB symptoms (+/- test)	To identify TB/HIV co-infected	In persons who report a positive symptom, the diagnostic test (Sputum smear, GenXpert, or CXR depends on national algorithm. See Figure 13.1 PLHIV diagnosed with active TB should receive ART
Desirable – perform test only if available.		
Renal function: ○ Urine dipstix for glucoce ○ Serum creatinine	To detect renal insufficiency at baseline - particularly for clients starting on TDF containing regimen.	TDF induced renal injury is more common in clients with underlying kidney disease such as cases with long standing hypertension, long standing diabetes, people on concomitant nephrotoxic drugs, and older persons. Urinalysis is also recommended a part of ANC care
Blood Pressure measurement	As baseline	Blood pressure measurement is also recommended as part of ANC care.
HBV testing	To identify TB/HIV co-infected	PLHIV diagnosed with HBV (requiring treatment for HBV) should receive ART as per guidelines (using TDF-3TC of FTC containing regimen)
Do HB or FBC if requires AZT	To detect anaemia or neutropenia,	For clients initiating AZT HB testing is also recommended as part of ANC care
Alanine aminotransferase (ALT)	To exclude liver disease For clients initiating NVP-based regimen	If ALT is high, do not give NVP but use EFV. If ALT is elevated, do Hepatitis B and C surface antigen test, if available or refer.
Serum cryptococcus antigen if CD4 count is ≤100 cells/ml	To detect asymptomatic infection with *cryptococcus neoformans* infection	○ Cryptococcal meningitis is a major cause of death even after ART has been initiated. ○ Prevalence of cryptococcaemia is higher at low CD4 counts. ○ Clients with positive serum CrAg should receive pre-emptive anti-fungal treatment for latent cryptococcal infection ○ Diagnosis and treatment is available at tertiary sites- referral hospitals
Symptom directed lab tests to diagnose pre-existing illnesses:	See management of HIV related diseases 3.5	

*NB : This is a clinical symptom screen, but lab evaluation is recommended if symptomatic

4.2.1 Psychosocial assessment and adherence counseling

The goal of the psychosocial assessment is to identify problems which may impact negatively on the client's health or treatment outcomes and correct them. The preparation of the client for ART should start with baseline counseling to address the following issues:

- *Expected benefits of ART and limitations of ART*
- Importance of adherence to ART, potential barriers and how to improve adherence.
- *Potential side effects of ART and what to do*
- *Possible drug interactions*
- *Follow-up on ART*
- *The importance of food hygiene and proper nutrition.*
- *Sexual and Reproductive Health (RH):*
- For older children and adolescents, disclosure of HIV status
- Clients ' willingness and readiness to start ART

ART adherence counseling:

Poor adherence can lead to development of drug resistance, and subsequent immunologic and clinical failure. Potential or actual barriers to adherence should be identified and discussed with the client during treatment preparation. These may be related to the client/client, the provider, the regimen, or the health system. The client and provider can work together to address and solve barriers related to the individual client and to medications. The table below highlights some of these factors.

Table 4-2 Client Preparation to Start ART and Maintain Adherence

Potential Adherence Barrier	How to address this barrier
Barriers related to the client / client	
○ Poor understanding, misconceptions ○ Stigma and Lack of disclosure of HIV status, lack of social support ○ Depression or other psychiatric diseases ○ Active alcohol abuse ○ Poverty, transport challenges	• Client education, counseling and support • Assisted disclosure • Linkage to Peer & community support groups • Treatment of underlying psychiatric condition (s) • Referral for social support e.g. nutritional support • Co-management of alcohol abuse/substance use disorder • Co-management of mental health disorders • Nutritional support in food insecure settings
Barriers related to medication	
○ Regimen complexity ○ Frequency of dosing ○ High pill burden ○ Food requirements or restrictions ○ Frequency and severity of side-effects	• Use Fixed Dose Combination (FDC) ARVs / Use regimens requiring less frequent dosing i.e. od of bid • Utilise pill boxes especially where client needs multiple drugs • Give clear instructions to clients • Consider client's routine • Use of reminders – IEC can be employed • Do not give unessential medicines • Inform client about possible side effects and what to do in case they occur.

4.3 STANDARDIZED ANTIRETROVIRAL DRUG REGIMENS

The Ministry of Health, Republic of South Sudan has decided on standardized antiretroviral drug regimens in line with the 2013 WHO Guidelines on ART in resource-limited settings. The choice of regimens reflects the imperatives of a public health approach to scaling up of ART. Further, regimen selection took into consideration efficacy, tolerability and opportunities for second line treatment. Fixed Dose Combinations (FDCs) are the preferred formulations for the initial combination treatment in the standardized regimen, and are recommended where available.

Recommendation:
In adults and adolescents, the preferred 1st line regimen is tenofovir + lamivudine (or emtricitabine) + efavirenz (**TDF + 3TC (or FTC) + EFV** as a once daily Fixed Dose Combination (FDC) and should be prescribed for all population groups including adults, pregnant women, clients co-infected with HIV and TB or HBV

Rationale for preferred first line regimen:

- This regimen is simple, effective, and well tolerated.
- Available as a single, once-daily fixed dose combination (FDC), it is easy to prescribe, enhances treatment adherence, and simplifies drug procurement and supply chain management.
- It is safe to use in women of childbearing age whether pregnant or breast-feeding
- Effective against HBV infection, and can be used with anti-TB drugs
- Use of this regimen as 1st line provides for better regimen sequencing and maintains future treatment options
- In areas with high prevalence of anemia like South Sudan, it provides a safe alternative to AZT.
- The regimen has relatively low monitoring requirements.

The list of ARV drugs approved for the treatment protocol in South Sudan is shown in the Table 4-3.

Table 4-3: ARV drugs approved for treatment protocol used in South Sudan

Nucleoside Reverse Transcriptase inhibitors (NRTIs) ○ Zidovudine (AZT) ○ Abacavir (ABC) ○ Emtricitabine (FTC) ○ Lamivudine (3TC)	**Comments** - *Available evidence suggests 3TC and FTC are equivalent in terms of efficacy and safety. 3TC may therefore be substituted for FTC and vice versa* - *Currently 3TC is more available in fixed-dose combination* - *Stavudine (d4T) is in the process of being phased out.*
Nucleotide reverse transcriptase inhibitor ○ Tenofovir Disoproxil Fumarate (TDF)	
Non-nucleoside Reverse Transcriptase Inhibitors (NNRTIs) ○ Nevirapine (NVP) ○ Efavirenz (EFV)	
Protease inhibitors (PI) ○ Lopinavir/Ritonavir (LPV/r) ○ Ritonavir (RTV)	

4.4 ART REGIMENS FOR ADULTS AND ADOLESCENTS

Table 4-4: ART Regimens for Adults and Adolescents: 1st and 2nd Line

First Line ART		
Adult & Adolescents	**Regimen**	**Comment**
All new clients needing treatment, including pregnant women, TB clients , HBV	TDF + 3TC (FTC) +EFV FDC preferred	Replace EFV with NVP in clients with significant psychiatric co-morbidity or intolerance to EFV
Contraindications to EFV	TDF + (FTC or 3TC) + NVP	Use NVP based regimen: In clients with significant psychiatric co morbidity or intolerance to EFV
Contraindication to TDF	AZT+ 3TC +EFV or (NVP)	Renal disease or the use of other nephrotoxic drugs e.g. aminoglycosides
Contraindication to TDF and AZT	ABC + 3TC + EFV (or NVP)	Renal disease and anaemia or the use of other nephrotoxic drugs, aminoglycosides
Currently on d4T-based regimen	TDF + FTC(or 3TC) + EFV FDC preferred	Switch is mandatory if clients experience toxicity and clients who are at high risk of toxicity (high BMI or pregnant). ***Switch to TDF - based regimen even if D4T is well tolerated.***
Adolescents ≤ 35 kg	ABC + 3TC + EFV	ABC maybe used in adolescents (10 to 19 years) ≤35 kg in special circumstances
Second Line ART		
Management of clinical failure	Do CD4 count and viral load	New or recurrent clinical event indicating severe immunodeficiency (WHO stage 4 condition) after 6 months of effective treatment
Management of immunological failure	Confirm with viral load testing	CD4 count falls to the baseline (or below) OR Persistent CD4 levels below 100 cells/ml
Management of virological failure	If confirmed, change to second line ART	If plasma HIV RNA >1000 copies/ml. Check for adherence, compliance, tolerability and drug- drug interaction and assess psychological issues. Repeat VL test 3 months later. If plasma VL confirmed >1000 copies/ml, change regimen to second line therapy
Failing on TDF-based 1st line	AZT+3TC+ LPV/r	Clients with anaemia and renal failure switch to ABC
Failing on AZT based 1st line	TDF +3TC (or FTC) + LPV/r	
Failing on a d4T-based 1st line regimen	TDF+3TC (or FTC) + LPV/r	
Third Line		
Failing any 2nd line regimen	Specialist referral	Clients failing on second line therapy will be managed at tertiary referral centers and the drugs for third line managed centrally

NB: Also refer to summary in Table 13-1

Table 4-5: ARV Adult Dosing Guide

Generic Name	Formulations available	Dose	Comment(s)
Lamivudine (3TC)	Tabs 150 mg	1 tab bd or 2 tabs od	
Abacavir (ABC)	Tabs 300 mg	1 tab bd OR 2 tabs od	ABC maybe used in adolescents (10 to 19 years) ≤35 kg in special circumstances
Zidovudine (AZT)	Tab 300 mg	1 tab bd	Avoid if severe anaemia (Hb<8g/dl)
Tenofovir	Tabs 300 mg	1 tab od	Contra-indicated in renal disease or the use of other nephrotoxic drugs
Efavirenz (EFV)	Tabs 600 mg	1 tab daily	Avoid if active psychiatric disease
Nevirapine (NVP)	Tabs 200 mg	1 tab od for 14 days, then 1 tab bd	Should be used with caution with TB treatment Avoid NVP if CD4 is >250cells/mm3
LPV/r	Tabs LPV 200 mg/RTV 50 mg	1 tab bd	
Fixed Dose Combination ARVs (FDCs)			
TDF/3TC/EFV	Tab: TDF 300mg +3TC 300mg +EFV 600mg	1 tab od	Preferred 1st line regimen for adults and adolescents (including pregnant and lactating women and TB co-infected clients)
AZT/3TC/NVP	Tab: AZT 300 mg + 3TC 150 mg + NVP 200 mg	1 tab bd	
ABC/3TC/AZT	Tab: ABC 300 mg + AZT 300 mg + 3TC 150 mg	1 tab bd	
TDF/3TC	AZT 300 mg + 3TC 150 mg	1 tab bd	
ABC/3TC	ABC 600 mg + 3TC 300 mg	1 tab bd	Alternative regimen in TDF and AZT contraindication
AZT/3TC	AZT 300 mg + 3TC 150 mg	1 tab bd	Alternative regimen in TDF toxicity

4.5 ART FOLLOW-UP

Clients on ART need to be monitored regularly to assess for response to treatment, to identify adherence problems, assess for development of toxicity to ART, and management of inter-current illness. Monitoring of treatment involves both clinical and laboratory assessment.

Key activities at ART follow-up:

- Adherence assessment and counseling - 4.5.2, 4.2.1
- Provision of CPT - 3.6
- PWP counseling (including FP) - 3.7
- Clinical assessment (for ART response, ART adherence, toxicity, IRIS, OIs) - 4.5.1& 4.5.2
- TB screening at every clinical encounter 9.2, Figure 13-1, Figure 13-2
- Lab assessment (for treatment failure, ART toxicity, etc.) - 11.4, 4.5.3
- Substitution of first line ART (if indicated) - 4.5.4

4.5.1 Follow-up schedule for clients on ART

- At the *first scheduled visit (2 weeks* after initiating ART), assess clinical progress; check for drug side effects; assess adherence and counsel as appropriate; check for proper medicine storage; adjust NVP dose.

- Week 4 visit: Manage as above, BUT look out for development of Immune Reconstitution Inflammatory syndrome. If stable, subsequent planned clinical visits should be carried out at *monthly* intervals.

- After 6-12 months following initiation of ART, *clinical* appointments may be scheduled at 2-3 monthly intervals in clients that are clinically stable and adherent to ART.
  - Monthly drug re-fills may be devolved to the pharmacist/pharmacy technician or nurse.
  - Clients should be able to see a clinician in case of any medical problems at scheduled or unscheduled visits.
  - All clients on ART should continue to receive basic HIV care including CPT and ITNs
  - Treat any inter-current infections. Appearance of infections within the first 6 months of treatment does not necessarily indicate treatment failure as the immune system takes time to recover.
  - However, in clients who have been on treatment for > 6 months or who have adherence problems, new clinical conditions should trigger an assessment for possible treatment failure.

4.5.2 Monitoring Adherence to ART

Adherence to ART is a major determinant of treatment success. The optimal level of adherence for durable virologic and clinical success is over 95%. Adherence may be measured by:

- *Pill counts* conducted in clinic or at unannounced home visits.
- *Self-report:* of pill-taking 45ehaviour by the client
- *Pharmacy re-fills records.* This provides information on when clients picked their ARV medications
- *Viral load monitoring:* this is however not readily available in real time

4.5.3 Laboratory testing during ART follow-up

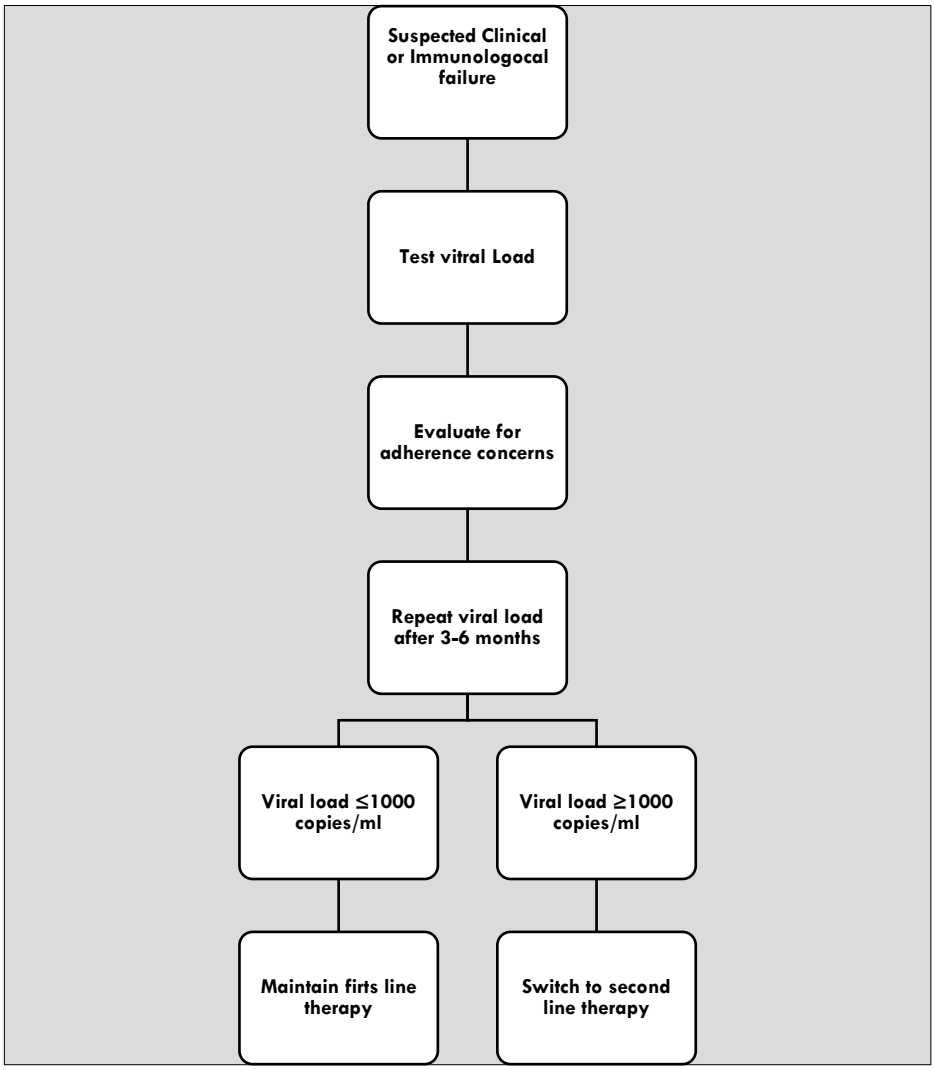
This is important for assessment of (a) ART response, (b) diagnosis of treatment failure, and (c) detection of ARV drug toxicity. See Table 4.6 for lab testing during ART follow-up.

- For assessment of treatment response, CD4 cell count should be performed 6-monthly.
- When compared to CD4 monitoring, viral load monitoring provides an early and more accurate indication of treatment failure and the need to switch to second line treatment. However, due to the limited availability of viral load testing in South Sudan, CD4 count (every 6 months) and clinical monitoring should be utilized to diagnose treatment failure, with targeted viral load testing to confirm treatment failure. See Figure 4-1
- For toxicity see 4.5.4 and Table 12-3

Table 4-6: Laboratory Testing During ART Follow-Up

Test	Purpose	Comment
Recommended tests		
CD4 every 6 months	To monitor immune response to ART	An increase of 100-150 CD4 cells/mm3 in the first 6-12 months is typically seen in an ARV drug-naïve, adherent client
VL only if treatment failure is suspected see Figure 4-1	To confirm treatment failure	Initiate 2nd line if treatment failure is confirmed Table 4-4 and Table 12-1
*TB Screening		*This is a clinical symptom screen, but lab evaluation is recommended if symptomatic
Desirable tests – only performed where available		
ALT only if on NVP and develops rash or symptoms of hepatitis	To identify NVP toxicity	See table below on what to substitute in case of toxicity Table 4-8 & Table 12-3
FBC at month 1, 3 and 6 if on AZT	To identify AZT toxicity	
Creatinine - if client had signs or symptoms of renal failure	To identify TDF toxicity	if client had signs or symptoms of renal failure
Fasting cholesterol and triglycerides at month 3 if on LPV/r , if available	To identify LPV/r toxicity	

Figure 4-1: Algorithm for targeted viral load testing



- If HIV RNA is over 1000 copies/ml in clients suspected to have treatment failure, adherence concerns should be addressed, and viral load testing repeated after 3 months. If still over 1000 copies/ml, then switch to second line and re-test by 4 to 8 weeks until suppression to <200 copies/mL, then every 3 to 6 months.

    - Clinical failure is suspected when an adult or adolescent develops a WHO stage 4 condition after 6 months of effective ART.
    - Immunological failure in adults is defined as a fall in CD4 cell count to baseline (or below) or persistent low CD4 below 100 cells/mm^3

4.5.4 Monitoring and substitutions for ARV drug toxicities

Toxicity to ARVs can be monitored clinically based on the client report and physical examination. It can also be assessed by a limited number of laboratory tests. There are 3 categories of drug toxicities:

- Mild toxicities do not require ART discontinuation or drug substitution; give symptomatic treatment
- Moderate or severe toxicities may require drug substitution, but do not require discontinuation of all ART. See Table 4-7 below.
- Severe life-threatening toxicities require discontinuation of all ARVs and initiation of supportive therapy until the client is stabilized and the toxicity is resolved

For additional information on toxicities, refer to Table 12-3. Regardless of severity, adverse reactions may affect adherence. Before initiating ART, it is important to discuss potential side effects. During the early stages of treatment, offer support during minor and moderate adverse reactions.

