

THE UNITED REPUBLIC OF TANZANIA



MINISTRY OF HEALTH

**NATIONAL GUIDELINES  
FOR THE CLINICAL MANAGEMENT  
OF HIV AND AIDS**

**National AIDS Control Programme (NACP)  
Second edition, April 2005**

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## LIST OF ABBREVIATION

<b>3TC</b>	Lamivudine
<b>AIDS</b>	Acquired Immune Deficiency Syndrome
<b>ANC</b>	Antenatal care
<b>ART</b>	Antiretroviral treatment
<b>ARV</b>	Antiretroviral
<b>AZT</b>	Zidovudine
<b>BCC</b>	Behaviour Change Communication
<b>CBO</b>	Community based organisation
<b>CD4</b>	Cluster of Differentiation found on a subset of T-lymphocyte
<b>CHBC</b>	Community Home Based Care
<b>CHW</b>	Community Health Worker
<b>CoC</b>	Continuum of Care
<b>CPT</b>	Cotrimoxazole Preventive Therapy
<b>CSF</b>	Cerebrospinal Fluid
<b>CTC</b>	Care and Treatment Clinic
<b>CTU</b>	Care and Treatment Unit
<b>CT Scan</b>	Computerized Tomography Scan
<b>d4T</b>	Stavudine
<b>ddl</b>	Didanosine
<b>DOTS</b>	Directly observed therapy, short course
<b>EDL</b>	Essential drugs list
<b>EFV</b>	Efavirenz
<b>FBO</b>	Faith Based Organisation
<b>FDC</b>	Fixed Dose Combination
<b>PGL</b>	Persistent Generalised Lymphadenopathy
<b>HAART</b>	Highly active antiretroviral therapy
<b>HBC</b>	Home Based care
<b>HIV</b>	Human Immunodeficiency Virus
<b>HIVD</b>	Human Immunodeficiency Virus Disease
<b>IEC</b>	Information, Education, and Communication
<b>IMAI</b>	Integrated Management of Adolescent and Adult Illnesses.
<b>IMCI</b>	Integrated Management of Childhood Illnesses
<b>INH</b>	Isoniazid
<b>IPT</b>	Isoniazid Preventive Therapy
<b>LPV</b>	Lopinavir
<b>M&amp;E</b>	Monitoring and evaluation
<b>MCC</b>	Medicines Control Council
<b>MCH</b>	Maternal and child health
<b>MDR</b>	Multi-drug resistant
<b>MTCT</b>	Mother-to-child transmission
<b>NGO</b>	Non-governmental organisation

<b>NNRTI</b>	Non-nucleoside reverse transcriptase inhibitors
<b>NRTI</b>	Nucleoside reverse transcriptase inhibitors
<b>NSAID</b>	Non Steroidal Anti inflammatory drugs
<b>NVP</b>	Nevirapine
<b>OI</b>	Opportunistic infection
<b>PCR</b>	Polymerase Chain Reaction
<b>PEP</b>	Post-exposure prophylaxis
<b>PI</b>	Protease inhibitors
<b>PL(W)HA</b>	People living with HIV and AIDS
<b>PMTCT</b>	Prevention of mother-to-child transmission
<b>RTV</b>	Ritonavir
<b>SOPs</b>	Standard Operating Procedures
<b>STI</b>	Sexually Transmitted Infection
<b>TB</b>	Tuberculosis
<b>THP</b>	Traditional Health Practitioners
<b>TLC</b>	Total lymphocyte count
<b>TTI</b>	Transfusion Transmittable Infections
<b>VCT</b>	Voluntary counselling and testing
<b>VL</b>	Viral Load
<b>VZV</b>	Varicella Zoster Virus

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## FOREWORD

More than twenty years have elapsed since the HIV and AIDS epidemic was first recognized in Tanzania. During this period, the country has responded in several ways, including formulating and implementing a series of strategic plans and interventions. Many of the initial interventions were geared towards preventing further spread of HIV and AIDS, which was done with little success. However, over time more and more care and support initiatives were introduced and scaled up as interventions became available. These developments notwithstanding, to date the mainstay of managing HIV and AIDS epidemic has remained prevention and advocacy for behaviour change.

Despite of all these efforts, the epidemic has grown and established itself in both rural and urban communities. The epidemic has been more severe in certain vulnerable groups including women, children, youth and migrant populations. As a result of this, more than 2 million people are currently living with HIV and AIDS in the country. This calls for a paradigm shift in our approaches to the epidemic, by strengthening and expanding the care and support component of our interventions. This is what prompted the Government to launch a national programme for care and treatment in 2003. The inclusion of the National Care and Treatment Plan in our current Health Sector Strategy for HIV and AIDS, responds to this shift with the purpose of providing antiretroviral treatment to as many people living with HIV and AIDS (PLHA) as possible.