Table 4-7: Major Toxicity Substitutions for 1st and 2nd Line Regimens

ARV	ABC	TDF	AZT	NVP	EFV	LPV/r
Toxicity	Hypersensitivity reaction	Renal dysfunction	Anemia, Mitochondrial toxicity	Hepatotoxicity, skin rash, and hypersensitivity reactions	Persistent CNS toxicity	Severe diarroea or Metabolic syndrome
Suggested substitution	1st line: TDF or AZT 2nd line: TDF	1st line: AZT or ABC 2nd line: ABC	TDF or ABC	EFV	NVP	Refer

TDF toxicity

- TDF use may be associated with increased risk of renal dysfunction.
- However, lab monitoring is not mandatory to initiate TDF treatment. Testing renal function at baseline is desirable for clients who are at increased risk of TDF toxicity to detect and limit renal impairment (older people, low BMI<18.5, body weight<50kg, untreated Diabetes mellitus, untreated hypertension, clients with underlying renal disease, concomitant use of boosted PIs and nephrotoxic drugs).
- Routine blood pressure monitoring may be used to detect hypertension. *Where available*, serum creatinine may be performed for high risk clients (older, underlying renal disease, long term diabetes mellitus, long standing hypertension, concomitant nephrotoxic drugs or PIs). Urine dipstix may be used to detect glycosuria or severe TDF nephrotoxicity in individuals without diabetes using TDF-containing regimens.
- Do not initiate TDF in clients with long-term diabetes, uncontrolled hypertension, and renal failure, or when the estimated GFR rate is <50 ml/min.
- Children on TDF should have regular growth monitoring

Efavirenz (EFV)

- The CNS side effects associated with use of EFV typically resolve within weeks. If persistent, then NVP could be substituted. Of note, there is no increase in incidence of birth defects for 1st trimester EFV exposure.

Zidovudine (AZT)

- Associated with increased risk of hematological toxicity. It is desirable to perform Hb estimation before initiating ART especially among adults and children with low body weight, low CD4 counts, and advanced HIV disease. In individuals with severe anemia <7 g/dl, AZT should be avoided as first line therapy.

Nevirapine (NVP)

- It is desirable to monitor liver enzymes in women with HIV who have CD4 ≥ 250 cells/mm^3, and individuals co-infected with HBV or HCV.

4.6 WHAT TO EXPECT IN THE FIRST SIX MONTHS ON ART

The first six months on ART are critical. A majority of ART recipients respond well with increases in CD4 cell count; however, some fail to respond as expected. Possible events during this period include;

4.6.1 CD4 Recovery

- In the majority of clients initiated on ART, the CD4 count rises as the immune system recovers. Rises of over 100-150 CD4 cells/ mm^3 are expected in the first 6-12 months in the ARV naïve, adherent client with drug susceptible virus. The response often continues in the subsequent years.
- However severe immunosuppression may persist in a small number of clients and low CD4 cell counts persist. This is more common in clients that initiate ART at very low CD4 cell count.
- Failure to achieve some CD4 recovery should alert the providers to potential adherence problems or primary non-response to ART.

4.6.2 Immune Reconstitution Inflammatory Syndrome (IRIS)

IRIS is an over-aggressive response of the body's defense system caused by a sudden recovery on ART. IRIs occurs in about 10-30% of people initiating ART and usually within the first 4-8 weeks. IRIS is more common among clients with low CD4 counts at ART initiation, disseminated OIs or tumors at initiation, and shorter duration of therapy for the OIs prior to ART.

- May present as *paradoxical IRIS* whereby there is worsening of an opportunistic infection or tumour that was initially responding. Unmasking IRIS, occur when ART initiation triggers disease that was not initially apparent before ART. BCG associated IRIS (localized or systemic) may occur in HIV infected infants following immunization. The most serious and life threatening forms of paradoxical IRIS are for TB, cryptococcal meningitis, Kaposi's sarcoma, hepatitis, and herpes zoster.

- IRIS should only be considered if the more common causes for worsening have been ruled out

- Management of IRIS:
  - Confirm that ART is actually taken as prescribed – check adherence
  - Continue ART if ARV drug toxicity has been ruled out as the underlying cause, and support adherence
  - Treat the Opportunistic Infection (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 non-steroidal anti-inflammatory drugs and/or prednisolone should be given

- To reduce the risk of developing IRIS, ensure earlier diagnosis and initiation of ART before CD4 falls below 200 cells/ mm^3, improve screening for OIs before ART especially TB and cryptococcus, and properly manage OIs before ART initiation. Specific advice on concomitant TB and HIV treatment is given in chapter 8. For Cryptococcus infection, see recommendation on screening t and pre-emptive therapy. See 3.5.4 and Table 3-5.

4.6.3 Toxicity

- **See section 4.5.4**

4.7 TREATMENT FAILURE

- Treatment failure is when ART stops controlling an individual's virus and he/she starts getting sicker. Poor adherence to ART is the commonest cause of treatment failure.
- Whenever treatment failure is suspected, verify if client has been on ART for at least 6 months, has been adherent to the regimen, intercurrent illness has been treated, IRIS has been excluded, and in children, inadequate nutrition is excluded (if considering changing treatment because of growth failure).
- There are 3 criteria for treatment failure; clinical, immunologic, and virological. Virological failure is the most accurate method and is defined as a persistently detectable viral load exceeding 1,000 copies /ml (i.e. Two (2) consecutive viral load measurements within a three-month interval, with adherence support between measurements) after at least 6 months of using ARV drugs.
- Once treatment failure has been detected, select and switch the client to a new regimen as per Table 4-4 for adults and adolescents or Table 12-1.
- Counsel client on the new ART regimen- highlighting reasons for change in regimen, differences in drug type, dosing of ARVs, timing of administration, possible side effects, importance of adherence, and on-going support.

Table 4-8: Clinical, Immunological and Virological Failure in adults

Failure	Definition	Comments
Clinical failure	**Adults and adolescents** • New or recurrent clinical event indicating severe immunodeficiency (WHO stage 4 condition) after 6 months of effective treatment. Must exclude immune reconstitution syndromes.	Must be differentiated from IRIS occurring after ART initiation.
Immunological failure	**Adults and adolescents** • CD4 count falls to the baseline (or below) or • Persistent CD4 levels below 100 cells/ml	Without concomitant or recent infection, to cause a transient decline in CD4 cell count.
Virological failure	Plasma viral load above 1000 copies / ml based on two consecutive viral load measurements after 3 months, with adherence support . Rifer to Figure 4-1	An individual must be taking ART for at least 6 months before it can be determined that a regimen has failed.

4.8 SECOND LINE ART FOR ADULTS AND ADOLESCENTS

- Second-line ART for adults and adolescents should consist of two NRTIs and a ritonavir-boosted PI. The preferred boosted PIs for second line therapy is LPV/r
- After failure of a TDF based first-line regimen, use AZT+3TC (or FTC) as the NRTI backbone in second line regimens. After failure of an AZT-based or d4T –based first line regimen, use TDF as the backbone in the second line regimen. See Table 4-4 and Table 12-1 on ART regimens.

4.9 THIRD LINE ART: SALVAGE THERAPY

- ART switch from second to third line should be guided by results of HIV drug resistance testing. In the absence of ART resistance, 3rd line regimens should include new drugs with minimal risk of cross resistance to previously used regimens. There is currently limited evidence to support specific recommendations for 3rd ART options. **Recommendation:** *Clients on a failing second-line regimen with no new ARV options should continue with a tolerated regimen.*

4.10 BUILDING CAPACITY FOR ART SERVICE DELIVERY:

As of June 2014, there was differential decentralisation of HIV services with ART available at 22 sites, countrywide, PMTCT at 75 sites, and TB services at 65 sites. To ensure access to comprehensive HIV prevention, care and treatment services, a number of strategies will be adopted including services integration, enhanced referral linkages, and accreditation of additional sites.

- *Site accreditation for ART delivery and decentralisation of services:* ART services will be scaled up from 22 sites to 80 sites by 2017; with priority for site accreditation given to regions with higher HIV burden, and existing PMTCT and TB sites to support roll out of Option B+ and enhance linkage to ART. In the long term, it is envisaged that ART will be available at all teaching hospitals (3), state hospitals (10), and county hospitals (79) and selected PHCC – Primary Health Care Centers.

- *Enhanced referral/linkage*: In the short term, facilities without ART on site will rely on strong linkages and referral to ensure access to treatment for eligible clients. ANC sites (without ART) will provide PITC and refer HIV –positive clients to ART sites. TB sites will provide PITC, and for the HIV infected provide CPT and refer for ART.

- *Integration:* Whenever possible, services should be integrated: All ART and HIV care sites should be able to provide TB screening, TB evaluation services, and TB therapy on site. Clients with TB and HIV should initiate treatment for both TB and ART in the TB clinic and transition to ART clinic after completing treatment. For PMTCT, mothers should transition from MCH to ART after the baby has made 18 months of age and the HIV status is established.

5 ADOLESCENT HIV CARE AND SUPPORT

Adolescents Living with HIV (ALHIV) are in the age category 10-19 years. There are 2 groups of ALHIV: a) adolescents who acquired HIV prenatally, and b) adolescents who acquired HIV during childhood or adolescence. Adolescents are often underserved with poor access to and uptake of HIV testing and counselling and linkage to prevention and care services. Adolescents need special attention because of the unique health, psychological, and social needs. See some of the major challenges in Table 5-1 below.

Table 5-1: Challenges of Adolescents Living with HIV (ALHIV)

Common challenges faced by all ALHIV	***Challenges of adolescents with perinatally acquired HIV***	***Challenges of adolescents who acquired HIV during childhood or adolescence (through sexual intercourse, sexual abuse, blood transfusion etc)***
• Poor retention in care /high loss to follow-up • Poor adherence to ART • Positive living and positive prevention • Stigma and discrimination • Finding a partner/ and starting a family	• Disclosure of HIV status to the child • Mother's acceptance of her HIV status • For the family: Demands of caring for a child/adolescent with chronic HIV infection • Complexity of living in a home affected by HIV, particularly if caregivers are unwell, unemployed or have died	• Acceptance of HIV status • Disclosure to family, partners, and peers • If raped or abused, dealing with emotional and physical repercussions of that experience

The package of adolescent HIV care and treatment services includes:

- HIV clinical care (HTC, ART, Pre-ART care, TB care, PMTCT) 5.21
- Counseling and psychosocial support (including disclosure) 5.2 and 5.3
- Sexual and reproductive health services 5.4
- Family planning and PMTCT services for ALHIV 5.5
- Retention, adherence and disclosure support 5.6
- Youth-friendly services 5.7
- Support for the transition to adult care 5.8
- Community linkages including peer-based activities

5.1 CLINICAL CARE FOR ADOLESCENTS LIVING WITH HIV (ALHIV):

Clinical care (HTC, ART, Pre-ART, TB) for ALHIV is generally similar to that of adults. Of note;

- HTC (including disclosure): adolescents should be counseled about the potential benefits and risk of disclosure of their HIV status. They should be empowered and supported to determine if, when and how to disclose. All adolescents should be disclosed to about their HIV status and the HIV status of their parents/guardians. Also see 2.3.3

- ART services: The treatment recommendation for adolescents with weight ≥35kg is the same as that for adults while for adolescents weighing <35kg it is the same as that for children 3-9 years. In order to support retention in care and adherence to ART, health care workers must be trained to understand the adolescent population and to encourage them to utilise the HIV services.

5.2 COUNSELING AND PSYCHOSOCIAL SUPPORT NEEDS OF ADOLESCENTS:

Adolescents have unique psychosocial needs different from those of children and adults. ALHIV may require extra support in several areas including:

- Understanding and coming to terms with their HIV status and that of family members
- Grieving the illness and loss of family members with added responsibilities
- Coping with cycles of wellness and ill health
- Long term adherence to treatment
- Sexual and reproductive health
- Anxiety over physical appearance and body image
- Developing self-esteem, confidence, and sense of belonging
- Dealing with stigma, discrimination and social isolation
- Accessing education, training, and work opportunities
- Managing mental health issues

5.3 DISCLOSURE AND ALHIV:

- Disclosure is an ongoing process of:
    - Telling a child / young adolescent that he or she has HIV,
    - Helping him / her understand what it means,
    - Helping him/her disclose his or her HIV status to others
- Disclosure can help young clients access HIV services. It can also improve adherence, reduce stigma and discrimination, and reduce HIV transmission by helping people protect themselves and their partners.
- Health workers should assess clients and caregivers readiness, work with the caregiver to develop and follow a disclosure plan, prepare the client for different stages in the disclosure process, and support the client and caregiver throughout the process.

5.4 SEXUAL AND REPRODUCTIVE HEALTH SERVICES FOR ADOLESCENTS:

- Support ALHIV to practice safer sex to protect themselves and their partners from HIV, STIs and unwanted pregnancy. Because ARVs reduce the amount of virus in body fluids, safe sex includes maintaining excellent adherence to ART.
- Sexually active adolescents should be screened for STI symptoms, and managed in accordance with national STI guidelines.

5.5 FAMILY PLANNING AND PMTCT SERVICES FOR ALHIV:

Adolescent pregnancy is associated with many health risks (pregnancy complications), and psychosocial risks (stigma, changes in education, career, or marriage aspirations).

- Health care workers should counsel ALHIV on the safest times to have children in the future; they should wait until they are adults (due to the risks of adolescent pregnancy), get pregnant when healthy, when CD4 cell count is high (>500), and when adherent to ART.
- ALHIV have high family planning discontinuation rates and are less tolerant of contraceptive side effects. Counsel all clients on correct condom use, whether condoms are their primary contraceptive choice or whether they will be used for dual protection.
- Provide counseling on PMTCT and refer all pregnant ALHIV to ANC for PMTCT services.

5.6 SUPPORTING RETENTION & ADHERENCE TO CARE & TREATMENT FOR ALHIV

- Ensure services are 'youth friendly' –See 5.7
- Provide counseling and education including adherence preparation support to all ALHIV and their caregivers
- Ensure linkages to peer support groups
- Use appointment systems: send sms reminders where possible
- Ensure tracking system is in place: follow–up clients who miss clinic appointments - by phone, sms or home visit
- Use Fixed Dose Combination ART regimens

5.7 YOUTH FRIENDLY SERVICES

Barriers to services' uptake by youth include cost, disapproval by providers and the community, logistical constraints (including inconvenient hours or lack of transportation), fears about violations of confidentiality, uncertainty, embarrassment, or lack of awareness. Stigma keeps many young people living with HIV from receiving the treatment they need. Youth-friendly services (see characteristics below) aim to overcome these barriers to accessibility and use.

<table>
<tr>
<td rowspan="3">Programmatic Characteristics

• Package of essential services available
• Sufficient supply of commodities and drugs
• Range of contraceptives offered
• Referrals available
• Affordable fees / free services
• Waiting time not excessive
• Youth are involved in program design
• Both boys and girls are welcomed and served
• Unmarried clients are welcomed and served
• Educational material is available on-site
• Services are well promoted in areas where youth gather
• Linkages are made with schools, youth clubs, and other youth-friendly institutions</td>
<td>Health Facility Characteristics
• Convenient hours
• Separate space and/or hours for youth
• Convenient location
• Adequate space
• Privacy ensured
• Comfortable setting</td>
</tr>
<tr>
<td>Service Provider Characteristics
• Competent staff / trained in adolescent issues
• Respect for youth
• Privacy and confidentiality are ensured
• Adequate time is given for client-provider interaction
• Peer counselors are available</td>
</tr>
<tr>
<td>Youth Perceptions of the Program
• Privacy is maintained at the facility
• Confidentiality is honored
• Youth are welcome regardless of marital status
• Boys and young men are welcome
• Service providers are attentive to youth needs</td>
</tr>
</table>

5.8 SUPPORTING THE TRANSITION TO ADULT CARE:

After a certain age, all ALHIV attending pediatric clinics have to transition to the adult HIV clinic. The goal of transition is to ensure provision uninterrupted, coordinated, and developmentally and age-appropriate services.

- Healthcare workers should support ALHIV become more independent in managing their care. In addition, providers should also support caregivers to understand their changing role. To help ALHIV prepare for transition, ensure the client understands the illness and its treatment, promote linkage to adolescent peer and other support groups at the adult clinic.

6 PREVENTION OF MOTHER TO CHILD HIV TRANSMISSION (PMTCT) AND IMPROVING MATERNAL, NEWBORN AND CHILD HEALTH (MNCH)

Globally, 90% of children get HIV from mothers during pregnancy, childbirth and breastfeeding. Without intervention, the overall MTCT transmission rates range from 15-35%. The goal of eMTCT is to ensure HIV-free survival of children born to women living with HIV and keeping mothers healthy. Services to prevent mother to child transmission may should be provided before pregnancy, during pregnancy (in ANC), during labour, or and during the breastfeeding period. This chapter outlines the PMTCT services for the mother while interventions for the infant are detailed in Chapter 7&8.

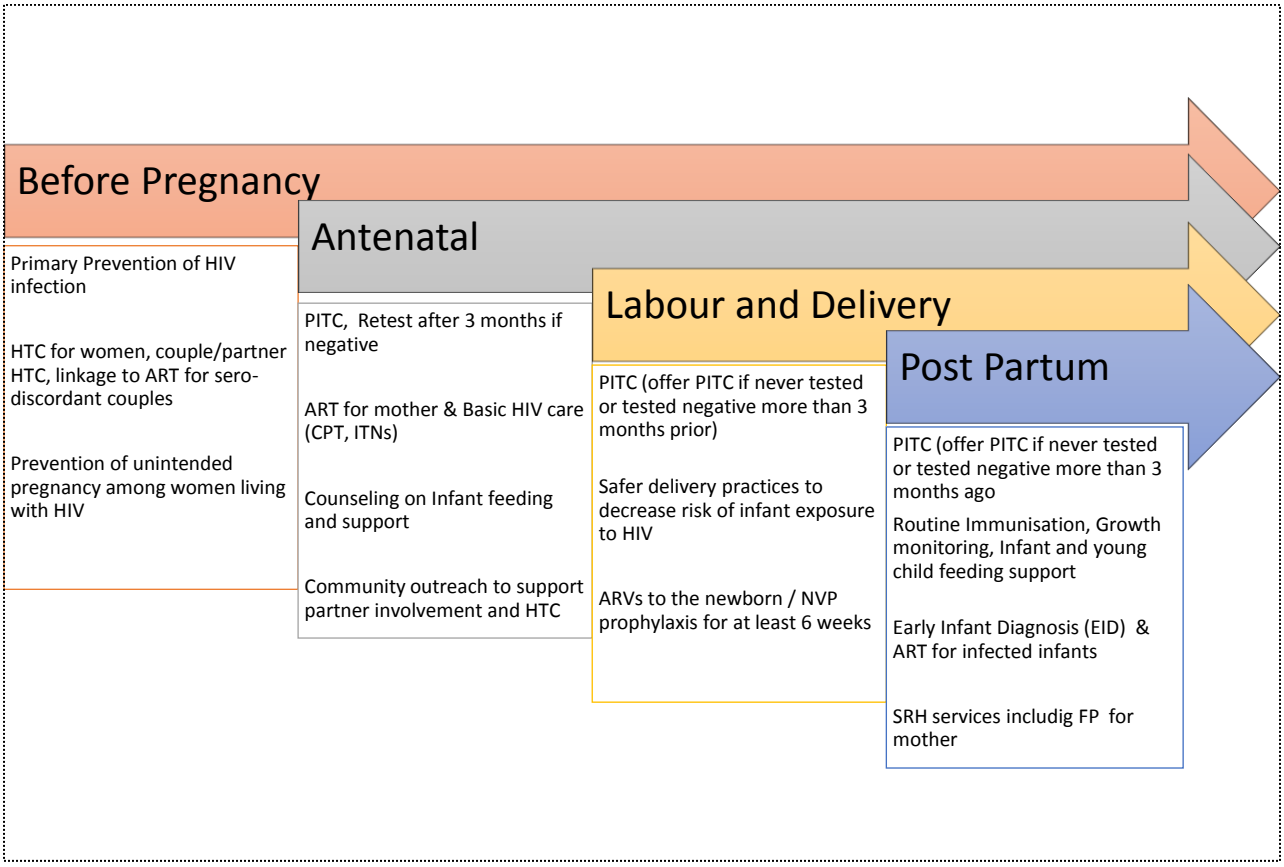
6.1 THE PMTCT PRONGS

Prevention or elimination of mother-to-child transmission of HIV (PMTCT) comprises of a package of interventions summarized as 4 prongs, which must be implemented simultaneously. See Table 6-1 below:

Table 6-1: The PMTCT Prongs

Element	Target group	Additional information
Prong 1: Primary prevention of HIV infection	Women and men who are sexually active including adolescents	This element aims to prevent men and women from contracting HIV. Interventions include: ○ Health information and education ○ HIV testing and counselling - regular retesting for those with exposure ○ Couple counselling, partner testing, and linkage to care & treatment for the HIV-infected ○ Safer sex practices, including dual protection (with condom use) ○ Delay of onset of sexual activity ○ Behavioural change communications to avoid high risk behaviour
Prong 2: Prevention of unintended pregnancies among women living with HIV	Women living with HIV	○ FP counselling & services to ensure women can make informed decision about their RH ○ HTC in RH/FP services and linking those found to be HIV-positive into care and treatment ○ Safer sex practices, including dual protection (condom promotion)
Prong 3: Prevention of HIV transmission from women living with HIV to their infants	Pregnant women living with HIV	This element focuses on: ○ Quality antenatal, delivery, and postpartum care ○ Access to HTC during ANC, labour and delivery, and postpartum period. ○ ART for all pregnant and breast-feeding women living with HIV ○ Provision of ARV prophylaxis for HIV-exposed infants for at least 6/52 ○ Safer delivery practices to decrease risk of infant exposure to HIV ○ Infant feeding information, counselling and support ○ Community outreach and efforts to support partner involvement & HTC
Prong 4: Provision of treatment, care and support to women infected with HIV, their children, and their families	Women living with HIV and their families	This element addresses the treatment, care and support needs of HIV-infected women, their children and families. **Package of services for mothers includes:** ○ ART ○ Co-trimoxazole prophylaxis ○ TB screening and treatment ○ Continued infant feeding counselling and support ○ Nutritional counselling & support ○ SRH services including FP ○ Psychosocial support ○ PHDP ○ Linkage with community support systems for PLWH including OVC services **Package of services for HIV-exposed children:** ○ ARV prophylaxis for 6 weeks (NVP) ○ Routine immunization & growth monitoring ○ Co-trimoxazole prophylaxis from 6 weeks of age ○ EID for HIV at 6 weeks OR Ab testing at 18 months ○ Continued infant feeding counselling and support ○ Screening and management of tuberculosis ○ Prevention and treatment of malaria ○ Nutrition care and support ○ Psychosocial care and support ○ Regular re-assessment of HIV status & ART eligibility ○ Symptom management & palliative care if needed. ○ Linkage with community support systems for PLWH including OVC services

Figure 6-1: The PMTCT Continuum of Services



6.2 BEFORE PREGNANCY

6.2.1 Primary Prevention of HIV infection among women (Prong 1)

- *Implemented at general population level*
- *Activities include: Behavioral Change Communication (BCC) and promotion of safer sex;* HIV testing and Counseling (HTC); couple HTC; partner testing and treatment of all sero-discordant couples; delay of onset of sexual activity; condom use
- PMTCT messages should be incorporated in school health curricula, community adolescent health programs, and pre-marital counseling programs

Recommendations:

- PITC *is recommended for women as a routine component of the package of care in all antenatal, childbirth, postpartum, and infant/pediatric care settings.*
- Pregnant women who have tested HIV-negative in the 1st or 2nd trimester of pregnancy should be re-tested in the 3rd trimester (preferably between 28-36 weeks), or during labour, or shortly after delivery, because of the high risk of acquiring HIV during pregnancy.

6.2.2 Prevention of unintended pregnancy among women living with HIV (Prong 2)

Family planning among women living with HIV reduces the number of unintended pregnancies, thereby reducing the number of infants exposed to HIV and the overall risk of MTCT.

6.2.2.1 Provider Initiated Family Planning (PIFP)

Key message on Provider Initiated Family Planning:

- Avoid unwanted and /or unintended pregnancies, regardless of HIV infection status
- Unprotected sex is a risk for discordant and concordant HIV infected couples
- Couples should use dual protection – condoms alone are not enough for family planning as they have to be used very consistently
- Women living with HIV should use a family planning method of their choice as long as it is safe with ART. See table 6-2. *Depo-Provera has fewer interactions with ART and anti TB therapy.*
- Encourage women living with HIV to make an informed choice about pregnancy. HCW should inform women that they can have a safe pregnancy and minimize the risk of HIV transmission to the baby if the mother;
    - Starts ART as early as possible, preferably before becoming pregnant
    - Is fully adherent to ART throughout pregnancy and breastfeeding

A. *Counsel women on FP routinely when they come for ANC, PNC, ART services.*
Encourage HIV-infected women to discuss their RH options and support them as appropriate. Information provided during counseling should cover;
- Family planning methods, advantages, and side effects.
- Common misconceptions about family planning
- Advantages of dual protection and also how to negotiate for condom use.
- Use of contraception is voluntary
- What to do when pregnancy occurs

B. Following counseling, offer FP.

I. For HIV-positive women and couples who desire children, discuss strategies to reduce the likelihood of HIV transmission to infants and sexual partners.

II. Where pregnancy is not desired, offer effective contraception.
- Encourage dual contraception (use of both hormonal contraception and condoms) to prevent pregnancy; prevent STIs, HIV transmission, and re-infection.
- The choice of contraceptive methods in HIV infected women is much the same as in HIV negative women. See Table 6-2

Table 6-2: Available Family Planning Methods

Method	How to use	Effectiveness (pregnancies per 100 women)	Common side-effects	Considerations if HIV-positive
Short Term Methods				
Male condom	Use every time you have sex	Highly effective when used correctly each time (2 pregnancies/ year) Less effective as commonly used (15 pregnancies/year)	None	Condoms are the only contraceptive method that protects against STIs and HIV
Female condom	Use every time you have sex	Effective when used correctly each time(5 pregnancies/year) Less effective as commonly used(21 pregnancies/year)	None	Condoms are the only contraceptive method that protects against STIs and HIV
Oral contraceptive pills	Take a pill every day	Highly effective when used correctly(<1 pregnancy /year) Less effective as commonly used (8 pregnancies/year)	Menstrual changes, spotting, headaches, nausea	HIV-positive women and women on ART should use pills in combination with condoms (dual protection)
Injectables	Get an injection every 1, 2, or 3 months	Highly effective when used correctly (<1 pregnancy/year) Less effective as commonly used (3 pregnancies/year)	Spotting initially or continuously, and sometimes no bleeding	HIV-positive women and women on ART should use injectables in combination with condoms (dual protection)
Emergency contraceptive pills	Take within 5 days after condom breakage/ other unprotected sex	Reduces chances of pregnancy from that one act of unprotected sex to 1/4 or 1/8 of chances if not used	Nausea	Not as effective as other methods for regular use
Long-acting methods				
Implant, IUD, vasectomy, female sterilization	○ Provide long-term, highly effective contraception (<1 pregnancy per 100 women per year) and can be used by women with HIV. ○ Vasectomy and female sterilization are permanent methods, for couples or women who know they will not want more children. ○ Use in combination with condoms for dual protection. ○ These methods require a procedure performed by health care provider.			

6.3 DURING PREGNANCY

Key activities:

- Provider – Initiated Testing and Counseling 2.4 , Partner testing & Couples HTC 6.3.1
- Lab investigations and related ANC services 6.3.2
- Comprehensive care for pregnant women with HIV - Section 3
- Risk reduction counseling 6.3.4
- Antiretroviral therapy 6.3.5

6.3.1 PITC in ANC, Partner testing, and Couple testing

- Couple testing and Partner testing should be offered in ANC with support for mutual disclosure. Providing HTC to partners improves support for adherence to health care interventions including ART. All HIV positive sero-concordant and sero-discordant couples should be linked to ART.
- For HIV negative pregnant women, re-testing is recommended in the third trimester, or during labour, or shortly after delivery, because of the high risk of acquiring HIV infection during pregnancy.
- Women who are not ready to test for HIV during the visit should be engaged at subsequent visits.

6.3.2 Laboratory investigations and related ANC services

- For all pregnant women (regardless of HIV status), screen and treat for the following conditions: syphilis, HIV, anemia, urinary tract infections, in addition to performing a blood group test.
- Perform a baseline CD4 count if available. The test result is not a pre-requisite for ART initiation.
- Nutrition assessment, counseling, and support: counsel mothers on appropriate feeding practices. Counsel mothers to exclusively breastfeed for six months and continue breastfeeding with the addition of complementary foods through at least 12 months
- Provide iron, folic acid and multivitamins for supplementation
- Deworm during the second trimester of pregnancy – single dose mebendazole 500 mg
- Provide tetanus vaccination

6.3.3 Comprehensive care for pregnant women with HIV

- Pregnant and breastfeeding women should receive the same care and treatment services as other HIV+ adults.
- Pregnant women on CPT should NOT be given Fansidar for intermittent preventive treatment for malaria

6.3.4 Risk reduction counseling and support during pregnancy, delivery and breastfeeding

- Encourage consistent and correct condom use for both HIV positive and HIV negatives at risk of infection
- Encourage women to deliver at the health facilities
- Immediately after delivery, all mothers should receive vitamin A 200,000 IU supplementation –irrespective of HIV status

6.3.5 Antiretroviral therapy for pregnant and breast-feeding women

Key Recommendations:

- All women living with HIV that are identified during pregnancy, labour or while breastfeeding should be started on lifelong ART (option B+) irrespective of CD4 counts or WHO clinical stage.
- A once-daily fixed dose combination of TDF+3TC (or FTC) +EFV is recommended as the first line ART regimen in for pregnant and breastfeeding women, including pregnant women in the first trimester of pregnancy and women of childbearing age. See Table 6.3
- Pregnant and breastfeeding women living with HIV should be provided with the same HIV care and treatment services as other adults receiving ART.
- HIV-positive mothers and their HIV-exposed or –infected children should be provided services together at the same location.

Why lifelong ART for pregnant and breastfeeding women?

- ART prevents further disease progression in the mother, with reduction in maternal HIV-related deaths, opportunistic infections especially TB, and improved survival of their children.
- ART reduces viral load in blood and breast milk thus greatly reducing the risk that the exposed child will get infected with HIV. This makes breast feeding safer, and contributes to child survival.
- Giving the mother ART avoids the need for extended infant ARV prophylaxis.
- Lifelong ART in the mother protects the current pregnancy as well as subsequent pregnancies
- Maternal ART reduces risk of HIV transmission to HIV-negative partners in sero-discordant couples.
- Operationally, it is easier to implement lifelong ART than using CD4 count criteria

Table 6-3: 1st Line ART Regimens for Pregnant & Breast Feeding Women & HIV-Exposed Infants

Client	Regimen	Comment
Maternal Regimens **NB: See Table 4-1 for baseline recommended lab tests at ART enrollment**		
Pregnant and breastfeeding women initiating ART (at ANC, in labour, or post-partum, or in post-natal period)	TDF + 3TC (or FTC) +EFV as a Fixed Dose Combination (FDC)	ART should be started as early as possible in pregnancy. Alternative regimens for specific toxicities or side effects can be found in 4.4 Adherence counseling (see 4.2.1) should be expedited and women initiated on ART if agreeable. If a woman declines ART, a follow-up plan including ongoing counseling and active client tracing should be made with the goal of initiating ART at subsequent visit. Ongoing adherence counseling at the visits following ART initiation
Pregnant or breastfeeding women already on ART	Continue current ART regimen	Client may be switched to TDF-3TC-EFV if single FDC preferred If client has evidence of treatment failure, follow guidance for evaluation of treatment failure in 4.7
Infant regimens		
Mother on lifelong ART	NVP at birth and then daily for 6 weeks	If mother is breastfeeding and not virally suppressed e.g. late booking or established poor adherence, continue NVP for infant throughout breastfeeding until one week post cessation of breastfeeding
Infant whose HIV positive mother is not on ART	NVP as soon as possible and daily for 12 weeks i.e. extended NVP prophylaxis	Initiate ART for mother Assess ART eligibility for infant as per infant testing algorithm (EID at 6 weeks, ART if HIV-infected.
Infant < 18m with unknown maternal status because orphaned or abandoned	Test infant with rapid HIV test. If positive continue NVP for 6 weeks. If negative discontinue NVP	Follow up at 4-6 weeks with HIV PCR. If PCR is unavailable, do HIV antibody test at 9 months and at 18 months
* If the mother received option A regimen i.e. f or women not qualifying for ART, given AZT starting as early as 14 weeks gestation; at onset of labour, sdNVP and first dose of AZT/3TC; Postpartum: daily AZT/3TC through 7 days postpartum)	Give NVP at birth and daily for 6 weeks Test infant with 4-6 week HIV PCR test. If negative and breastfeeding continue NVP till one week after complete cessation of breastfeeding	Initiate ART for mother

* It is anticipated that a few women will have received Option A for PMTCT since South Sudan is transitioning from implementation of PMTCT option A to Option B+.

6.4 LABOUR AND DELIVERY

Key steps

- Ascertain HIV status, offer PITC if never tested or tested negative more than 3 months ago. see 2.4
- Give ART: for mothers on treatment, continue the same ART regimen. Initiate ART for mothers not yet on treatment and consider extended ARV prophylaxis for the infant. see 6.3.5
- Ensure safe obstetric practices – 6.4.1
- ARV prophylaxis for the new born – 6.4.2

6.4.1 Safe obstetric practices

***To reduce obstetric risk of HIV transmission*:**

- *Use a partogram* to allow for early detection and management of prolonged labour. Prolonged labour increases the number of hours the baby is exposed to maternal blood and secretions in the birth canal.
- *Avoid routine (artificial) rupture of membranes (ARM).* If prolonged labour is due to poor uterine contraction, perform ARM at ≥6cm cervical dilation and augment with oxytocin (pitocin)
- *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*
- *Actively manage the third stage of labour:* Active management reduces risk of postpartum haemorrhage which increases exposure of the newborn to maternal blood. This involves 3 important components: (i) *Giving oxytocin* within 1 minute following the birth of the baby (ii) *Delivery of the placenta using controlled cord traction (iii) Massaging the uterus after delivery of the placenta*

NB: *HIV infection in a pregnant woman is in itself no longer considered an absolute indication for Caesarean section. Caesarean section is therefore not recommended specifically for HIV infection in South Sudan; rather it is recommended for obstetric and other medical reasons.*

6.4.2 ARV prophylaxis to the newborn

For breastfeeding infants, give six weeks of infant NVP. Extended duration of infant prophylaxis beyond 6 weeks may be considered if a mother initiates ART very late in pregnancy (less than 4 weeks prior to delivery), during labour, or post-partum.

Table 6-4: Infant NVP Prophylaxis Dosing

Infant age	**Daily dosing (of 10mg/ml NVP syrup)**	
		- If NVP causes toxicity, 3TC can be substituted. - If the mother is using replacement feeding, then AZT for four weeks can be substituted for NVP - If mother has had less than 4 weeks of ART, extend NVP to 12 weeks
Birth to 6 weeks • Birth weight 2000 -2499 gm • Birth weight ≥ 2500 gm	10 mg daily (1 ml od) 15 mg daily (1.5 ml od)	
> 6 weeks to 6 months	20 mg daily (2 ml od)	
> 6 months to 9 months	30 mg daily (3 ml od)	
> 9 months until breast-feeding ends	40 mg daily (4 ml od)	
Infants weighing <2000 g should receive 2mg/kg once daily		

6.5 POST-PARTUM INTERVENTIONS AND THROUGHOUT BREAST FEEDING

Following delivery, it is important to address the treatment, care and support needs of HIV-infected women, their children and families. This is Prong 4 of PMTCT. Ideally, mothers living with HIV and their HIV-exposed infants should be provided with ongoing HIV care and treatment services together in the same location. This follow-up could be done within MCH or within the ART clinic as appropriate to the human resource capacity and space within the facility.

Service for the mother

For the mother, the services include:

- Antiretroviral therapy (ART) - 6.3 *--throughout breast feeding* period
- Co-trimoxazole prophylaxis 3.6
- TB screening
- Continued infant feeding counselling and support Chapter 7
- Nutritional counselling and support 3.4
- Sexual and reproductive health services including FP 6.2.2
- Psychosocial support

Women with HIV and women of unknown HIV status who deliver outside health facilities should be assessed at an MCH facility as soon as possible.

Follow-up for the mother is usually scheduled at 6 weeks following delivery. At the post natal visit;

- Post –partum check (for sepsis, anemia, high blood pressure etc.); provision of vitamin A
- Family planning counseling and services
- Review of ART regimen and adherence support
- Re-enforcement of safe feeding practices
- Cervical cancer screening - where available

This visit usually coincides with immunization visit for the baby, and infant HIV testing. Thereafter the mother-infant pair should be followed up at 10 weeks, 14 weeks (as per immunisation schedule) and the quarterly. The baby should have an Ab test at 9 months. See

6.5.1 Care of HIV- exposed infants

Key Components of the Care Package For HIV- exposed Children:

- ARV prophylaxis for 6 weeks – 6.4.2
- Early Infant HIV testing at 6 weeks. Ab testing at 18 months – 2.3.1
- Routine immunization, growth and development monitoring 6.5,
- Co-trimoxazole prophylaxis (from 6 weeks of age) – 3.6
- Vitamin A 100,000-200,000 IU every 6 months up to the age of 5 years.
- Continued infant feeding counselling and support – Chapter 8
- Mother and family care Table 6-1: PMTCT Prong 4

NB: WHO clinical staging requires confirmed HIV infection. An infant aged under 18 months with only a positive HIV rapid antibody test can NOT be given a WHO clinical stage because in infants, HIV antibodies do not confirm HIV infection.