The National Care and Treatment Plan provide a framework for establishment and scaling up a five year programme that will enrol about 500,000 patients on anti retroviral treatment. This programme will introduce an entirely new intervention that entails training of the entire work force of the health system as well as development of tools to guide safe and effective administration of anti retro viral drugs.

The National Guidelines for Clinical Management of HIV and AIDS is one of the many guidelines that have been developed to provide health care workers guidance on different aspects of care and treatment. This new edition of the National Guidelines for Clinical Management of HIV and AIDS (2<sup>nd</sup> Edition, April 2005); is a revision of the first edition (April 2002), and is expected to provide more detailed and updated information on each areas of the old guidelines. There is a wider coverage on such areas as; Adult and Paediatric HIV and AIDS management; Nutrition; Care of opportunistic infections; Home Based Care and the continuum of care; counselling and HIV testing including adherence issues. There are also added information materials on health facility certification; standard precautions in care settings and laboratory services; post exposure prophylaxis; ARV logistics and dosages. The guidelines can also serve as reading and reference material for a wide range of health professionals – including, but not limited to, counsellors, nutritionists, laboratory technicians, home based care and prevention of mother to child transmission providers as well as clinicians. Essentially the above professionals form part of the HIV and AIDS Care Team as outlined in this document.

HIV and AIDS is a rapidly changing and growing field; we therefore look forward to receiving feedback from the users on areas that need revision and improvement. We count on your views to keep these guidelines up-to-date all the time.



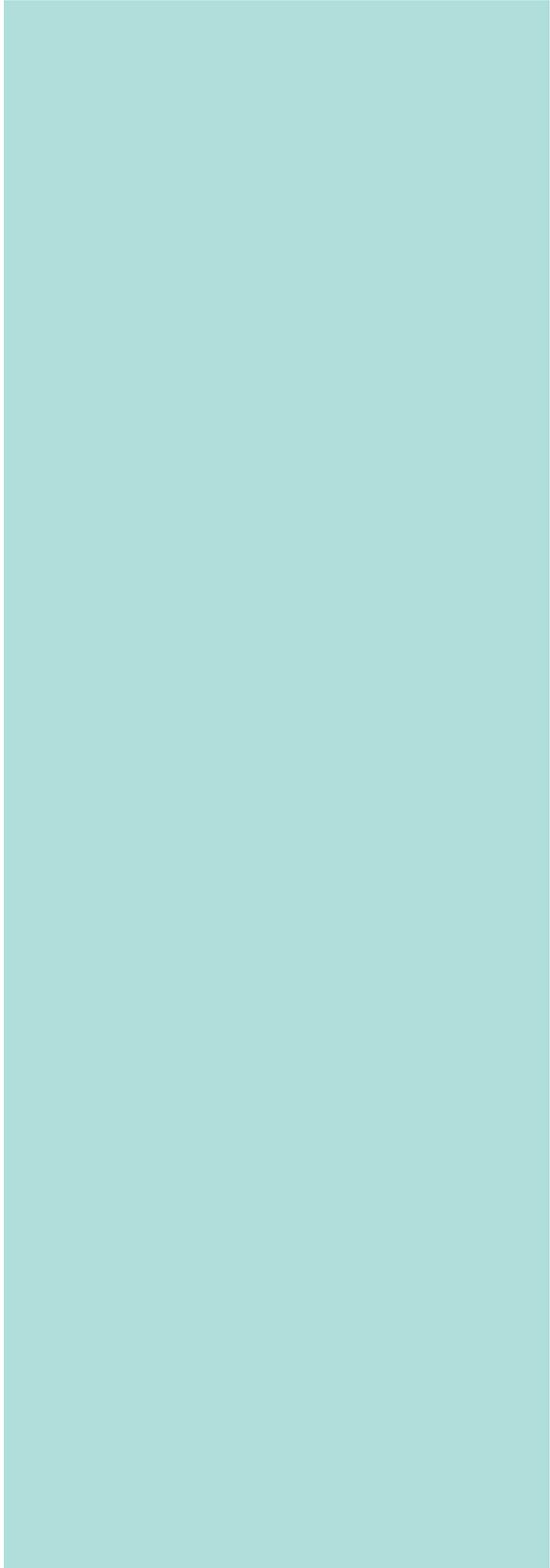
**M. J. Mwaffisi**  
**Permanent Secretary**  
**Ministry of Health**  
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## **Chapter 1**

# Introduction



### 1.1 Epidemiology of HIV and AIDS

HIV and AIDS is a major health problem globally. In 2004, it was estimated that about 40 million people were living with HIV and AIDS worldwide. Sub-Saharan Africa is the world's most severely affected region, with only 10% of the world's population it harbours about two thirds of the global total number of people living with HIV and AIDS. One in 12 adults in this region is reported to be infected with HIV.

Since 1983 when the first cases of AIDS were reported in Tanzania, the HIV epidemic has spread rapidly to all districts and communities affecting all sectors of the society. A total of 18,929 AIDS cases were reported to the NACP from the 21 regions during the year 2003. This resulted into a cumulative total of 176,102 reported cases since 1983 when the first 3 cases were identified in the country.

In 2003 over 1.8 million persons were estimated to be living with HIV and AIDS and close to 800,000 cumulative AIDS cases. The overall prevalence of HIV infection among blood donors during 2003 was 8.8%. Recent data based on household surveys estimate the seroprevalence in adults in Tanzania to be 7%, with a wide variation across the regions. Most infections are transmitted through sexual intercourse and hence the population most severely affected are the sexually active individuals between 15 and 49 years of age. Women have a higher risk to become infected than men.

The impact of the HIV epidemic has been profound and has affected all sectors. Today, HIV and AIDS is recognized not only as a major public health concern, but also as a socio-economic and developmental problem in Tanzania as in most sub Saharan African countries. Data from the Adult Morbidity and Mortality Project (AMMP) in 2002 showed that HIV and AIDS and TB were the leading causes of mortality in Hai, Temeke and Morogoro Rural districts where the study was done.

### 1.2 Impact of HIV and AIDS

#### 1.2.1 Health Impact

The HIV and AIDS pandemic has interacted with other underlying public health problems, most notably tuberculosis. TB remains one of the principal causes of death in persons with HIV infection worldwide. National TB rates have escalated over the past decade in sub Saharan Africa and South-East Asia. Since the mid-1980s, in many African countries with well-organized programs, annual TB notification rates have increased fourfold, reaching peaks of more than 400 cases per 100,000 individuals. In some countries, up to 70% of patients with sputum smear-positive pulmonary TB are HIV-infected. It is reported that in countries of Sub Saharan Africa most admissions are due to HIV related conditions including TB. Most urban districts and regional hospitals in Tanzania report a bed occupancy rate of up to 50-60% for HIV related conditions. The HIV pandemic has reduced resources available for other health problems thus adversely affecting quality of health care services delivered in these countries. In addition, health care personnel are affected as well by the pandemic resulting in human resource crises in hospitals at a time that more resources than ever are needed to start care and treatment programs with ART.

## 1.2.2 Economic Impact

The relationship between HIV and AIDS and economic development is complex. HIV and AIDS negatively affects economic growth on one hand and, a weak economy makes it difficult for nations and individuals to mount adequate and comprehensive responses to the epidemic on the other. In addition, reports show that poverty is a powerful co-factor to the spread of HIV and AIDS. The economically and socially disadvantaged, women, youth and other marginalized groups in the society, are disproportionately affected by the epidemic.

Ill health and death due to AIDS are reported to have reduced agricultural labour force, productivity and disposable incomes in many families and rural communities. Data from Kagera, one of the regions most severely affected by HIV and AIDS in Tanzania, indicate that the annual Gross Domestic Product (GDP) declined from USD 268 to USD 91 between 1983 and 1994 respectively. Although the decline in GDP was multi-faceted, AIDS was believed to be a major cause. Indeed similar trends of declining GDP were associated with reduced agricultural production and increase in number of AIDS cases in Tanga region.

## 1.2.3 Social impact

AIDS is widespread in both urban and rural communities and mostly affects persons at the peak of their sexual and economic activity. Death of a young adult often means loss of a father or/and mother and family's income generator. Studies conducted in Arusha, Kagera and Mwanza regions show a serious and growing breakdown of social network, which have hitherto sustained African societies. Materialistic practices are on the increase; orphans are not only subjected to material, social and emotional deprivation, but also lack of opportunities for education and health care. Widows and orphans are deprived of their inheritance rights by relatives through the application of outdated traditional practices and customary laws. The widows are often blamed for the premature deaths of their husbands.

Despite these challenges experience has shown that the epidemic can be stabilized even reversed, in countries including those with modest resources. Successful programs are characterized by: strong and high-level political leadership for HIV prevention; a national HIV and AIDS strategic plan; adequate funding for HIV and AIDS response; strong and sustained community involvement and initiatives, with supportive policies. Data from Kagera has shown that a combination of all these factors can indeed result in a decline of HIV incidence. Components of a minimum package for HIV and AIDS response are known. They include but are not limited to: blood safety initiatives, STD management and prevention, care and support of people living with HIV and AIDS including access to drugs. Others are functional referral systems and linkages, education to the general community particularly the youth, condom programming, prevention of mother to child transmission (PMTCT) and voluntary counselling and testing (VCT).

One of the most effective interventions currently available for persons living with HIV and AIDS (PLHA), involves the use of various combinations of highly active antiretroviral therapies (HAART). However, the high cost of these drugs and the infrastructure needed to monitor their use have so far put these medications beyond the reach of most PLHA, especially in third world countries. The price of antiretroviral drugs is progressively declining, making access to HAART a realistic dream even to resource-constrained countries like Tanzania. For optimal use of these drugs, capacity building including training of health personnel, infrastructure strengthening, logistic support and central regulation and policy guidance, are extremely essential.