6.5.2 Early Diagnosis of HIV among Infants and older children

Key messages

- *Confirm HIV status as early as possible:*
- *Link all HIV-exposed infants to care* by 1 month of age for medical care and early diagnosis of HIV. To enhance easy identification of exposed infants, document mothers' HIV status on the MCH passport.
- To identify more HIV-exposed children, *implement PICT in all child care settings* (in-clients wards, clinics for immunization, under five, TB, malnutrition), and *provide HTC to children of adult PLHIV* attending HIV clinics
- *HIV Testing:* HIV infection among children below 18 months old is confirmed using DNA PCR; HIV infection among children 18 months and older can be confirmed using rapid HIV antibody tests. see Table 2-1, Figure 2-1 and Figure 2-2
  - An infant with HIV antibodies and specific clinical conditions is very likely to have AIDS and needs to start ART without delay
- Following HIV testing, enhance linkages and follow up of lost infants 2.6
- Infants and children below 5 years of age who are found infected with HIV should be initiated on ART 7.4

6.5.3 Routine Immunization

- HIV-infected infants and children can safely receive most childhood vaccines. All HIV infected and exposed children should be immunized as per South Sudan national Expanded Program (EPI) for Immunization schedule
- Immunization status should be reviewed at every visit
- BCG vaccination is protective against severe forms of TB such as miliary TB and TB meningitis. BCG should not be given to infants and children with symptomatic HIV infection. If BCG is administered at the right time (at birth), the majority of children will receive BCG vaccine, since HIV-infected children are unlikely to be symptomatic at birth.
  - If HIV symptomatic children are given BCG, they may develop BCG disease, whereby the BCG vaccination site develops an abscess, the axillary lymph nodes enlarge and the child gets TB symptoms. Children with suspected BCG disease should be referred to tertiary facilities for treatment.
  - When children, especially those below 1 year of age, start ARVs, the recovery of the immune system may lead to BCG disease Immune Reconstitution Inflammatory Syndrome (IRIS). This usually presents as an abscess and axillary lymph node enlargement. Refer to 4.6.2 & 9.6.3

6.5.4 Growth Monitoring

Growth monitoring is the regular measurement of a child's size in order to document growth. The child's size measurements must then be plotted on a growth chart. This is extremely important as it can detect early changes in a child's growth.

- Weight-for-age is usually used to monitor growth. It is particularly useful in small infants who normally gain weight fast. Normal weight gain suggests that the infant is healthy and growing normally. Failure to gain weight normally is often the earliest sign of illness or malnutrition (i.e. under-nutrition).
- Height and head circumference are also important measurements of growth. Height is the best method of measuring linear growth (stature) as height reflects growth over a longer period than does weight. Measuring height is therefore important measure of growth in older children.
- Head circumference can be used to assess brain growth in children under 2 years. During this period brain growth is fast and, therefore, head circumference increases rapidly. A small head (microcephaly) suggests a small brain, while a large head suggests hydrocephaly. Head circumference is less accurate in assessing brain growth over 2 years of age. Therefore, measuring head circumference is most useful in young children, and height in older children.

Frequency of growth monitoring

- Weight should be measured and recorded every month for the first year of life, every 6 months between 1 and 5 years. In addition, a child's weight should also be measured and recorded every time the child is seen at a clinic, hospital or by a general practitioner and the weight should be plotted on a growth chart.
- Height should be measured every year.
- Head circumference is not routinely measured unless there is a good reason.

- At all encounters with a child, growth parameters should be taken and recorded on the Child Health Card or ART Care Card.
- Plot the child's weight on a centile chart to compare the child's size (usually the weight) to that of other children using a growth chart. For a given age, the size of most children (94%) falls between the 3rd and the 97th centiles. These children are regarded as having a normal (average or appropriate) size for their age and are growing well.

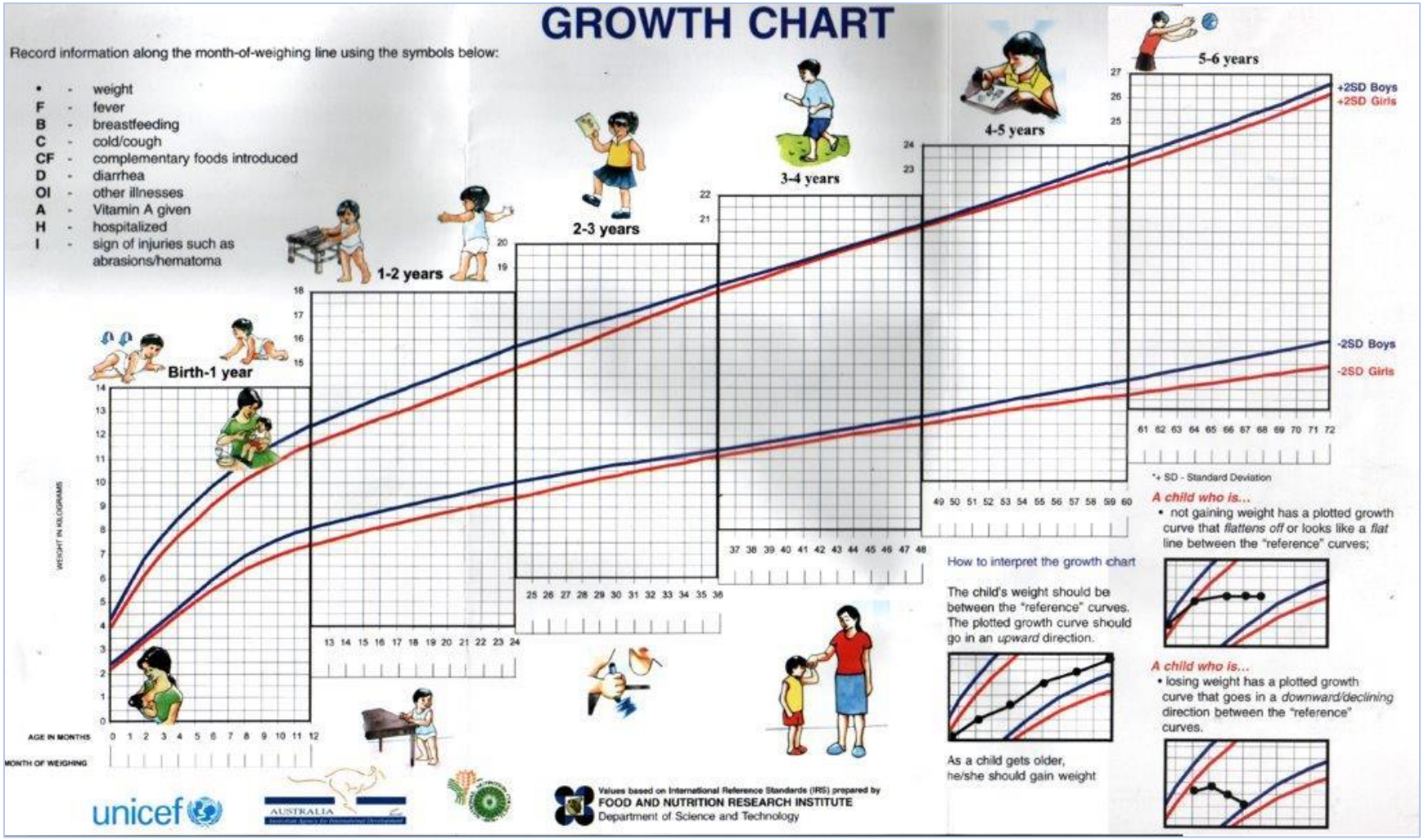
- Children are underweight if their weight is below the 3rd centile.
- Alternatively, Z-scores (standard deviations from the mean) may be used to assess a child's size. A Z-score of –2 is equivalent to the 3rd centile.
- A growth curve indicates the child's growth rate, and helps identify children who have a growth pattern that differs from the average growth pattern.
    - Wasting is a danger sign and suggests malnutrition or illness. These children usually look very thin and have a weight that falls below the 3rd centile while their height and head circumference often fall within the normal range. These children also have a body mass

index below the 3rd centile, i.e. they are underweight for their height. Their growth curve may show weight faltering.

- Infants with growth faltering (failure to thrive or slow growth) have not been gaining weight normally. Their weight may be static (remaining the same) or may even be dropping. Their height and head circumference may also not be increasing normally. Most of these children have a medical, nutritional or social problem, which needs to be urgently diagnosed and managed. Faltering weight gain must be detected as soon as possible so that the cause can be corrected. Growth faltering may be the first sign of HIV infection.
- Stunted children are shorter than normal for their age. As they are often symmetrically small and do not look thin, their stunting is often missed. Usually their growth curves have followed the centiles although their weight, height and head circumference all fall below the 3rd centile. Stunting usually occurs before 3 years of life.

- If failure to gain weight adequately does not respond to management at a primary care clinic, the child must be referred for further assessment and management. This is particularly important in children with a weight that falls or crosses centiles. Usually these children are referred to a special nutritional clinic where the following steps should be followed:
  - Exclude any chronic illness such as tuberculosis or HIV infection.
  - A dietician or nutritional counselor should educate the mother or caregiver.
  - A social worker should interview the mother or caregiver and assist where help is needed.
  - If the child is still not improving, refer to a paediatrician.
- Failure to gain weight or height, slow weight or height gain, and loss of weight may be an indication of HIV infection in an infant/young child: Failure to thrive affects as many as 50% of HIV-infected infants and children. HIV-infected infants and children who are failing to thrive have a significantly increased risk of mortality
- Counsel the mother/ caregiver on the child's growth trend and take appropriate action where necessary as outlined in section 3.4

Figure 6-2: Child Growth Chart



6.5.5 Development Monitoring

Development' represents maturation of the brain and central nervous system and broadly looks at a child's mental, physical, and social development.

Neurodevelopment:

Neurodevelopment is the progressive, orderly change of behaviour and activities which are seen as a children becomes older. Their physical ability and understanding of the world around them increases and matures with age. Developmental milestones are used to monitor neurodevelopment in childhood. The neurodevelopmental monitoring of milestones must be part of the routine growth and developmental screening of all children. Normally developing children should reach these milestones before (often long before) these cut-off ages

- Children with delayed milestones should be referred for formal neurodevelopmental assessment. The following milestones should be achieved:
    1. Smile at mother: 8 weeks
    2. Good head control: 6 months
    3. Sit unsupported: 9 months
    4. Crawl well: 12 months
    5. Make babbling noises ('baby sounds'): 12 months
    6. Stand without help: 15 months
    7. Walk without help: 18 months
    8. Understand simple commands: 24 months
    9. Use one or two words: 36 months
- HIV-infected and exposed Infants are at high risk for HIV encephalopathy, severe neurologic disease and developmental delay. Delayed development or loss of development milestones may be the first sign of HIV infection in an infant or young child. Early identification of developmental delay and neurologic abnormalities can facilitate intervention and remediation.
    - Development monitoring assesses cognitive, motor, language and social skills of a child.
    - Delay in acquisition or loss of these is a sign of severe HIV in infants and children
    - Low head circumference may also be an indicator of developmental delay and suggestive of brain encephalopathy
- It is always important to ask parents to report on milestones achieved by the child since their last visit. All this should be documented on the Child Health Card.

Sexual development:

Puberty is the time when the physical signs of sexual maturity (secondary sexual characteristics) appear due to the secretion of sex hormones in older children. Puberty is earlier in girls (8 to 13 years) than boys (10 to 15 years). A marked growth spurt occurs during puberty. There are also many emotional and social changes.

- Children with early (precocious) puberty and those with late (delayed) puberty must be referred for a specialist opinion.
- Physical changes during puberty can be formally graded into 5 stages (from pre-puberty to full sexual development). Genital development (appearance of penis, testes and scrotum) and pubic hair are scored in boys while breast development and pubic hair are scored in girls. Menstruation in girls starts towards the end of puberty when the growth spurt is almost complete. These are the stages described by Tanner. For adolescents, refer to the *Tanner Staging* chart to assess for development of secondary sexual characteristics.

6.5.6 Cotrimoxazole prophylaxis in children

- All HIV exposed infants from 6 weeks of age until proved to be HIV negative need daily cotrimoxazole prophylaxis.
- All children proven to be HIV infected need cotrimoxazole prophylaxis to be continued for life even after they start ARVs. Refer to 3.6

6.6 COMMUNITY PMTCT/PMTCT

All HIV positive pregnant mothers and their families should be linked to psychosocial and community groups for on-going support. Linkage to community support groups (family support groups, peer mothers) is important in enhancing retention in care. Community involvement is necessary for successful implementation of PMTCT & EID services in the country.

Key community PMTCT interventions include;

- Community mobilization and sensitization to utilize RH/PMTCT services.
- Promotion of male participation in RH/PMTCT services
- Psycho-social support through peer mothers for PMTCT and other groups
- Health Education and Promotion
- Mother-Baby Pair follow up
- Home based HTC
- Community distribution of FP commodities
- Community linkages and tracking to care and support groups.
- Community growth promotion and development monitoring.-
- Sexual and Gender Based Violence (Sensitization, prevention and Support)

- Care for HIV- Infected children

Paediatric HIV accounts for about 13% of all HIV infections globally. The majority of children (over 90%) with HIV acquire the infection through mother-to child transmission during pregnancy, at birth, or through breast feeding. HIV infection in children tends to follow a more aggressive course than in adults. Mortality is very high among untreated infants infected with HIV; without HIV treatment, 52% of infected children die within two years. It is therefore essential to have early diagnosis of HIV, prompt return of results, and rapid ART initiation.

To improve access to paediatric care, paediatric HIV diagnosis, care, treatment, and support services should be integrated into existing adult HIV clinical and community services.

- PITC should be offered in all clinics attended by women and children especially targeting children who are malnourished, have TB, are admitted to hospital, or have signs of HIV infection
- All facilities providing ART for pregnant and breast feeding women should be providing paediatric ART and related services
- All maternal, newborn and child health (MCNH) programs should integrate early infant HIV testing (using Ab testing or DNA-PCR where available) into immunization outreaches, and well-child /young child days

Key interventions for HIV infected children *(in addition to services for HIV-exposed children)*

- Routine monitoring for children who are not yet on ART
- Prevention and treatment of opportunistic infections (including TB) – 3.5
- Antiretroviral therapy (if confirmed to be HIV infected) – 7.4
- Adolescent care and support – Chapter 5
- Psychosocial support and palliative care

6.7 ROUTINE MONITORING FOR CHILDREN WHO ARE NOT YET ON ART

- Because of the rapid rate of disease progression in infants and young children, more frequent monitoring is indicated for children than for adults.
- HIV positive children should have *monthly clinic visits* to receive clinical care and drug refills.
- Children should be managed in the same clinic with mothers/parents and other family members. Always synchronize the child's clinic appointment with that of the mother / parents to reduce on the number of visits.
- At every visit, perform clinical staging, CD4 monitoring every six months (for those older than 5 years), and TB screening.
- All children below 5 years of age should be initiated on ART immediately regardless of CD4 cell count or clinical stage.

6.8 HIV AND TB CO-INFECTION IN CHILDREN

Children living with HIV are at increased risk of acquiring infection and progression to active TB disease following exposure to *M. tuberculosis* compared to those who are HIV negative. About 50% of HIV infected children with TB infection go on to develop TB disease. Those who develop TB disease have a poorer prognosis for severe disease. HIV infected children often have co-existing severe malnutrition which is also a risk factor for progression to severe disease.

6.8.1 TB screening in children

- All HIV-infected and exposed infants and children should be evaluated for TB symptoms using the TB screening algorithm at every visit to a health-care facility. In addition, they should be evaluated for contact with a TB source case. See Figure 12-2
- Those reporting either positive contact history, poor weight gain, or any suggestive symptoms should be investigated for TB.
- Infants and children have a wide range of pulmonary and extra pulmonary manifestations of tuberculosis. Clinical conditions suggesting a possibility of TB include bronchopneumonia without improvement on a 7-14 day course of broad spectrum antibiotics, pleural effusion, asymmetrical peripheral lymphadenopathy, spinal deformity, abdominal peritonitis, ascites and meningitis in a setting of the above symptoms.

6.8.2 TB diagnosis in children:

- Diagnosis of TB in children is challenged by the difficulty in obtaining sputum for bacteriological confirmation of the disease. Samples such as sputum (by expectoration, gastric aspiration or induction), fine-needle aspirates of enlarged lymph nodes, pleural fluid or ear swabs should be subjected to microscopy and other available bacteriological investigations. Gastric aspirates should not be undertaken in the absence of culture or GenXpert services.

- Diagnosis of TB in children is often presumptive and based on suggestive clinical signs and symptoms, findings on chest x-ray where available, Tuberculin Skin Testing (TST) and other investigations.

- When making a diagnosis of TB among HIV infected infants and children, one needs to exclude HIV related fevers, weight loss, systemic and respiratory diseases which may mimic TB. The TST may be negative even in presence of TB disease. Chest X-ray features in PTB are often non-specific and/or similar to those seen in other HIV related lung diseases such as bacterial pneumonia, viral pneumonia, LIP (lymphocytic interstitial pneumonitis), *Pneumocystis Carinii/Jiroveci* pneumonia, Kaposi's sarcoma, fungal lung disease and pulmonary lymphoma.

- The most important diagnostic clue for detecting TB in HIV infected children is a history of contact with an adult who has infectious TB. Since TB may not have yet been diagnosed in this adult, a prompt evaluation for TB in adults who care for the children is a critical part of the evaluation of the children.

6.8.3 TB prevention in children

- Protection of HIV infected infants and children from TB can be achieved through early detection and treatment of adult infectious cases and universal use of BCG at birth and IPT (where implemented).
- BCG vaccination is protective against severe forms of TB such as miliary TB and TB meningitis. It should not be given to infants and children with symptomatic HIV infection.

6.9 ANTIRETROVIRAL THERAPY FOR INFANTS AND CHILDREN

Before a child is started on ART one has to ascertain the following;

- If the child is eligible for ART
- If the parents /caretakers or child (if older) are ready to start lifelong ART
- A pre-treatment baseline assessment has been performed

6.9.1 ART eligibility criteria for infants and children

ART eligibility criteria: Infants and children

- All infants and children under 5 years of age should be initiated on ART regardless of WHO clinical stage or CD4 cell count
- All children with WHO clinical stage 3 or 4 disease should be started on ART regardless of age or CD4 count
- All children above 5 years should be started on ART if CD4 count is less than 500 cells/mm^3 (with priority given to those with low CD4 below 350 cells/mm^3)
- All infants under 18 months of age with a presumptive diagnosis of HIV

6.9.2 Preparation for Anti-retroviral Therapy

- A child depends on a reliable parent/guardian to receive regular treatment. Children eligible for treatment should be assessed for readiness to initiate ART and prepared for lifelong treatment.
- Adherence counseling sessions should be attended by the parent/guardian/caregiver and the child. Topics covered are essentially similar to adults' counseling. However, other issues that should be addressed during counseling include timing of disclosure of HIV sero-status, the challenge of sustaining confidentiality and minimizing stigma.
- *Pre-treatment baseline assessment for children* is similar to adults but in addition:
  - Weight, height, head circumference, MUAC (age 6-59mo)
  - Assessment of the child's and caregiver's preparedness for therapy.
  - Measurement of CD4% (preferable for children <5 years) or absolute CD4 cell count where available. CD4 test result is not a requirement for starting ART as all children <5 are eligible.