### **1.3 HIV Transmission**

HIV infection is acquired through sexual intercourse with an infected partner; exposure to infected blood and blood products; from an infected mother to the unborn child in the uterus, during delivery, or from breast milk. More than 90% of adults in sub-Saharan Africa acquire HIV infection from unprotected sexual intercourse with infected partners. Transmission of HIV through body fluids other than blood and genital secretions such as CSF, pleural fluid, amniotic fluids etc. is certainly possible. However, to date there are no reported cases of HIV transmission resulting from exposure to saliva, urine or sweat suggesting that the risk of an individual acquiring infection from these body fluids is minimal if any.

### **1.4 Pathophysiology of HIV infection**

Interaction between the viral envelope proteins (gp120) and receptors on the cell membrane is critical for the HIV to enter and infect the host cell. High concentrations of the CD4+ molecule and co-receptors have been detected on the surface of T-lymphocytes and macrophages. Other cells that have been found to have CD4 molecules on their surface include the Langerhans cells (found in the skin) and the microglial cells of the brain.

Following entry of the HIV into a susceptible host cell, using the enzyme reverse transcriptase, the viral genome copies itself from RNA to DNA genetic material. The viral DNA copy enters the nucleus of the host cell and becomes intimately incorporated into the host cell's own DNA using the enzyme integrase. The virus thus becomes a permanent part of an infected person's nuclear proteins. There follows a latent period during which the provirus in the infected host cell nucleus is waiting for an external stimulus to start reproducing.

CD4+ T lymphocytes when stimulated by new HIV, other infections and infestations which would normally result in the CD4+ T lymphocyte reproducing itself, now respond to these stimuli by manufacturing HIV. As more and more viruses are produced and leave the host cell, the cell membrane weakens leading eventually to the death of the infected CD4+ T lymphocytes. Other factors, most of which are still unknown, lead to the rapid depletion of the CD4+ T lymphocytes. The decline in the CD4+ T lymphocytes count is a reflection of the declining cellular immunity, which eventually manifests itself by the appearance of opportunistic infections.

### **1.5 Natural history of HIV infection**

Major advances have been made during the past few years in the understanding of the complex pathogenetic mechanisms leading to the propagation of HIV infection overtime and to the progression of HIV disease and AIDS.

Initial infection with HIV is characterized by a relatively brief period of high level acute virus replication. This is sometimes marked by the development of a flu like illness with fever, malaise, enlarged lymph nodes, sore throat, skin rash or joint pains. This acute febrile illness is accompanied by widespread dissemination of the virus to different tissues especially the lymphoid system that is extensively involved. HIV blood tests that are designed to detect presence of HIV antibodies (ELISA, Rapid immunoassays etc) are usually not yet positive at this point in time. However such patients are highly infectious although they test negative for HIV using the

common tests that depend on detection of antibodies against HIV. The high level of viraemia present at the time of sero-conversion may persist for about three months but eventually stabilizes at an individual “set point”. The number of RNA copies/unit virus (viral load) is an indicator of disease activity. Nevertheless most patients are clinically asymptomatic in spite of this ongoing extensive immunological battle.

During this asymptomatic phase of the infection, levels of CD4+ T-lymphocytes, the prime target cell for HIV gradually decline although the rate of decline varies substantially among patients. Major factors that are known to influence the rate of CD4+ T-lymphocyte decline include:

- Patient genetic factors
- Viral load (number of HIV-RNA copies/unit volume) at the “set point”
- Viral characteristics
- Age

Studies of cohorts of patients over long periods both clinically and biologically have demonstrated the value of measuring viral load (expressed as number of copies/ml) as the most powerful predictive indicator of disease progression. Viral load and number of circulating CD4+ T-lymphocytes/mm<sup>3</sup> are the two most important parameters to consider in deciding to start evaluating treatment. Viral load is the measure of disease activity and can be used to evaluate the rate of the immune system deterioration before and during treatment and the risk for development of resistance during treatment. The CD4 count can be used to evaluate the risk for complications including the development of opportunistic infections.

A high ‘set point’ has been shown to be associated with rapid disease progression than a low “set point”. Infection with syncytium forming viruses is associated with rapid rate of disease progression compared to none-syncytium forming viruses. Development of severe immuno-suppression could occur within 2-4 years but may be delayed for more than 15 years. In the “typical” HIV infected patient however it takes 8-10 years. Activation of the immune system for example by infections such as tuberculosis and worm infestation accelerates onset of immuno-suppression. Consequently, institution of preventive therapy to opportunistic infections, early detection and administration of effective and appropriate treatment of infective conditions in persons with HIV infection do minimize the risk of rapid onset of immuno-suppression. Preventive therapies currently used include those for TB, bacterial infections, *Pneumocystis carinii* pneumonia, (PCP), toxoplasmosis and cryptococcal meningitis.