Table 6-5: ART Regimens for Infants and Children with HIV: 1st And 2nd Line

First line regimens		
Category	**Regimen**	• **Comment (s)**
All infants and children under 3 years (or < 10kg)	ABC + 3TC + NVP	• If ABC is contraindicated, give AZT+3TC+ NVP • If a child is anemic (Hb <7.5g/dl) do not use AZT. Use ABC based regimen. • Do not use EFV in children under 3 yrs (or 15 kg).
Children ≥ 3 years-10 years and adolescents ≤ 35kg	ABC + 3TC + EFV	• If EFV is contraindicated, give ABC+3TC+NVP • If ABC is contraindicated, give AZT+ 3TC+EFV (or NVP) • If ABC and AZT are contra-indicated, give TDF+3TC+EFV (or NVP) • If a child is anemic (Hb <7.5g/dl) do not use AZT. Use ABC based regimen.
Adolescents 10-19 years ≥35 kg	TDF+3TC+EFV	• If EFV is contraindicated, use NVP : TDF+3TC+NVP • If TDF is contraindicated, use AZT: AZT+3TC+EFV (or NVP) • If TDF and AZT are contraindicated, use ABC: ABC+3TC+EFV (or NVP)
2nd line regimens		
Failed 1st Line: ABC (or TDF) +3TC + EFV (or NVP)	AZT + 3TC + LPV/r	
Failed 1st line: AZT +3TC+ +EFV(or NVP)	ABC (or TDF) +3TC+LPV/r	
Third Line ART		
Failing any 2nd line regimen	Refer for specialist opinion	

NRTI drug combinations to be avoided, D4T + AZ; TDF +ABC -both drugs select for the K65R mutation

While a LPV/r based regimen was recommended by WHO (2013) as first line for children below 3 years, there are still challenges with use of this regimen in South Sudan mainly due to its requirement for cold chain conditions during transportation and lack of available treatment options for 2nd line if a child should fail this regimen. For these reasons, a NVP-based regimen has been recommended. It is anticipated that the LPV/r regimen will be adopted in future when new heat-stable sprinkle formulations become available.

Second line ART for children (including adolescents)

- After failure of first line NNRTI-based regimen, a boosted PI plus two NRTIs is recommended for second line ART; LPV/r is the preferred PI
- After failure of first line regimen of ABC or TDF+3TC (or FTC), the preferred NRTI backbone option for second line is AZT+3TC
- After failure of a first line regimen containing AZT or d4T +3TC (of FTC), the preferred NRTI backbone option for second line ART is ABC or TDF+ 3TC (or FTC)

The dosing of ARV Drugs for infant and children can be seen in Table 7-2.

Table 6-6: ARV drug dosing for infants and children

	ABC/3TC/AZT	AZT/3TC/NVP	ABC + 3TC	AZT/3TC	LPV/r	EFV	NVP	ABC	3TC	AZT
Target dose	ABC 8 mg/kg twice daily AZT 180 – 240 mg/m2 twice daily 3TC 4 mg/kg twice daily	AZT 180 – 240 mg/m2 twice daily 3TC 4 mg/kg twice daily NVP 160 – 200 mg/m2	ABC 8 mg/kg twice daily 3TC 4 mg/kg twice daily	AZT 180 – 240 mg/m2 twice daily 3TC 4 mg/kg twice daily	300/75mg mg/m^2 twice daily	By weight band ONCE daily	160-200mg/m2/dose TWICE daily (after once daily lead-in ×2 wks	8mg/kg twice daily	3TC 4 mg/kg twice daily	180-240mg/m2/dose TWICE daily
Available Formulations	Paed: ABC 60 mg + AZT 60 mg + 3TC 30 mg tabs crushable an scored Adult: ABC 300 mg + AZT 300 mg + 3TC 150 mg tabs	Paed: AZT 60 mg + 3TC 30 mg + NVP 50 mg (tablet dispersible and scored) Adult: AZT 300 mg + 3TC 150 mg + NVP 200 mg	Paed: ABC 60mg + 3TC 30 mg dispersible tablet (60mg/30mg) Adult: 600mg /300mg tab	Paed; AZT 60 mg + 3TC 30 mg tab – scored Adult: AZT 300 mg + 3TC 150 mg tab	Co-formulated heat-stable tabs Paed: LPV 100 mg/RTV 25 mg Adult LPV 200 mg/RTV 50 mg	Cap 50 mg, Tabs 200mg (scored), 600mg (not scored)	Tabs: Baby: 50 mg (dispersible) Adult: 200 mg (scored) Junior: 100 mg Sol: 10 mg/ml	Tablets 60 mg (scored) 300 mg	Tabs: 150 mg, 300mg (scored) Liquid: 10 mg/ml	Tabs 60 mg Tabs 300mg (not scored)
Wt (kg)	**Weight in Kg**									
3-3.9	1 bd	1 bd	1 bd	1 bd	NR	NR	5 ml bd 50 mg tab: 1 bd	60 mg tab: 1 bd	3 ml bd	60 mg tab: 1 bd
4 – 4.9					NR	NR			3 ml bd	
5 - 5.9					NR	NR			3 ml bd	
6 – 6.9	1.5 bd	1.5 bd	1,.5 bd	1.5 bd	NR	NR	8 ml bd 50 mg tab: 1.5 bd	60 mg tab: 1.5 bd	4 ml bd	60mg tab:1.5 tabs bd
7-7.9					NR	NR				
8 – 8.9					NR	NR				
9 – 9.9					NR	NR				
10 – 10.9	2 bd	2 bd	2 bd	2 bd	2 tabs am, 1 tab pm	200 mg tab; 1 OD	10 ml bd 50 mg tab: 2 bd	60 mg tab: 2 bd	6 ml bd	60 mg tabs: 2 bd
11- 13.9										
14 -16.9	2,.5 bd	2.5 bd	2.5 bd	Paed tab 2.5 bd Or Adult tab 0.5 tab bd	Paed tab: 2 bd OR Adult tab 1 bd	200 tab: 1.5 od	50 mg tab: 2.5 bd 200 mg tab: 1 tab am ½ tab pm	60 mg tab: 2.5 bd 300 mg tab: ½ bd	150 mg tab: ½ bd	60 mg tab: 2.5 bd
17 – 19.9										
20- 24.9	3 bd of paed tabs OR Adult tab 1 tab am, 0.5 tab pm	3 bd	3 bd	3 bd	Paed tab: 2 bd OR Adults tab 1 bd	200 tab: 1.5 od	50 mg tab: 3 bd 200mg tab: 1 tab am ½ tab pm	60 mg tab: 3 bd 300 mg tab: 1 am, ½ pm	150 mg tab: 1 am, ½ pm	60 mg tab: 3 bd
25- 29.9		Adult tab 1 bd	½ bd of adult 600/300 tab	Adult tab 1 bd	Paed tab: 3 bd Or Adult tab 2 am and 1 pm	200 mg tab: 2 od	200 mg tab: 1 bd	300 mg tab: 1 bd	150 mg tab: 1 bd	300 mg: 1 bd
30 – 34.9	Adult tab 1 bd									

6.9.3 Routine Monitoring of Children on ART

- After starting ART, follow-up visits should ideally be harmonised with the visits of the mother.
- For infants, at weeks 2, 4, 8, and then every 4 weeks for the first year
- For children, at weeks 2, 4, 8, 12, and then every 2 to 3 months once the child has stabilized on therapy.
- Routine clinical assessment should include addressing the child's and/or caregiver's understanding of ART and adherence to therapy, along with their need for additional support.
- Key signs of an infant's and child's response to ART include:
    - Improvement in growth of infants and children who have been failing to grow
    - Decreased frequency of infections (bacterial infections, oral thrush and/or other OIs).

Table 6-7: Monitoring Infants and Children with HIV

At initiation of ART (Baseline)		
Test	**Purpose**	**Comment**
CD4 count (if not performed in last 6 months)	As baseline reference CD4	For children below5 years, DO NOT wait for CD4 count to start ART
On ART		
Height, Weight, Head Circumference (<2yrs) and Development	To monitor Growth and Developmental stage	
Clinical assessment	To monitor response to ART and exclude adverse effects	
TB screening	To identify children who are co-infected with HIV and TB	
CD4 at 6 months into ART, and then every 6 months	To monitor response to ART	Can use viral load for monitoring where it is available
VL on suspicion of treatment failure (clinical and immunological failure)	To confirm treatment failure	See definition of ART failure in children in Table 7-4
Hb or FBC at month 1, 2, 3 into ART and then annually if on AZT	To identify AZT-related anaemia	
Clinical drug-related adverse events	To identify drug-related adverse events	If develops jaundice or rash on EFV or NVP do Liver function tests and refer to specialist

Immune Reconstitution Inflammatory Syndrome in children:

- There are limited data on IRIS in infants and children. The onset of IRIS in children most often occurs within the first weeks to months following the initiation of ART and is seen most often in children who initiate ART with very low CD4 levels or percentage (<15%).
- The most common opportunistic infection associated with IRIS in children is TB, but those on treatment for Pneumocystis pneumonia (PCP) or cryptosporidiosis, or who have herpes simplex virus (HSV), fungal, parasitic or other infections may also develop IRIS.
- Where BCG immunization of infants and children is routine, BCG-associated IRIS (localized and systemic) may be observed especially among HIV+ children who are undiagnosed or newly diagnosed.

ARV drug toxicity in children:

- Some toxicities are less common in children than in adults e.g. the lipodystrophy associated with use of stavudine (d4T) or the symptomatic hepatotoxicity related to nevirapine (NVP) use, while others are more commonly reported in children than in adults e.g. efavirenz (EFV) related rash. See Table 13-2 and Table 4-7 for more detail on ARV toxicity.

ARV failure in children

- Children failing first line ART should be initiated on second line regimens as seen in Table 7-1.

Table 6-8: ART failure in children

Failure	Definition	Comments
Clinical failure	• New or recurrent clinical event indicating severe immunodeficiency (WHO stage 3 and 4 condition with the exception of TB) after 6 months of effective treatment	Must be differentiated from IRIS occurring after ART initiation.
Immunological failure	• Younger than five years : Persistent CD4 levels below 200 cells/ml or less than 10% • Older than five years : persistent CD4 levels below 100 cells/ml	Without concomitant or recent infection, to cause a transient decline in CD4 cell count.
Virological failure	• Plasma viral load above 1000 copies / ml based on two consecutive viral load measurements after 3 months, with adherence support . Refer to Figure 4-1	An individual must be taking ART for at least 6 months before it can be determined that a regimen has failed.

7 INFANT AND YOUNG CHILD FEEDING

Breastfeeding accounts for up to 20% of infections acquired through Mother-To-Child Transmission (MTCT) in the absence of interventions. At the same time, breastfeeding is critical for the survival of the infant. Infants that are not breast-fed are at increased risk of death from malnutrition, diarrhoea and pneumonia.

HIV transmission through breastfeeding can be significantly reduced if a mother breastfeeds her child exclusively and if the mother or the baby receive ARV drugs at the same time. To maximize the benefit of breastfeeding and improve infant survival, while reducing the risk of HIV transmission, South Sudan has adopted use of ART with continued breastfeeding by HIV infected mothers until the infant is 12 months of age. Breastfeeding should then only stop once a nutritionally adequate and safe diet without breast-milk can be provided. In the absence of safe and adequate diet to children beyond 12 months of age, breastfeeding should continue.

7.1 KEY MESSAGES DURING PREGNANCY AND BREASTFEEDING

- *Diet:* Add extra meals during pregnancy and breastfeeding; drink adequate fluids; eat plenty of fruits and vegetables; eat foods rich in vitamin C to enhance iron absorption; avoid tea or coffee close to (less than 1 hour) or with meals as this may interfere with absorption of iron; and use iodized salt to prevent pregnancy complications (abortions, miscarriages and stillbirths), fetal growth retardation, and maternal goiter.

- *Recommended medications during pregnancy including*: supplemental iron to prevent anemia; folic acid to prevent fetal brain and spinal cord birth defects; de-worming tablets to treat worms and prevent anemia; and vitamin A capsule (200,000 iu)mmediately after delivery or within 8 weeks to help build your baby's immunity.

- *Malaria prevention:* Malaria may cause anemia. Mothers should sleep under an insecticide-treated mosquito net; take intermittent preventive treatment (IPT) for malaria as per national guidelines beginning in the second trimester.

- Avoid alcohol, narcotics or tobacco products and medicines that are not prescribed by a trained health care provider.

- *Attend ANC:* at least four times during pregnancy and always follow your health worker's recommendations.

- A*ctive promotion of breast feeding initiatives;*
  - Counsel pregnant women on the benefits of breastfeeding and management, importance of adhering to ART regimen, and the risk of MTCT.
  - Counsel on the benefits of exclusive breastfeeding for the first six months regardless of the HIV serological status.
  - Link the mothers to support systems such as mother support groups, lactation clinics on discharge from the hospital or clinic.
  - Demonstrate to mothers how to position infants when breastfeeding, and how to maintain lactation should they be separated from their infants. Pay particular attention to prevention of conditions such as cracked nipples, mastitis that increase risk of HIV transmission.

7.2 DURING LABOR AND DELIVERY:

- Mothers should be encouraged to initiate breastfeeding within an hour of birth including cases of caesarian section
- Newborn infants should be fed on only colostrum (the first milk) and not be given pre-lacteal feeds such as glucose, dill/ gripe water, mushroom soup; herbal extracts, etc
- Continue to counsel on demand feeding, exclusive breastfeeding, ways to enhance breastfeeding

7.3 DURING LACTATION

Recommendation:

- All HIV exposed infants should be exclusively breast fed for the first six months. See Table 8-1
- Mothers known to be infected with HIV (and whose infants are HIV uninfected or of unknown HIV status) should exclusively breastfeed their infants for the first 6 months of life, introducing appropriate complementary foods thereafter, and continue breastfeeding for the first 12 months of life. Breastfeeding should then only stop once a nutritionally adequate and safe diet without breast-milk can be provided.

- *For HIV exposed but not HIV infected:* From six months continue BF until the infant is 12 months old. After 12 months, BF should be stopped only if nutritionally adequate and safe diet which includes source of milk can be provided.
- *HIV exposed and HIV infected:* Continue BF as per the general population until the child is 24 months and beyond.
- *HIV exposed and HIV infected on ARV treatment:* Continue BF as per the general population until the child is 24 months and beyond.
- *HIV exposed and unknown HIV status:* Endeavour to establish the HIV status of the infant. In the meantime, encourage exclusive BF for the first six months, introduce complementary feeds at six months with continued BF until the infant is 12 months old. Once the infant's HIV status is established, follow the above guidelines as appropriate.

Table 7-1: Essential Behaviors for Exclusive Breastfeeding

A mother practices optimal breastfeeding during the first six months when she:
- Initiates breastfeeding within one hour of birth
- Feeds the colostrum to the baby
- Positions and attaches the infant correctly at the breast
- Breastfeeds on demand
- Breastfeeds frequently during the day
- Breastfeeds during the night
- Offers second breast after infant empties the first
- Gives only breast milk; gives no water or teas or any other liquids or foods.
- Continues breastfeeding when she is sick
- Increases breastfeeding frequency during and after infant's illness, including diarrhoea.
- Seeks help from a trained health worker or counsellor if she has problems with breastfeeding
- Eats sufficient nutritious foods herself and takes supplements as recommended by the health provider

7.4 COMPLEMENTARY FEEDING

- *At 6-12 months*
  - After 6 months of age, appropriate complementary foods should be introduced while continuing to breastfeed until 12 months.
  - The mother should be encouraged to breastfeed as often as the infant wants
- *At 12-24 months*
  - Discourage breastfeeding for mothers, whose infants are HIV negative at 12 months unless there are no alternative form of milk to be given.
  - Encourage mothers to feed their children 5 times a day - 3 main meals and 2 extra foods between meals (snacks).
- *12-24 months for infants who are HIV infected*
  - Encourage mothers to continue breastfeeding on demand, day and night up to 24 months and beyond to maintain the baby's health and nutrition.
  - Counsel caregivers to:
    Give 1 extra snack to well children and 1 extra meal (or 2 snacks) at onset of sickness.
    Give 3 extra meals (or 2 extra meals and 1 snack) when sick and losing weight
- *Feeding a child 2– 6years*
  - Encourage mothers to give a variety of foods prepared from the family meal (each meal should consist of a carbohydrate, protein, vegetables) at least 3 main meals a day.
  - Encourage care givers to give nutritious snacks between meals e.g. a fruit, egg, bread, enriched thick porridge or a glass of milk.

Table 7-2: Essential Behaviors for Complementary Feeding

A mother practices optimal complementary feeding during the period 6-23m of the infant's life when she:
- Starts feeding additional foods to the child at the age of 6 months
- Starts with soft or mushy foods at first that are age appropriate and are not too thin or thick, and gradually shifts to foods of a solid consistency if the child is ready.
- Continues breastfeeding up to two years of age or beyond.
- Offers solid or semi-solid foods 2-3 times per day when child is between 6-8 months of age, and 3-4 times per day after that, and offers nutritious snacks 1 or 2 times per day, as desired.
- Offers a variety of foods, from all the food groups (grains, roots and tubers, legumes and nuts, animal source foods and fruits and vegetables) and increases in variety and quantity as the child grows.
- Practices good hygiene in preparation and storage of complementary foods (including washing hands before and using clean water and utensils).
- Continues breastfeeding and feeding complementary foods during illness.
- Gives the child iron-rich foods such as animal source foods or iron supplements if iron-rich foods are less available.
- Uses feeding times for interacting with the child, to teach and stimulate social development as well as encourage the child to eat.

Additional Messages:

HIV positive mothers who decide to stop breastfeeding at any time should stop gradually. This transition period should be between 1-2 weeks which is not too long to increase exposure and not too short to cause physical and psychological trauma to the mother and baby. Mechanism of transition includes:

- Expressing Breast Milk (BM) and feeding infant/child by cup
- Substituting the expressed BM with suitable replacement feed gradually.
- Replacement feeding (using alternative milk other than breast milk in the first 6 months of life) should be recommended only in extreme circumstances such as: mother absent, dead or mentally disabled.

8 TUBERCULOSIS AND HIV

8.1 INTRODUCTION

Among PLHIV, tuberculosis (TB) is the most frequent life-threatening opportunistic infection and a leading cause of death. TB is responsible for more than 25% of all deaths among PLHIV. HIV infection increases the risk of acquiring TB and progression to active TB disease following exposure to *M. tuberculosis*. The risk of new tuberculosis disease in HIV-infected individuals can be lowered, by reducing exposure to TB, using Isoniazid Preventive Therapy (IPT), and provision of anti-retroviral therapy (ART).

Interventions for TB and HIV should be integrated in both TB care and HIV care settings.

- ART for PLHIV with TB should be initiated in the TB care setting, with linkage to on-going HIV care and ART, and transition to the ART clinic after completing TB therapy. This will first be implemented at the referral centers such as JTH, Nzara, Yambio and Yei, and later rolled out to other sites.
- For PLHIV attending HIV care settings who are diagnosed with tuberculosis, TB treatment should be provided in the HIV care settings where the TB diagnosis has also been made.
- Immediate referral is encouraged whenever services are not on site.

Key TB/ HIV interventions:

- Provider initiated HIV testing and counseling (PITC), and other HTC approaches 2.2
- Cotrimoxazole Preventive therapy and other General HIV care – 3.6
- The 3 'I's for HIV/TB
  - Intensified Case Finding (ICF) 9.2
  - Infection Control (IC) 9.4
  - Isoniazid Preventive therapy (IPT) 9.3
- Anti-TB treatment – see Table 3.5
- Antiretroviral therapy - see Chapter 4 and 9.6

NB: Special attention is given to Multiple Drug Resistant TB (MDR-TB) and TB-HIV co-infection in children

8.2 INTENSIFIED CASE FINDING FOR TB

- TB screening among PLHIV should be done at every visit using a clinical algorithm as shown in Figure 12-1 and Figure 12-2
- Evaluate clients for TB using sputum smear for AAFB, chest X-ray, etc. only if:
  - An adult/adolescent has current cough, fever, weight loss, or night sweats.
  - A child has any one of the following symptoms of current cough, fever, poor weight gain, or close contact with a TB client. See 8.8.2 on TB diagnosis in children.
- Sputum smear-negative TB is common in HIV-infected adults and children, particularly those with advanced immunodeficiency and non-cavitary disease.
- Diagnosis may be enhanced among smear negatives by use of Xpert MTB/RIF (GeneXpert).
- For those confirmed with TB, see treatment of active TB in 9.5 below.

8.3 ISONIAZID PREVENTIVE THERAPY (IPT)

Isoniazid Preventive Therapy reduces TB incidence by about 60% in HIV- infected individuals. Providing IPT to PLHIV does not increase the risk of developing isoniazid-resistant TB.

- *Routine use of IPT is however not currently recommended in South Sudan mainly due to challenges in excluding active TB among PLHIV.*
- Use of IPT is recommended for children of breast feeding mothers with active TB. All HIV-infected infants and children exposed to TB through household contacts, but with no evidence of active disease, should begin Isoniazid preventive therapy (IPT). Before giving the INH prophylaxis, confirm that the child has no ACTIVE TB disease (does not have cough, fever, poor weight gain). The recommended dose of Isoniazid (INH) for preventive therapy in HIV co-infection is 10 mg/kg/daily for 6 months.

8.4 TB INFECTION CONTROL (IC)

Each health facility should have a TB infection control plan to reduce transmission of TB in the health care setting and actively look out for development of TB among the workers. Tuberculosis IC plans need to be developed in line with the *TB Infection Control Guidelines for South Sudan – 2012*. The TB Infection Control Guidelines should also be used for:

- Development of SOPs to triage and identify TB suspects, ensure separation of suspects from cases, promote good cough etiquette and respiratory hygiene, and rapid TB diagnosis and treatment.
- Provision of information to Health Care Workers TB prevention and care, protective equipment such as respiratory masks, and those living with HIV should be offered ART as well as possible relocation to lower risk areas.
- Provision of information on environmental measures such as proper ventilation and lighting.

8.5 TREATMENT OF ACTIVE TUBERCULOSIS IN HIV-INFECTED CLIENTS

- The principles for treatment of active tuberculosis (TB) disease in HIV-infected patients are the same as those for HIV-uninfected clients .
- Patients co-infected with TB and HIV should receive at least 6 months of a rifampicin-containing anti-TB treatment regimen. Use standard regimen TB regimen 2HERZ/4RH). See Table 3-5
- TB treatment may be provided in either the HIV clinic or the TB clinic
  - Initiate ART as per guidelines taking into consideration the drug interactions. ART should be started within 8 weeks of TB diagnosis or within 2 weeks for persons with advanced immune suppression. See 4.4.1
- Cotrimoxazole prophylaxis should be continued
- Add pyridoxine 50mg daily (adults) in view of the risk of peripheral neuropathy associated with INH. Stavudine (d4T) should be avoided in co-infected clients who need ART particularly those with very low CD4 counts because the risk of peripheral neuropathy is higher in these clients.

8.6 ANTIRETROVIRAL THERAPY IN PATIENTS WITH ACTIVE TUBERCULOSIS

Key recommendations:

- PLHIV diagnosed with active TB should be started on anti-TB therapy immediately
- All PLHIV diagnosed with active TB should be treated with ART within 2 weeks and not later than 8 weeks of anti-TB initiation ((including those with drug resistant TB) regardless of CD4 count.
- The recommended first line ART regimen for adult and adolescent ARV drug-naïve clients with TB/HIV who require ART while still on rifampicin is: TDF + 3TC (or FTC) + EFV. See Table 4-6
- For adults and children diagnosed with TB while on ART (1st and 2nd line), see regimen changes in 4.4.1
- Immune reconstitution inflammatory syndrome (IRIS) may occur after initiation of ART. Both ART and TB treatment should be continued while managing IRIS 4.6.2
- Treatment support, which can include directly observed therapy (DOT) of TB treatment, is strongly recommended for HIV-infected patients with active TB disease.

Concurrent treatment of TB and HIV is potentially complicated by high pill burden, additive toxicities, drug interactions, and the potential for development of IRIS.

8.6.1 Drug Interaction Considerations

- Rifampicin induces liver enzymes thus reducing the serum levels of most ARV drugs including all PIs, and the NNRTIs especially NVP. Rifampicin is not recommended for routine use in combination with PIs and efavirenz is the preferred option in clients on this treatment. However, in circumstances where a PI has to be used e.g. for clients diagnosed with TB while on second line ART, LPV/r can be used with rifampicin-containing regimens, but requires dose boosting. See 4.4.1
- Rifabutin, a weaker enzyme inducer, is an alternative to rifampicin in adults. When used in place of rifampicin, the ART regimens need not be adjusted
- Rifampicin interferes with combined oral contraceptive pills, progestin-only pills, and Norplant rendering them less effective. The most effective family planning option would be Depo-Provera along with condoms to minimise risk of HIV and STI transmission.

8.6.2 ART regimens for adults and children with TB

If TB is diagnosed before starting ART:

- Start TB treatment (add pyridoxine to reduce risk of INH-induced neuropathy)
- Introduce ART within 2-8 weeks of initiating TB therapy i.e. ART should be started within 8 weeks of TB diagnosis or within 2 weeks for persons with advanced immune suppression:
    - For adults: TDF + 3TC (or FTC) + EFV
    - For children: see Table 9-1 below

For adults and children diagnosed with TB while on 1st ART:

- Continue ART throughout TB treatment
- For adults, and children 3 years and older, continue with the same regimen.
- For children under 3 years maximize dose of NVP to 200mg/m^2 or give a triple NRTI regimen (AZT/3TC/ABC)

Adults and children diagnosed with TB while on second line ARV regimen:

- For adults, the lopinavir/ ritonavir dose should be doubled (from 2 tablets 12 hourly to 4 tablets 12 hourly) while the client is on rifampicin-based TB treatment. Monitor ALT monthly. Reduce lopinavir/ ritonavir to standard dose 2 weeks after TB treatment is completed. For children, consider Adding RTV to achieve the full therapeutic dose i.e. increase RTVC until it reaches the same dose as LPV in a ratio of 1:1.

Table 8-1: ART Regimens for Children and Adolescents with TB

Initiating ART while on TB treatment		
Younger than 3 years	AZT+3TC+NVP	Ensuring NVP dose is 200mg/m^2
3 years or older	AZT+3TC+EFV	Alternative: Triple NRTIs (AZT+3TC+ABC)
Initiating TB treatment while on ART		
Child on first line: standard NNRTI-based regimen (two NRTIs +EFV or NVP	Younger than 3 years	Child on preferred 1st line ABC+3TC + NVP OR **AZT+3TC+NVP** Continue NVP, ensuring dose is 200mg/m^2 OR give Triple NRTIs (**AZT+3TC+ABC – preferred**
	3 years or older	Child on ABC +3TC+EFV or ABC+3TC+NVP or AZT+3TC+EFV (or NVP) If the child is receiving EFV, continue the same regimen - **ABC +3TC+EFV – preferred** or give **AZT + 3TC+EFV** If the child is receiving NVP, substitute with EFV
Child on second line	Younger than 3 years	Substitute NVP with LPV/r ensuring dose is 200mg/m^2 Or Use Triple NRTIs (AZT+3TC+ABC) Or Continue LPV/r consider adding RTV to achieve full therapeutic dose (Increase RTV until it reaches the same dose as LPV in mg , in a ratio of 1:1 (super-boosted LPV/r)
	3 years or older	Substitute EFV for LPV/r OR Use Triple NRTIs (AZT+3TC+ABC) OR Continue LPV/r consider adding RTV to achieve full therapeutic dose (Increase RTV until it reaches the same dose as LPV in mg , in a ratio of 1:1

8.6.3 Anti-Tuberculosis/Antiretroviral Drug Toxicities

- ARV agents and TB drugs, particularly INH, rifampicin, and pyrazinamide, can cause drug-induced hepatitis. Clients receiving potentially hepatotoxic drugs e.g. NVP should be monitored frequently for clinical symptoms and signs of hepatitis and have laboratory monitoring for hepatotoxicity.
- Peripheral neuropathy can occur with administration of INH, or stavudine (d4T) or may be a manifestation of HIV infection. All clients receiving INH also should receive supplemental pyridoxine to reduce the risk of peripheral neuropathy.

8.6.4 Immune reconstitution inflammatory syndrome (IRIS) with TB and ART

- IRIS is more common in clients with advanced HIV disease (particularly those with a CD4 count less than 50 cells/mm3 or 10% in children) in the first few weeks of starting HAART. This is due to unmasking of a previously occult opportunistic infection by the improving immune function. Previously diagnosed disease may also get worse (paradoxical IRIS).
- Clients with mild or moderately severe IRIS can be managed symptomatically. Those with severe IRIS can be treated with corticosteroids.
- In the presence of IRIS, neither TB therapy nor ART should be stopped because both therapies are necessary for the long-term health of the client.

8.7 MULTI-DRUG RESISTANT (MDR) TB AND HIV

- MDR-TB is defined as TB that is resistant to at least isoniazid and rifampicin
- PLHIV with suspected MDR-TB should have drug sensitivity testing performed. Where possible, use Xpert MTB/RIF (GeneXpert) since this is more sensitive for detecting TB among PLHIV and rapidly detects rifampicin resistance.
- All clients with HIV and MDR-TB should be initiated on ART irrespective of CD4 counts
- Refer clients to specialized TB treatment centers for specific MDR anti-TB medication

9 HIV PREVENTION BASED ON ARV DRUGS

Prevention of new HIV infections remains the cornerstone in HIV control in the absence of a cure. This will be achieved through implementation of Combination Prevention – a mix of biomedical, behavioural and structural interventions.

Behavioural interventions reduce the frequency of potential transmission events. These include Behavioural Change Communication (BCC) programs designed to encourage people adopt safer sex behavior such as delay in sexual debut, reduction in number of sexual partners, use of male and female condoms correctly and consistently, and knowledge of ones' HIV status and that of sexual partners.

Structural and supportive interventions affect access to, uptake of and adherence to behavioural and biomedical interventions. Such interventions address the critical social, legal, political and environmental enablers that contribute to HIV transmission, including legal and policy reform, measures to reduce stigma and discrimination, the promotion of gender equality and prevention of gender-based violence, economic empowerment, access to schooling and supportive interventions designed to enhance referrals, adherence, retention and community mobilization. The rest of this chapter will focus on biomedical interventions.

Antiretroviral drugs (ARVs) are used as additional tools in combination prevention. Effective ART decreases the level of plasma HIV viraemia and has been associated with reduction in levels of HIV viraemia in seminal fluids, vaginal fluids, and breast milk. Through a reduction in maternal plasma viraemia, ART given to a pregnant or breast feeding woman reduces the risk of HIV transmission to her unborn baby (See Chapter 6). Among sero-discordant couples, ART is effective in reducing HIV transmission risk by up to 96%. For Pre-exposure and Post-exposure prophylaxis, see below.

9.1 PRE-EXPOSURE PROPHYLAXIS

Pre-exposure prophylaxis (PrEP) is the use of ARVs by uninfected people to avoid HIV acquisition. The ARV drugs may be administered orally, or topically as a vaginal gel (microbicide). The routine use PrEP for the uninfected partner in sero-discordant couples is currently not recommended in South Sudan as additional research on PreP is ongoing.

9.2 ART FOR PREVENTION AMONG SERO-DISCORDANT COUPLES

- Among sero-discordant couples, ART *(for the HIV-infected partner)* is effective in reducing HIV transmission risk by up to 96% to the uninfected sexual partner.
- Provision of ART for prevention among discordant couples requires provision of couple HTC in order to identify the discordant couples, followed by linkage to ART.
- The recommended regimens are similar to the standard ART regimens for adults Table 4-4
- Follow-up of couples is important to monitor for HIV seroconversion.

9.3 POST-EXPOSURE PROPHYLAXIS (PEP)

Post-exposure prophylaxis is short-term use of ARVs to reduce the likelihood of acquiring HIV infection after potential exposure either occupationally or through sexual intercourse.

9.3.1 Post – exposure Prophylaxis (PEP) in the Occupational Setting

To minimize the risk of exposure to HIV contaminated blood or body fluids in the health care setting, standard precautions should be observed: all blood and blood stained body fluids should be treated as if contaminated with HIV and other blood borne viruses such as Hepatitis B and C.

The following precautions should always be taken;

- Use of appropriate barriers such as gloves, gowns and goggles
- Care with sharps including minimizing blind surgical procedures and proper handling and disposal of sharps
- Safe disposal of contaminated waste
- Safe handling of soiled linen
- Adequate disinfection procedures
- Universal Hepatitis B vaccination of non-immune at risk groups including health care workers, police and prison staff, and rescue workers

Basic steps in the clinical management of PEP in the occupational setting:

- First aid / Immediate care
- Establishing eligibility for PEP
- Counselling and obtaining informed consent
- Prescribing and dispensing PEP medication
- Conducting laboratory evaluation
- Ensuring record-keeping; and
- Providing follow-up and support

I. Immediate care - *depends on type and site of exposure*

After a needle stick or sharp injury

- Do not squeeze or rub the injury site
- Wash the site immediately with soap or mild disinfectant (chlorhexidine gluconate solution)
- Use antiseptic hand rub/ gel if no running water
- Don't use strong irritating antiseptics (like bleach or iodine)

After a splash of blood or body fluids in contact with intact skin

- Wash the area immediately
- Use antiseptic hand rub/ gel if no running water
- Don't use strong irritating antiseptics (like bleach or iodine)

After a splash of blood or body fluid in contact with eye(s):

- Irrigate the exposed eye immediately with normal saline or water
- Sit in a chair and let a colleague help you to rinse the eye with water, and pulling up and down the eye lid
- Do not use soap and disinfectant in the eye
- In case of contact lenses: leave them in, while cleaning the eye. Remove them later and clean them in the usual way.

After a splash contacts the mouth:

- Spit the fluid out immediately
- Rinse the mouth thoroughly, using water or saline, and spit again.
- Repeat this several times
- Do not use soap or disinfectant in the mouth

II. *Establish eligibility for PEP:*

Individuals are eligible for PEP if:

- Exposure occurred within the past 72 hours, and
- the exposed individual is not infected or not known to be infected with HIV, and
- the 'source' is HIV-infected or has unknown HIV status, and
- exposure was to blood, body tissues, visibly blood-stained fluid, cerebrospinal fluid, synovial fluid, pleural fluid, peritoneal fluid, pericardial fluid or amniotic fluid, and
- exposure penetrated the skin with spontaneous bleeding or deep puncture or splash of significant amount of fluid to mucous membrane or prolonged contact of an at-risk substance with non-intact skin and
- If the skin was penetrated, exposure was from a recently used hollow bore needle or other sharp object visibly contaminated with blood.

III. Counsel and obtain informed consent:

- Counseling should address benefits and risks of PEP, the risk of acquiring HIV infection from the specific exposure, importance of adherence, drug side effects, and risk of HIV transmission.

IV. Prescribe and dispense PEP medication;

- For recommended regimens, see Table 10-1
- Provide adherence information and support
- A complete course of PEP comprises 28 days of ART
- The first doses should not be delayed by baseline HIV Testing: starter packs of medicines may be used especially in emergency settings and at lower facility levels

Table 9-1: Recommended Regimens for Post-Exposure Prophylaxis for HIV

Preferred	Alternative
TDF + 3TC (or FTC) + EFV	TDF + 3TC (or FTC) + LPV/r

V. Conduct laboratory evaluation:

- Perform HTC using standard algorithm Figure 2-1. Performing HIV testing minimizes the use of PEP for people who are already infected with HIV, thereby reducing drug waste and possible drug side effects. In addition, when the source person tests negative for HIV infection and is unlikely to be in the window period, this prevents the exposed person from having to take PEP unnecessarily.
- If HTC test results are not immediately available, PEP should be prescribed based on the risk evaluation and the likelihood that the source person is HIV positive; further evaluation should be made after the test results are known.
- People who have a positive rapid test result should be referred into HIV care
- Where possible Hepatitis B testing should be done followed by vaccination B if test is negative.
- Other desirable lab tests include pregnancy testing for women of childbearing age

VI. Ensure proper record-keeping:

- Proper documentation and reporting of event and client management.
- Maintaining the confidentiality of client data

VII. Provide follow-up and support:

- To monitor adherence and manage side effects
- Perform follow-up HIV testing after 3-6 months after exposure to exclude sero-conversion
- Provide or refer for counseling and psychosocial support

9.3.2 HIV PEP for people who have been sexually assaulted

Eligibility criteria for PEP following sexual assault:

- less than 72 hours has elapsed since exposure; and
- the exposed individual is not known to be HIV infected; and
- the person who is the source of exposure is HIV infected or has unknown HIV status; and
- a defined risk of exposure, such as: receptive vaginal or anal intercourse without a condom or with a condom that broke or slipped; or contact between the perpetrator's blood or ejaculate and mucous membrane or non-intact skin during the assault; or receptive oral sex with ejaculation; or the person who was sexually assaulted was drugged or otherwise
- unconscious at time of the alleged assault and is uncertain about the nature of the potential exposure; or the person was gang raped.

NB: The clinical management is only one of the components of care needed.

Table 9-2: Clinical Management of HIV Post-exposure Prophylaxis

Item	Recommended action and notes
Immediate care / First aid	- Depends on type and site of exposure
Establish PEP eligibility	- Exposure occurred within the past 72 hours - Exposed individual not known to be infected with HIV - Significant exposure - Person who was the source of exposure is HIV infected or has unknown HIV status
Informed consent for PEP	- Information about risks and benefits - Consent may be given verbally
ART Regimen	- See Table 10-1
Time to initiation	- The initial dose of antiretroviral medicines should be given as soon as possible but no later than 72 hours after exposure
Duration of therapy	- 28 days
HIV testing and counseling	- Baseline HIV test in exposed person - Follow-up HIV testing 3–6 months after exposure - Rapid HIV test of the source person if feasible and based on informed consent and standard operating procedures
Additional laboratory evaluations	- Pregnancy testing - Hepatitis B screening if available
Counseling	- For adherence; side effects; risk reduction; trauma or mental health problems; and social support and safety
Referral	- As appropriate
Record-keeping	- Maintain accurate, confidential records
Follow-up	- Assess and manage side effects - Assess and support adherence - HTC after 3-6 months

9.4 OTHER BIOMEDICAL INTERVENTIONS

- Male and female condoms: Male condoms reduce heterosexual transmission by at least 80% if used correctly and consistently. Female condoms have a similar prevention benefits.
- Voluntary Medical Male circumcision reduces acquisition of HIV by men by up to 66% and offers lifelong protection.