Comprehensive clinical care of persons with HIV disease therefore requires the health care personnel to have appropriate clinical knowledge, experience and laboratory support to identify patients with subtle as well as those with gross features of HIV disease. Once diagnosis of HIV infection is made, the goal of any treatment aims at limiting or delaying progression and onset of AIDS for as long as possible to reduce morbidity and to increase survival.

Theoretically the multiple steps in replication of HIV provide opportunities for intervention. Therapeutic regimens may be directed at one or several of the following stages essential for viral replication: (See Chapter 12 for more details).

- Attachment of HIV to host cell
- Reverse transcription of viral RNA to DNA
- Intergration of the proviral DNA into the host cells’ DNA

- Expression of the viral gene after it has been integrated into host cell DNA including the process of transcription of more viral RNA and the translation of viral proteins
- Processing and post-translational modification of protein products of the virus
- In addition, delay of disease progression can be achieved in three ways:
  - Prolonging amount of time it takes for the virus to replicate
  - Lowering the viral load
  - Increasing CD4+ cell count

## **1.6 Progression of HIV infection**

### **1.6.1 Primary infection or becoming HIV infected**

Most people who become infected with HIV do not immediately notice that they have been infected, but some have short illness soon after they have been infected. This is called sero-conversion illness. It may last for a few weeks and is often accompanied by flu like illness with fever, malaise, enlarged lymph nodes, sore throat, skin rash and/or joint pains. This acute febrile illness is accompanied by widespread dissemination of the virus to different tissues especially the lymphoid system that is extensively involved. HIV blood tests that are designed to detect the presence of HIV antibodies such as ELISA and Rapid Immunoassays are usually not yet positive at this point in time.

### **1.6.2 Clinically asymptomatic stage**

This stage may last for an average of 8-10 years and is free of symptoms although there may be swollen glands (Persistent Generalized Lymphadenopathy- PGL). At the initial stages of HIV infection, most patients are clinically asymptomatic in spite of this ongoing extensive immunological battle that ensues once rapid viral replication begins. All HIV positive individuals can transmit the virus but the chances of transmission are higher when the viral load is higher. This is WHO stage 1.

### **1.6.3 Symptomatic HIV**

Over time the immune system loses the struggle to contain HIV and so symptoms develop. Symptomatic HIV infection is often caused by the emergence of opportunistic infections. The commonest problems include fever, respiratory infections, cough, tuberculosis, weight loss, skin diseases, viral infections, oral thrush, pain and lymphadenopathy. This stage is the WHO stages 2 and 3 depending on the particular OI seen. See Table 15 on p. 92-93 and Table 9.1 and 9.2 on p. 38-40 for reference.

### **1.6.4 AIDS**

Diagnosis of AIDS is confirmed if a person with HIV develops one or more of a specific number of severe opportunistic infections or cancers. Such conditions include Kaposi's sarcoma, Cryptococcal meningitis, PCP, Toxoplasmosis, CMV retinitis etc.

This is WHO stage 4.



## **Chapter 2**

# Organisation of HIV and AIDS Care and Treatment



## 2.1 Overview

Tanzania has a Care and Treatment Plan for People Living with HIV and AIDS (PLHA) as one of its Strategies in the Health Sector response to the HIV and AIDS epidemic. Starting and scaling up of the delivery of ART requires the development of AIDS care and treatment guidelines, to ensure that the quality of care and treatment services is standardized throughout the country. Quality, effective and efficient care and treatment can be provided if careful attention is paid to the following:

- Intensified and sustained efforts of identifying HIV infected individuals
- Developing a multi-disciplinary team approach to life long disease management including treatment
- Developing linkages between the related services within facilities and communities, to ensure a smooth flow of patients across a continuum of care including prevention through a proper referral system.

## 2.2 Serostatus Determination

Meeting the goals of the HIV and AIDS Care and Treatment Plan will require a greatly expanded effort to identify patients in need of care and treatment. All segments of the healthcare structure in Tanzania will need to have a role in this effort. Counselling and Testing capability needs to be established for different levels of the health care system including TB, MCH, OPD, and STI clinics as well as in-patient services. A key challenge of the Care and Treatment Plan will be both to increase the capacity for testing and counselling, and to sensitize the community to support those who want to know their serostatus.

## 2.3 Scope of Care and Treatment at the Care and Treatment Clinic (CTC)

People suffering from HIV related illnesses, may attend a wide variety of services at different levels of the health care system in Tanzania. These services may range between a public or private multipurpose clinic or health centre, home based care program, antenatal clinic or PMTCT program, VCT site, TB or STI clinic, a general OPD unit or an inpatient ward. In order to provide effective and quality HIV and AIDS Care and Treatment, services need to be organized in a manner to ensure regular and standardized follow up. The establishment of a Care and Treatment Clinic (CTC) at health care facilities accredited for the provision of HIV care with ART, will ensure that over time a cohort of people in need of HIV care can be registered, provided with care and treatment as well as followed up. Close collaboration needs to be ensured for essential related services such as DOTS for TB, reproductive health and family planning and home care services. There are certain core elements of care and treatment that need to be established at the care and treatment clinics. These include:

- Basic education regarding the mechanism of HIV infection and disease progression.
- Management of disease symptoms
- Education about behaviour change to reduce transmission of HIV
- Orientation to the care and treatment programme
- Education and counselling on life-long disease management
- Education and counselling about actions that may delay progression of disease and reduce co-morbidities by addressing nutrition, food safety and clean water

- Routine clinical care and nutritional assistance to malnourished patients
- Prophylaxis for OIs as indicated by these guidelines. (see chapter 10.3)
- Assessing eligibility for ART (clinically, Social and CD4+ counts)
- Recording and reporting according to the established system

Each of the patients that are seen at the CTC, will fall into one of three clinical categories with specific clinical goals of treatment as outlined below:

- (i) Clinically asymptomatic stage (mildly immuno-suppressed):** HIV positive individuals, who are symptomatic and/or CD4 cell counts are high, will come to the clinic for periodic monitoring. The goals of care for these patients are to delay progression by treating and/or preventing opportunistic infections, advice on healthy life styles and to enhance the likelihood of success of future treatment by improving adherence to prophylactic medications and visits.
  
- (ii) Symptomatic HIV (moderately immuno-suppressed):** HIV positive Individuals who have significantly compromised immune systems but are not eligible for ART. These are at greater risk for progression to AIDS and will need close monitoring. The goals of care for these patients are to delay progression by treating opportunistic infections and to enhance the likelihood of success of future treatment by improving adherence to medications and visits.
  
- (iii) AIDS (treatment-ready patients):** These are patients who are eligible for ART as detailed in the criteria in later chapters. The goals of treatment and care for these patients are to reduce morbidity and mortality by aggressively suppressing viral load and treating opportunistic infections, and to maximize the benefits of treatment by encouraging consistent adherence to antiretroviral therapy.

Patients in any of the three categories are strongly advised to come to the CTC whenever their clinical situations deteriorate.

## 2.4 Care and Treatment Organisation

### 2.4.1 Patient Visits Plan

Once a patient is identified, he or she will be referred to the CTC. At the initial clinic visit a triage nurse will assess patients needs, register basic information, issue relevant forms, weigh and direct patient to relevant sites. Blood will be drawn for a confirmatory HIV test if there is doubt on their status, and CD4 cell count, before the patient meets with a counsellor. Given that test results will typically not be available on the same day, the patient will be scheduled for a follow-up visit with a clinician to discuss the test results.

At the follow-up visit, after consultation with a clinician, patients who are recommended for and agree to initiate therapy will meet with a counsellor to discuss about adherence, medication dosing and adverse event management. They will have another blood sample drawn for tests which will help inform the treatment protocol and to identify baseline values for monitoring toxicity. Patients will be scheduled for follow-up after two weeks, then monthly for the first six months for clinical care and monitoring of response to therapy

(including toxicity management). During these visits, they will see an evaluating clinician, pick up their medication from the pharmacy, and meet with a counsellor (see counselling section below). After six months, the patient will be requested to visit the clinic once a month for medication and counselling and as needed for clinical care. At six months intervals, CD4+ counts and basic blood tests will be performed and patients will see an evaluating clinician for follow-up and to evaluate response to therapy.

For those who do not immediately qualify for treatment, regular monitoring of their status will be required as follows:

- Asymptomatic (WHO stage 1): Periodic monitoring will be required, with CD4+ cell counts, and staging visits being done every 6 months
- Symptomatic (WHO stage 2, and stage 3 who do not qualify): Regular monitoring will be necessary, with CD4 counts and staging being done every (6 months).
- All patients are however to be advised to come into the CTC immediately should their condition deteriorate prior to their next scheduled visit.

## 2.4.2 Adherence management and lifestyle counselling

Patients on ARV treatment will be strongly encouraged to identify an adherence assistant. The adherence assistant is any person identified by the patient to help him/her with ARV medications, e.g. a family member, friend, colleague, or community member. When necessary, patients with special needs can be assisted by counsellors and social workers.

During their monthly visit to the CTC, each patient will participate in a lifestyle counselling session. This time will be used to reinforce key behaviours relating to adherence strategies; disease management; transmission risk reduction; nutrition and adverse event management. Counselling will also focus on psychosocial issues such as disclosure of HIV status, assistance with social support and mental health.

## 2.4.3 Medical Records System

A Patient Identification Card, Patient Record Form and an ART Reporting Form, have been designed for the purpose of patient identification, patient monitoring and programme monitoring respectively.