10 LABORATORY TESTS FOR HIV AND AIDS

10.1 INTRODUCTION

Laboratory tests are useful in pre-treatment assessment as well as in monitoring clients on treatment. Lack of access to these tests should however not be a barrier to treatment initiation. Where tests are not available on site, arrangements should be made to transport specimens to facilities with capacity to perform the tests. The need for Point of Care (POC) technologies is key for ensuring rapid diagnostic results in settings with limited access to laboratory services. In the event that laboratory resources do not permit the full range of 'desirable' tests, minimum 'recommended' tests can be done.

Table 10-1: Lab Monitoring Schedule for Clients Before and after ART Initiation

	HCT	Follow-up in Pre-ART care	ART initiation (Baseline)	Receiving ART	Treatment failure	Clinically indicated
Recommended tests						
HIV serology	DNA-PCR for infants<18/12	If not confirmed	If not confirmed			
TB Screening						
Pregnancy screening +/- test						
CD4 testing		Every 6/12		Every 6/12		
HIV viral load[a]						
Desirable tests (performed where available)						
Hb[b], CBC with Differential			On AZT	On AZT		
Urine glucose by dipstix[c] and serum creatinine						
Blood glucose						
LFTS – ALT[d]			On NVP	On NVP		
HBV serology[e]						
Serum CrAg[f]			If CD4 ≤100 cells/mm^3			
Screening for STIs						

[a] Targeted viral load testing for suspected treatment failure

[b] Hb is a desirable test among children and adults with a high risk of adverse events associated with AZT (with pre-existing anaemia, low CD4 or low BMI). Also recommended for pregnant and breast-feeding women in MCH settings,

[c] Urine dipstix and serum creatinine may be considered among people with a high risk of adverse events associated with TDF: (with underlying renal disease, older age group, low BMI, diabetes, hypertension and concomitant use of a boosted PI or potential nephrotoxic drugs).

[d] Desirable among people with a high risk of adverse events associated with NVP, such as being ART-naive women with HIV with a CD4 count >250 cells/mm3 and HCV co-infection. However, liver enzymes have low predictive value for monitoring NVP toxicity.

[e] If feasible, HBsAg testing should be performed to identify people with HIV and HBV co-infection and who therefore should initiate TDF-containing ART.

[f] Can be considered only in settings with a high prevalence of cryptococcal antigenaemia (>3%)

10.2 TESTS FOR HIV DIAGNOSIS

- *See Section 2.5*

10.3 TESTS FOR HIV DISEASE STAGE

CD4 cell Count:

- CD4 cell count serves as a marker of the degree of immunosuppression in clients with HIV. It is also a prognostic indicator for clients initiating ART.
- Assessment of CD4 cell count is still necessary to guide ART initiation outside certain clinical conditions where client are eligible regardless of CD4 count. While the measurement of CD4% is preferable for children <5 years, CD4 cell count is not a requirement for ART initiation in this age group.
- CD4 testing is particularly useful in asymptomatic HIV positive clients some of whom may be severely immuno-compromised and eligible for treatment.
- CD4 testing is recommended in pre-ART, while on ART, and in suspected treatment failure.
- CD4 testing should be carried out:
    - At entry into HIV care, thereafter at 6-monthly intervals as part of ART eligibility assessment while in care.
    - At ART initiation as a baseline test
    - At 6-monthly intervals while on ART
    - Whenever treatment failure is suspected – see 4.7
- CD4 testing performed immediately after the HIV diagnosis enhances linkage to HIV care and treatment and should be encouraged where available.

10.4 TESTS FOR MONITORING RESPONSES TO ANTIRETROVIRAL TREATMENT

10.4.1 Tests for Monitoring Disease Progress and Treatment Safety

Successful ART results in decrease in viral load, immune recovery and a rise in CD4 cell count.

Recommendation:

- Viral load monitoring is recommended as the preferred monitoring approach to diagnose and confirm ART treatment failure.
- If viral load testing is not routinely available, CD4 count and clinical monitoring should be used to diagnose treatment failure.

CD4 monitoring:

- CD4 testing should be performed as part of the baseline assessment at ART initiation, and thereafter performed after every 6 months to assess effectiveness of ART
- An increase of 100-150 CD4 cells/mm^3 in the first 6-12 months is typically seen in an ARV drug-naïve, adherent client.
- In suspected treatment failure, CD4 should be performed following the clinical assessment to confirm immunological failure. See Table 4.8

Viral Load (Virological) assessment

- HIV viral load (VL), is a more reliable tool for monitoring adherence to treatment and efficacy of ART than CD4 cell counts: *where available, viral load should be performed routinely after 6 months on ART, and thereafter annually*. Where viral load is routinely available, CD4 monitoring could be reduced or stopped altogether.
- Viral load should be undetectable (full virological suppression) after 6 months of initiating effective ART, although clients starting treatment with very high viral loads may take longer than this to achieve full suppression; even in these clients the fall in viral load at 6 months should still exceed 2 logs.
- Capacity for viral load measurements is currently limited in South Sudan, and viral load estimations can only be performed in a few specialized centres. For this reason, VL testing in South Sudan is recommended when confirming treatment failure in all clients on ART i.e. 'targeted viral load testing'.
- *Virologic failure is defined as having plasma viral load above 1,000 copies/ml based on two consecutive viral load measurements at least 3 months apart, with adherence support.* If HIV RNA is over 1,000 copies/ml in clients suspected to have treatment failure, adherence concerns should be addressed, and viral load testing repeated after 3 months. If still high, then switch to second line and re-test by 4 to 8 weeks until suppression to <200 copies/mL, then every 6 months.

10.4.2 Tests for Monitoring Antiretroviral Treatment Safety (Toxicity)

Antiretroviral drugs are known to produce side effects in some clients Clinical follow-up, supported by laboratory investigations, is crucial. The frequency of monitoring depends on the ART regimen used. See Table 11.1 and Table 12-3

Haemoglobin (Hb):

- This is a desirable test to perform in clients on AZT-containing ART regimens. Most AZT-related anemia occurs within the first 3/12 of treatment, is more common in women, those with pre-existing anemia, low body weight, and low CD4 counts/advanced HIV disease.
- In these clients, a full blood count (FBC) or Hb estimation should be performed at baseline, month 3 and 6-monthly thereafter.
- Hb test is recommended for pregnant and breast feeding women as part of the MCH care package. Hb may also be performed when clinically indicated in clients with anemia, renal impairment etc.

Alanine amino transferase (AL T):

- It is desirable to perform ALT test at enrolment on ART as a baseline test in anticipation of hepatotoxicity may be caused by some drugs especially NVP.
- If ALT is high, do not give NVP but use EFV, and test for Hepatitis B and C if available.
- NVP- related hepatotoxicity is more likely to occur in women if CD4 count at treatment initiation with NVP is >250 cells/mm^3; close monitoring is therefore essential.
- ALT is a recommended test after 1-2 months of treatment when NNRTIs especially NVP are used. If normal, repeat the test at 3 months, 6 months and thereafter at 6-monthly intervals or earlier if clinically indicated.

Serum creatinine:

- A desirable test in monitoring renal function in clients at high risk of TDF toxicity. Advisable to carry out at baseline as well as regular follow up renal function tests for high risk groups (older people, those with underlying renal disease, long term diabetes, and clients with long standing hypertension, concomitant use of PIs or nephrotoxic drugs). For these categories, perform serum creatinine at baseline, month 3 and 6, 1 year then every 12 months if on TDF.
- Routine blood pressure monitoring maybe used to assess hypertension
- *Urine dipsticks* may be used to detect glycosuria or severe renal toxicity in individuals without diabetes taking TDF -based regimens.
- Do not give TDF if estimated GFR is less than 50ml/minute or in long term diabetes, uncontrolled hypertension and renal failure. Can substitute with AZT.
- For clients with renal disease, more frequent monitoring may be indicated e.g. clients with proteinuria, decreased glomerular dysfunction) or clients with diabetes, hypertension who are increased risk of renal insufficiency

10.4.3 Tests for Diagnosing Opportunistic and other concurrent infections

Common opportunistic infections and the related laboratory investigations are covered in Table 3-5.

TB screening and evaluation:

- It is recommended that TB screening and evaluation (where necessary) should be performed at every clinic visit including pre-ART care, and while on treatment using the screening algorithms in Figure 12-1 and Figure 12-2. Evaluation for TB with specific laboratory testing is guided by the TB screening algorithm. Laboratory capacity for TB Acid fast bacilli (AFB) and general microscopy exists at all hospitals and majority of health centres.

HBV testing:

- Desirable test that should be performed at enrolment into HIV care in HBV endemic regions. Clients co-infected with HIV and HBV requiring treatment for HBV should be initiated on ART immediately irrespective of CD4 count or clinical stage, using a TDF-3TC (or FTC) regimen. If HBsAg, and HBsAb, and anti-HBc are negative at baseline, hepatitis B vaccine should be administered where available.

Cryptococcus antigen testing:

- Desirable test in clients with low CD4 count is ≤100 cells/ml since they are more likely to have latent infection in endemic regions. see 3.5.4

10.5 LABORATORY SAFETY PROCEDURES

Adherence to safety precautions in the laboratory is required at all steps, including specimen collection, storage, transportation and disposal of biohazard wastes, so as to minimize occupational risks such as the risk of transmission of HIV, hepatitis B virus (HBV) and other blood-borne disease agents. All specimens should be treated as infectious.

10.5.1 Sample Storage Procedures

All samples should be stored in tightly closed, labelled tubes and kept in an upright position in racks. Workers must observe temperature requirements during specimen storage, keep a record of all samples, and always dispose used or old specimens in a timely fashion by autoclaving and incineration.

10.5.2 Sample Transportation Procedures

Whenever the capacity for a particular test does not exist in the laboratory on-site, the laboratory staff should make efforts to prepare samples for transportation to the nearest facility with such capacity.

When transporting samples from the clinic to laboratory or from one laboratory to another, the following should be observed:

- Specimens should be packaged appropriately according to the Standard Operating Procedures (SOPs) and put in appropriate and safe containers before transporting them by road (bus or vehicle) or air.
- Dried Blood Spot (DBS) samples on blotting paper are considered to be non-infectious and can be put in a letter envelope and transported by mail or courier. Consult courier and receiving laboratory for procedures and timing.
- A specimen delivery checklist should be used to verify that there is a requisition form for all samples transported.
- Dispatch and receipt records of transported samples should be maintained.

11 HEALTH SYSTEMS IN SUPPORT OF GUIDELINES IMPLEMENTATION

The MOH will provide leadership in the operationalization of these guidelines and will engage with key stakeholders to develop detailed implementation plans.

11.1 MONITORING AND EVALUATION

The Ministry of Health (MoH) will monitor implementation of these guidelines through routine service data collected in the Health management Information System (HMIS), as well as specialized periodic surveys, surveillance, census and vital statistics, and research. There are standardized data collection and monitoring tools for reporting on HIV prevention, care and treatment data. See Table 12-1

Table 11-1: Client care and health facility records collection tools

	HIV care /ART care	MCH/PMTCT	TB/HIV
Client held cards	HIV care/ Appointment card	Maternal /Child Health card Mother child booklet /passport with PMTCT code. HIV care / Appointment card	TB card HIV care / Appointment card
Facility held cards	HIV care /ART card	Labour record/ Partogram card/ form. HIV care /ART card	TB treatment card HIV care /ART card
Registers tracking diagnostic tests	HCT register (PITC, VCT)	ANC , labor and delivery registers (contains PMTCT data)	TB lab & Presumed TB registers
Longitudinal care and treatment registers	Pre-ART and ART registers	ANC and L&D registers HIV-exposed Infant register	Basic Management Unit TB register
Reporting tools	Monthly summary form Cohort reporting form	Monthly summary report	Monthly summary report on Case finding, Treatment outcome

- Other data collection tools include: commodity management tools used for ordering medicines, reagents and supplies; drug dispensing logs; appointment registers; referral forms; supervision checklists

- *At the health facility*, the responsibility of completing the client-held cards, facility held cards, registers, reporting tools etc. primarily rests with the nurse-in-charge of the clinic ensuring all tools are completed; reports are accurate, and submitted in a timely manner to the state/district. Personnel to support the process include:
  - *Records clerks:* responsible for issuing of cards / registers, filling clients ' demographic data in cards, extracting register data into reporting tools, filing /retrieval of client records, and submission of reports
  - *Health care providers* (nurses, clinicians, nutritionists, social workers): responsible for completion of information on the client held card, facility held cards and registers, preparing cohort summaries, and completing client referral as needed
  - *Pharmacists/ pharmacy technicians:* complete the drug inventory records, drug dispensing details for each client, and prepare and submit supplies orders

- *At the State level*, the HIV/AIDS coordinator prepares the state program summary report for onward submission to MOH headquarters.

- MOH is responsible for production of monthly, quarterly and annual reports using data from the HMIS. The performance indicators are detailed in the National HIV/AIDS Strategic Plan.

11.2 HEALTH WORK FORCE

The provision of HIV prevention, care and treatment services requires a multidisciplinary team of health care providers at the different levels of service delivery. The major roles of each team member are described in the table below;

Table 11-2: Summary of the roles and responsibilities of staff in ART sites

Cadre	Roles and responsibilities
Medical Officers / Clinical Officers	Clinical supervision and facility / district management Management of HIV clients in all aspects*
Nurses, midwives	Nursing care Triage of clients Continuation of clinical care of stable clients Adherence counseling supervision and training of community workers Post pharmacy counseling
Nutritionists	ᵠNutritional assessment, counselling, and support
Laboratory technologists /technicians	Phlebotomy Lab services provision Lab commodity management
Counselors	**Counseling for HIV testing Client education **Adherence counseling
Community health workers	Community and home treatment support including tracing clients lost to follow up and missed appointments
Health records information officers / data clerks	Client records management
Pharmacist/ pharmacy technicians	Adherence counseling, rational drug prescription (following national treatment guidelines), ARVs dispensing, effective commodity/inventory management
Store keeper	Commodity management (with lab and pharmacy staff)
Social worker and /or community health worker	Adhere support Defaulter tracing Community linkage Health education

- Due to staffing shortages especially at primary health facilities, task shifting (of responsibilities) will be adopted to support service delivery:
  - *Nurses and midwives may initiate ART and manage clients on HIV treatment;
  - **Counselling, ᵠnutritional assessment and support may be provided by any cadre with the requisite training;
  - Community based organizations and PLHIV may provide services such as counselling support, client tracing, and health education

- Task shifting will be supplemented by mentorship, on-going support supervision, and continuous quality improvement.

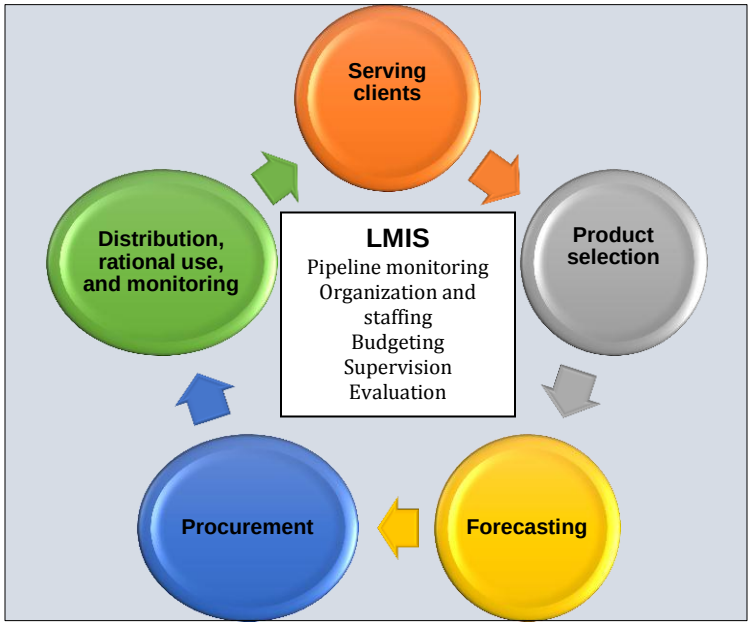
- To ensure quality services' delivery, all staff is expected to have undergone basic training in provision of HIV services – prevention, care and treatment.

- Guidelines, job aids, and SOPs should be provided to support consistent service quality.

11.3 SUPPLY CHAIN MANAGEMENT SYSTEMS

Ensuring adequate and continuous availability of quality and affordable essential medicines, diagnostics and other consumables at service delivery sites is a critical role of procurement and supply management systems. For HIV services, commodities include ARV drugs, laboratory reagents, HIV testing kits, cotrimoxazole among others. Figure 12.1 below outlines the key activities in the logistics management cycle.

Figure 11-1: The Logistics Cycle



At national level:

- The selected products/commodities required for HIV services delivery (ARV drugs, HIV testing kits, cotrimoxazole, and lab reagents) have been specified in national guidelines.
- The *procurement, supply, storage and distribution systems* should ensure uninterrupted availability and minimize loss due to damage and expiry, theft and fraud
- *Quantification & forecasting:*
    - Coordinated centrally by MOH.
    - Estimates short, medium, and long term requirements
    - Requires reliable data on consumption, and stock status from health facilities/ sites
    - Should take into consideration the revised treatment guidelines such as the newly introduced ARV drug regimens, and phase out of D4T.
- *Procurement:* Coordinated by the MOH. On receipt of supplies in the country, there is clearance at port of entry and payment of taxes. There is also physical inspection on arrival of each consignment with random sampling for lab testing by the regulatory body responsible for ensuring quality. See list of ARV formulations approved for procurement in South Sudan in Table 12-3 and Table 12-5

At facility level:

Effective commodity management by the relevant health care workers is critical to ensure continuous availability of supplies and program quality. The staff should promote good inventory management practices and rational use of commodities utilizing all the necessary tools such as SOPs.

i. *Ordering / requesting of commodities*: The facility is responsible for ordering commodities in an appropriate and timely manner based on facility-specific requirements. Quantities to be ordered should be determined by past consumption and projected future need.
ii. *Receiving, storage, and issuing of commodities*: Items in stock should always be stored in a proper storage place. The store should be secure, in good condition, and well organized. All supplies should be kept in the store and requisitions made for what is required for dispensing. Receipt, storage and issuance of commodities should follow set down SOPs. Accurate inventory records should be maintained.
iii. *Dispensing of medicines*: When a medicine is given to a client, it is important to ensure the client has received the right medicine, the correct quantity, correct information on how to take the medicine, and correct information on how to store the medicine.