**Patient Identification Card (CTC 1)** is a card with a pre-printed unique patient identification number. The Card is issued at the first visit, at the registration section of the facility. The Card is for patients on ARV treatment and HIV positive persons not yet on treatment but are being monitored by the programme. The Card will be kept by the patient and used for identification purposes at every visit.

It is important that the patient carries treatment relevant information with him/her whenever he sees a new clinician, e.g. when he transfers to another facility. The same initial identification number will be retained to avoid loss of follow up and double recording of the patient

Patient Record Form (CTC 2) is a form initiated at the first visit of any HIV positive person attending the Care and Treatment Clinic. The Card is issued by the facility registration unit of the Care and Treatment Clinic by/or on the order of the attending clinician. The form has a unique ID number, copied from the Patient

Identification Card. The Form is kept in a file and retained in the facility registry or dedicated HIV and AIDS care and treatment cabinet and is to be retrieved at each visit using patients' unique ID number. Key information on patient management is filled in by the attending clinician.

**ART Reporting Form (CTC 3)** captures information for programme monitoring. The Form is currently printed in pads containing 50 carbonated triplicate sets. Registry personnel or a counselor copies all required information from the Patient Record Form to the ART Reporting Form. First and second copies of filled forms are removed and sent to NACP and DMO respectively at the end of every month, while third copies remain at the facility. Every patient's visit (whether on ART or not) should be recorded and reported at the end of each month.

Each facility participating in the National Care and Treatment Programme, should identify a person to be responsible for ART reporting and handling of the Forms.

## **2.5 Linkages across a continuum of care**

Successful linkages with a variety of partnering programmes and care sites are encouraged at all levels. Partnerships between the CTC and support programs in the community need to be established in order to ensure a continuum of care through functional referral mechanisms.

### **2.5.1 PMTCT Programmes**

The MoH has set a goal of establishing Prevention of Mother to Child Transmission (PMTCT) programmes, in all antenatal clinics in the country by the end of 2006.

ART availability will allow for expansion of the PMTCT programme into a PMTCT-plus effort, with counselling aimed at enrolling the entire family in continuing care and treatment offered by the CTC, most closely associated with the antenatal clinic.

Availability of polymerase chain reaction (PCR) machines at reference laboratory facilities, will allow for early diagnosis of HIV infection among children born to HIV positive mothers. The goal will be to allow the start of ARV therapy in all HIV infected children within the first four months of life. In the absence of a PCR facility, WHO Clinical Staging should be utilised in initiating ARV treatment. (See Chapter 12 and Chapter 13).

Close linkage and coordination between the PMTCT Programme and the Care and Treatment Programme will make each programme more effective and efficient.

### **2.5.2 Antenatal Clinics**

Antenatal clinics will also serve as counselling and testing sites. At the very minimum, strong referral systems should be put in place to ensure that any HIV positive individuals seen at the antenatal clinic are appropriately enrolled by the CTC.

### **2.5.3 VCT Programmes**

The national target is to have six VCT centres per district, each with at least two full time counsellors by 2006. Whether free-standing or hospital based, public or NGO sponsored, VCT centres will continue to play a crucial role in identifying PLHA by confirming HIV infection, and therefore be a critical feeder of patients to the HIV and AIDS Care and Treatment Programme. Strong referral processes will need to be established between all VCT sites and the appropriate CTC to ensure that HIV positive individuals are either enrolled for treatment, or have their condition monitored as appropriate.

### **2.5.4 STI Services**

All patients identified to have STIs will be counselled for HIV testing. Facilities engaged in ART should ensure that close coordination is developed among all medical practitioners involved in STI treatment. Because STIs increase the risk of transmitting HIV, all patients in HIV care should also be screened and treated for STIs.

### **2.5.5 NTLP Clinics**

With HIV prevalence of about 50% among TB patients, NTLP clinics will serve as an important channel for identifying HIV positive individuals. The feasibility of providing HIV counselling and testing within the TB clinic should be encouraged at all NTLP clinics. Subsequently HIV positive individuals should be referred to a care and treatment clinic for further management.

### **2.5.6 Community Based Programmes**

A continuum of care for PLHA is an essential element of any care and treatment programme. Community programmes supporting PLHA need to be closely linked with CTCs at the facility level.