Inventory control:

- Should happen at all storage levels central, intermediate and at facility. This ensures stock status monitoring- (tracking of quantity and use span of commodities to determine how long supplies will last).
- Inventory control helps detect potential stock-outs/ expirations and enables appropriate and timely action particulary for ARV drugs. The information needed includes:
    - stock on hand – through performing physical inventory or looking at the stock card
    - monthly consumption - dispensed to user or consumption data and issues data
    - stock status

Rational use and monitoring pharmaceuticals

- Providers at facilities have to be adequately trained in rational drug use
- Systems for monitoring and reporting , including monitoring adverse effects (pharmacovigilance) feed into the selection of products, rational use, prescription, and forecasting. See the list of ARVs approved and available in South Sudan in Table 12-3

Logistics Management Information systems (LMIS)

- Critical for monitoring the supply chain
- Essential LMIS data items include – stock on hand, consumption, losses and adjustments, service statistics
- Sources of LMIS data include; stock keeping records; transaction records; consumption records; reports

Recommended antiretroviral formulations for procurement

A consolidated antiretroviral formulary should include both recommended drugs and formulations which are solid, heat-stable, and fixed dose combinations whenever possible. Liquids, even for children, are often difficult to administer, store, transport, and are frequently more sensitive to temperature. Solid child-friendly formulations, which can be crushed or dispersed in water, are available and more optimal for clinical environments in South Sudan.

Table 12-3 shows the recommended first-line antiretroviral regimens for treatment of HIV infection when initiation criteria are met.

Table 11-3: Recommended 1st line regimens for treatment of HIV infection

Client Population	Antiretroviral regimen	Comments
Children <3yo	Abacavir Lamivudine Nevirapine	Efavirenz currently not recommended for use in children <3yo
Children 3-9y	Abacavir Lamivudine Efavirenz	Can be dosed once-daily
Children 10y & Older	Tenofovir Lamivudine Efavirenz	Once-daily dosing
Adults (including pregnant women)	Tenofovir Lamivudine (or Emtricitabine) Efavirenz	Once-daily dosing
HIV-exposed infants	Nevirapine syrup	Once-daily dosing
Post-exposure prophylaxis	First-line regimen for 28 days	

- Using the consolidated formulary, all first-line HIV treatment needs for children and adults, as well as post-exposure prophylaxis, can be met with 4 relatively easy-to-administer drug commodities
- Alternative regimens are zidovudine-based in the proposed formulary consolidation.
- Unless there is a medical contraindication, it is recommended clients not on these regimens be switched to them in order to simplify the supply chain and improve the likelihood the client will continue to access treatment without excessive future drug and formulation switches. Regimen switches should be minimized thereafter within the available formulary unless indicated by treatment guidelines for toxicity or treatment failure.

Transition to new ARV regimens

Implementation of these guidelines requires smooth transition to new recommended regimens while minimizing wastage or expiry of ARVs that are no longer recommended such as d4T. To ensure that supply of ARV drugs is uninterrupted, a phased program will be implemented.

- 'New' ART-eligible adults should receive the preferred 1st line – TDF-based regimen as of June 2014
- Clients currently receiving D4T-based regimens should be transitioned to a TDF-based 1st line regimen June 2014
- Clients with evidence of treatment failure should shift to a TDF-based 2nd line regimen
- People currently on AZT or NVP-based regimens should continue on their current regimen as long as it is safe and effective.

Bundling PMTCT packs

Given the challenges in access to facilities, and based on experience from HIV programs impacted by conflict, strong consideration should be given to bundling PMTCT-packs to be provided during the first ANC which includes all ARVs and CTX needed, including one bottle of NVP syrup for the infant.

Table 11-4: Bundled PMTCT medications for sites implementing Option B+

Population	Antiretroviral Formulation	Dosing	Comment
HIV-infected pregnant and breastfeeding women	Tenofovir/Lamivudine/Efavirenz tablet (300mg/300mg/600mg) CTX 960mg tablet	1 tablet once daily	Same regimen as for adults
HIV-exposed infants	Nevirapine syrup 10mg/ml	Weight and age dosing	For the first 6 weeks of life
	CTX 120mg scored tablet		From 6 weeks through final diagnosis

Roll-out of Option B+

- Transition to Option B+ (from Option A) will greatly simplify the supply chain for ARVs
- Roll-out will be in a phased manner beginning with facilities that are already providing PMTCT and ART
- Site preparation for Option B+ accreditation will include training of providers, on-going mentorship, and establishing systems to support ART adherence and retention on treatment.
- The 22 sites that are already providing ART will be prepared to support comprehensive PMTCT services including ANC, PICT in ANC, maternity and PNC, linkage to HIV care and immediate treatment.
- Existing PMTCT sites will be capacitated to provide Option B+ and ART to all population groups including adults, children, infants and TB clients.

Additional General Considerations

- ***Buffer stock and multiple month drug disbursements:*** Procurements and buffer stock that allows for clients to receive a 3-month medication supply is optimal to maximize maintenance of therapy during periods of erratic service or commodity delivery. Increasing buffer stock, accessible at State or regional level, is recommended as feasible during periods of increased logistical challenges with transporting commodity out of the central warehouse.

  Treatment interruption due to supply chain challenges: Treatment interruptions either due to insufficient stock at the ART site or due to unexpected displacement of an individual and lack of access to ART supplies increase the risk of ARV resistance. This should be avoided whenever possible.

Table 11-5: List of formulations for procurement (ARVs, Cotrimoxazole

Formulation (ARVs, Cotrimoxazole, etc)	Dosing[1]	Comment
First-line ARVs		
TDF/3TC/EFV tablet (300mg/300mg/600mg)	Adult/adolescents: 1 tablet once daily	Adolescents and Adults: 1 tin = 1 treatment month
TDF/FTC/EFV tablet (300mg/200mg/600mg)	Adult/adolescents: 1 tablet once daily	Adolescents and Adults: 1 tin = 1 treatment month
TDF/FTC (300mg/200mg)		
TDF/3TC	Adults and adolescents 1 tab od	Adolescents and Adults: 1 tin = 1 treatment month
EFV 600 mg tablet		
ABC/3TC dispersible tablet (60mg/30mg)	Pediatric weight band dosing	
EFV 200mg tablet (scored)	Pediatric weight band dosing	
Nevirapine 50mg tablet (dispersible)	Pediatric weight band dosing	
Alternative First-line and PMTCT ARVs		
AZT(300mg)/3TC (150mg) /NVP (200mg)	Adult: 1 tablet twice a day	Alternative regimen for TDF toxicity
AZT/3TC (300mg/150mg) tablets	Adult: 1 tablet twice a day	For use as alternative 1st line NRTI backbone for adults/adolescents.
NVP 200mg tablet	Adult: 1 tablet bd, except with 14-day lead-in dosing	For use in alternative 1st line in situations of EFV toxicity.
AZT /3TC/NVP (60mg/30mg/50mg)	Paediatric	
AZT/ 3TC (60mg/30mg) dispersible tablet	Pediatric weight band dosing	Alternative regimen only -for ABC toxicity
Nevirapine 10mg/ml syrup	Pediatric weight/age band dosing – once daily dosing	For HIV-exposed infant PMTCT only
AZT oral suspension 10mg/ml		
3TC oral solution 10ml/ml		
Cotrimoxazole prophylaxis		
Sulfamethoxazole/trimethoprim 800mg/160mg tablets (Cotrimoxazole 960mg scored tablet)	Child 6-14y: ½ tablet once daily Adult: 1 tablet daily	
Sulfamethoxazole /trimethoprim 100mg+20mg/5ml Cotrimoxazole 120mg scored tablet	Child 6wk-6mo: 1 tablet daily 6mo-5y: 2 tablets daily	For HIV-exposed infants and HIV-infected children
Sulfamethoxazole /trimethoprim 200mg+40mg/5ml		

[1] ***Dosing information for procurement informational purposes only.***

12 ANNEXES

Table 12-1: 1st line ART regimens for adults, adolescents, pregnant & breast-feeding women, and children

First line ART	Preferred first-line regimens	Alternative first-line regimens	Special circumstances*
Adults Including: • Pregnant and breast-feeding women • Adults with TB • Adults with HBV • HIV-infected partners in sero-discordant relationships	TDF +3TC (or FTC) + EFV (as FDC - fixed dose combination)	AZT+3TC (or FTC)+EFV (or NVP) TDF+3TC (or FTC) +NVP	Regimens containing ABC, d4T, and boosted PIs
Adolescents (10 to 19 years) ≥35 kg	TDF +3TC (or FTC) + EFV	AZT+3TC(or FTC)+EFV (or NVP) TDF+3TC (or FTC) +NVP	ABC+3TC (or FTC) + EFV (or NVP)
Children 3 years to less than 10 years and adolescents ≤ 35 kg	ABC+3TC +EFV	ABC+3TC+NVP AZT+3TC (or FTC) +EFV (or NVP) TDF +3TC (or FTC) + EFV (or NVP)	
Children < 3 years	ABC +3TC +NVP	AZT+3TC+NVP	d4T +3TC+NVP

* *Special circumstances may include situations where the preferred regimen or alternative may not be available or suitable because of significant toxicities, anticipated drug interactions, drug procurement and supply chain management issues etc.*

Figure 12-1: TB screening card: adult and adolescent

TB SCREENING CARD: Adult & Adolescent

Screening for TB should be done at every visit

Name of /client_____ Age …… Sex …… Address……

Pre ART/ Unique ART _____ Client ID No. _____

Health Facility _____ State _____ County _____

		Insert dates below					
Adult & Adolescent TB screening questions		___/__/__	___/___/___	___/___/____	___/___/____	____/____/___	___/___/____
1. Current cough (Y/N)							
2. Fever (Y/N)							
3. Weight loss (Y/N)							
4. Night sweats (Y/N)							
Evaluate for TB if "Yes" to any of the above (Positive TB screening)							
Bacteriology : sputum for AFB	Done = Yes/No						
	Result (AFB+, -ve, unknown)						
Radiology: CxR, etc	Done= Yes/No						
	Results (Suggestive, inconclusive, other Dx, unknown ,etc						
FNA, culture, ultrasound, etc	Done : Yes/No						
TB diagnosed	Yes (write type of TB)/ No						

Figure 12-2: TB screening CARD: Children (0-14 years)

TB SCREENING CARD: Children (0-14 yr)

Screening for TB should be done at every visit

Pre ART/ Unique ART _____ Client ID No. _____

Health Facility _____ State _____ County _____

Child TB screening questions		Insert dates below						
		___/__/__	___/___/___	___/___/____	___/___/____	____/____/___	___/___/____	___/___/_____
1. Current cough (Y/N)								
2. Fever (Y/N)								
3. Poor weight gain* (Y/N)								
4. Close contact history with TB client (Y/N)								
Evaluate for TB if "Yes" to any of the above (Positive TB screening)								
Bacteriology : sputum for AFB	Done = Yes/No							
	Result (AFB+, -ve, unknown)							
Radiology: CxR, etc	Done= Yes/No							
	Results (Suggestive, inconclusive, other Dx, unknown ,etc							
FNA, culture, ultrasound, etc	Done : Yes/No							
TB diagnosed	Yes (write type of TB)/ No							

*__Poor weight gain is defined as__: *reported weight loss, or very low weight (weight-for-age less than –3 z-score), or underweight (weight-for-age less than –2 z-score), or confirmed weight loss (>5%) since the last visit, or growth curve flattening.*

Table 12-2: Toxicities associated with first and second line ARV drugs

ARV drug	Major toxicity	Risk Factors	Minor toxicity	Suggested management
ABC	Hypersensitivity reaction	Presence of HLA-B*5701 gene	Lactic acidosis	If ABC is being used as first line ART, substitute with TDF or AZT, of d4T If ABC is being used as second line ART, substitute with TDF
AZT	Anemia, neutropenia, myopathy, lipoatrophy or lipodystrophy	Baseline anemia or neutropenia CD4 count ≤ 200 cells/mm^3	Blue to black discoloration of nails, nausea and headache	If AZT is being used in first line ART, substitute with TDF or ABC. If AZT is being used in second line ART, substitute with d4T. For severe anemia: may transfuse. For myopathy, discontinue if CPK high
d4T	Peripheral neuropathy , lipoatrophy or lipodystrophy	Older age CD4 count ≤ 200 cells/mm^3 Concomitant use of INH or DDI	Insomnia, anxiety, panic attacks	Severe peripheral neuropathy, abnormal serum amylase and transaminases, discontinue therapy
	Lactic acidosis or severe hepatomegaly with steatosis, acute pancreatitis	BMI > 25 (or body weight >75kg) Prolonged exposure to nucleoside analogues		
EFV	Persistent CNS toxicity (such as abnormal dreams, depression and mental confusion)	Depression or other mental disorder (previous or at baseline) Daytime dosing	Dizziness, Rash in 10% but rarely severe <1%	NVP. If the person cannot tolerate either NNRTI, use a boosted PIs CNS symptoms often resolve 2-4 weeks. Stop if hepatitis is confirmed.
	Hepatotoxicity	Underlying hepatic disease HBV and HCV co-infection Concomitant use of hepatotoxic drugs		
	Convulsions	History of seizure		
	Hypersensitivity reaction, Steven Johnson Syndrome Potential risk of neural tube birth defects (very low risk in humans) Male gynaecomastia	Risk factors unknown		
3TC	Peripheral neuropathy, pancreatitis (more common in children)		Skin rash, headache	Do serum amylase, stop if elevated. Restart when resolved or change to ABC
LPV/r	Electrocardiographic abnormaities (PR and QT interval prolongation, torsades depointes)	People with pre-existing conduction system disease Concomitant use of other drugs that may prolong the PR interval	Headache, weakness, diarrhea rarely severe	If LPV/r is used in first line ART for children, use an age appropriate NNRTI (NVP for children younger than 3 years and EFV for children 3 years and older) ATV can be used for children older than 6 years
	QT interval prolongation	Congenital long QT syndrome Hypokalemia		

ARV drug	Major toxicity	Risk Factors	Minor toxicity	Suggested management
		Concomitant use of other drugs that may prolong QT interval		If LPV/r is used in second line for adults, use ATV/r or DRV/r. If boosted PI are contraindicated and the person has failed on treatment with NNRTIs in first line ART, consider integrase inhibitors
	Hepatotoxicity	Underlying hepatic disease HBC and HCV co-infection Concomitant use of hepatotoxic drugs		
	Pancreatitis	Advanced HIV disease		
	Risk of prematurity, lipoatrophy or metabolic syndrome, dyslipidemia or severe diarrhea	Risk factors unknown		
NVP	Hepatotoxicity	Underlying hepatic disease HBV and HCV co-infection Concomitant use of hepatotoxic drugs CD4 ≥250 cells / mm3 in women Cd4 ≥400 cells/mm3 in men First month of therapy if lead in dosing is not used		EFV. If the person cannot tolerate either NNRTI, use a boosted PIs Low-dose over first 2 weeks minimizes rash occurrence. If mild or moderate continue cautiously or substitute with EFV. If severe stop NVP and permanently if hepatitis +ve
	Severe skin rash and hypersensitivity reaction Steven Johnson syndrome	Risk factors unknown		
TDF	Tubular renal dysfunction, Fanconi syndrome	Underlying renal disease older age BMI <18.5 (or body weight below 50kg) Untreated Diabetes mellitus Untreated hypertension Concomitant use of nephrotoxic drugs or a boosted PI		If TDF is being used in first line ART, substitute with AZT or d4T or ABC If TDF is being used in second line ART (after d4T + AZT use in first line ART), substitute with ABC or DDI Monitor renal function at baseline and every 6 months.
	Decreases in bone mineral density	History of osteomalacia and pathological fracture Risk factors for osteoporosis or bone loss		
	Lactic acidosis or severe hepatomegaly with steatosis	Prolonged exposure to nucleoside analogues Obesity		
	Exacerbation of hepatitis B (hepatic flares)	Discontinuation of TDF due to toxicity		Use alterative drug for hepatitis B treatment (such as entecavir)

Table 12-3: Drugs that commonly interact with ARVs

	Drug name	NVP	EFV	TDF	LPV/r
Antimycobacterial	Rifampicin	NVP levels reduced by 20-58% Potential of additive hepatotoxicity Use of this combination is not recommended however if used, careful monitoring should be instituted	EFV level reduced by 25%	No significant change No dose adjustment necessary	Reduces LPV levels by 75% and reduced ritonavir level by 35%. Where available, use rifabutin in place of rifampicin
	Rifabutin	Reduces NVP Levels by 16%. No dose adjustment.	EFV levels unchanged; Rifabutin 35% Dose: rifabutin dose to 450-600 mg Once daily or 600 mg 3x/week. EFV: Standard		Levels: Rifabutin AUC 3-fold. 25 Decrease rifabutin dose to 150 mg once daily or 3x/week LPV/r: Standard.
Antifungal	Ketoconazole	Ketoconazole level reduced by 63% NVP level increased by 15-30% Not recommended to co-administer	No significant changes in ketoconazole or EFV level		Ketoconazole level increased 3-fold Use with caution; do not exceed 200mg/day ketoconazole
	Fluconazole	NVP levels increased by 100% No change in fluconazole level Increased risk of hepatotoxicity if coadministred; monitor closely for NVP toxicity	No significant changes in EFV or fluconazole		
Oral contraceptives	Ethinyl estradiol	Ethinyl estradiol reduced by 20%. Use alternative or additional methods	Ethinyl estradiol levels reduced by 37%. Use alternative or additional methods	No significant change No dose adjustment necessary	Ethinyl estradiol level by 42% Use alternative or additional methods
Lipid lowering agents	Atorvastatin	No data	Atorvastatin AUC reduced by 43% EFV level unchanged Adjust atorvastatin dose according to lipid response, not to exceed maximum recommended dose		Atorvastatin AUC 5.88 fold Use lowest possible starting dose with careful monitoring

Table 12-4: First and Second line ART regimens for infants and children in South Sudan

	Children < 3 years		Children 3 years to less than 10 years and adolescent < 35 years		Adolescents (10-19 years) ≥35 kg	
	First line	**2nd line**	**First line**	**2nd line**	**First line**	**2nd line**
Preferred	**ABC +3TC +NVP**	**AZT + 3TC +LPV/r**	**ABC +3TC+EFV**	**AZT + 3TC +LPV/r**	**TDF +3TC (or FTC) +EFV**	**AZT + 3TC+LPV/r**
Alternative	AZT +3TC +NVP	ABC + 3TC (or FTC) + LPV/r	ABC +3TC +NVP AZT+3TC (or FTC)+EFV (or NVP) TDF +3TC (or FTC) + EFV (or NVP)	AZT+3TC+LPV/r If AZT was used in 1st line, TDF +3TC (or FTC) + EFV (or NVP) If TDF was used in 1st line, AZT/3TC+LPV/r	AZT + 3TC + EFV (or NVP) TDF +3TC (or FTC) +NVP	ABC or TDF + 3TC (or FTC)+ LPV/r AZT + 3TC+LPV/r
Special circumstances		ABC (or TDF) + 3TC (or FTC) + LPV/r	d4T +3TC + EFV (or NVP)	ABC+3TC (or FTC) +LPV/r	ABC +3TC + EFV (or NVP)	AZT + 3TC++LPV/r

NRTI drug combinations to be avoided,

- D4T + AZT, TDF + ddI both drugs work through common metabolic pathways
- TDF +ABC -both drugs select for the K65R mutation
- d4T +ddI -both drugs have overlapping toxicities
- Didanosine (ddI) is anadenosine analogue NRTI which is generally reserved for second-line regimens

Other comments

If a child is anemic (Hb <7.5g/dl) do not use AZT. Use ABC based regimen.
Do not use EFV in children under 3 yrs (or 15 kg).
D4T should only be used if preferred or 1st alternative regimens are contraindicated or missing. All children above 5 years on this regimens should be switched to AZT based regimen

Table 12-5: List of Contributors and Reviewers of these guidelines

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