Home based care programs are providing comprehensive care and support within the household level and include:

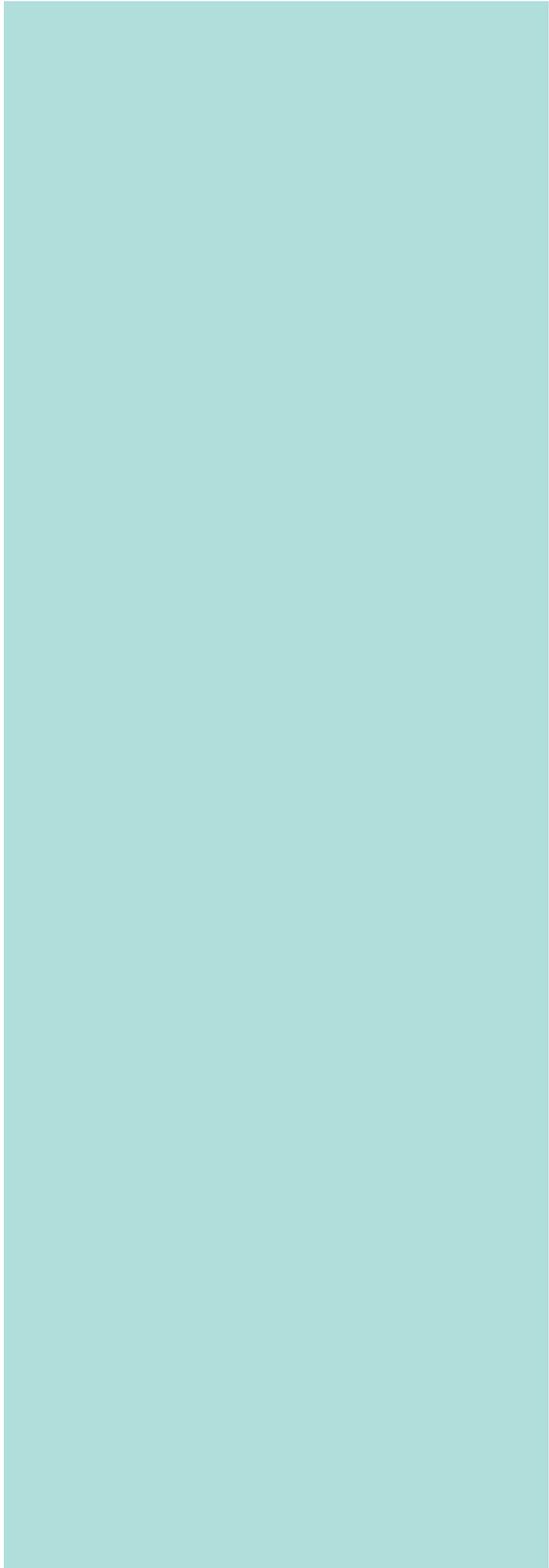
- Basic support, such as food, hygiene and shelter.
- Clinical support such as preventive therapy, simple medications and adherence to a long term treatment.
- Psychosocial support.
- Referral to access VCT, Family Planning, and Clinical facilities
- Community education in Care and ART fundamentals.
- Prevention activities
- Promotion of PLHA support groups

Each facility delivering Care and Treatment services should be encouraged to develop a plan to link with and support community organizations dealing with community based care.



## **Chapter 3**

# HIV and AIDS Prevention



### 3.1 Introduction

The provision of HIV clinical care at the various levels of the health care system in Tanzania offers a unique opportunity to deliver prevention messages and interventions. People in need of care who have established a trusted relationship with a health care provider are motivated and are likely to accept the need for behaviour change and practices necessary to stop further HIV transmission. Abstinence, faithfulness, condom use and accessing early STI services are a few examples which can be highlighted during clinical care.

### 3.2 Treatment and Prevention of Sexually Transmitted Infections (STIs)

STIs are known as being co-factors for HIV transmission. Health care workers should ensure provision of quality STI services in all health facilities through the syndromic approach. Training, commodity provision and supportive supervision should be undertaken.

### 3.3 Prevention of Mother to Child Transmission

PMTCT interventions aim at reducing the risk of HIV infected mothers from infecting their babies during pregnancy, childbirth and during breast-feeding. Quality PMTCT services should be integrated within MCH services in all health care delivery setting in the country. Community members, particularly families and men should be educated to play an active part in supporting mothers to access PMTCT services and in reducing stigma, denial and discrimination.

### 3.4 Condom Programming

Condoms, both the male and female, constitute an effective protection measure against sexual transmission of HIV. Easy access to condoms for those who need them within the health care setting should be ensured and scaled up. Education on consistent and proper condom use should be provided by all healthcare staff.

### 3.5 Workplace Policy and Programme for the Health Sector on HIV and AIDS.

The Health Sector has about 60,000 health personnel in different categories. Many of them are in direct contact with infected persons and face the risk of infection through occupational exposure. They are also at risk by virtue of being sexually active members of the population depending on their behaviour and other situations that increase vulnerability to HIV.

In addition, health workers are highly regarded members of their communities, and are frequently sought for general, non-medical advice. It is therefore important to train, sensitize, and make all health workers "HIV and AIDS-competent", as well as provide appropriate means of protection through well established workplace programmes, including Post Exposure Prophylaxis (PEP) as detailed in Chapter 14. The health facility management should make sure that protective gears and supportive policies/environment for workplace HIV interventions are available and utilised by health care workers on site

### **3.6 Prevention of HIV transmission through blood transfusion**

Transfusion of HIV contaminated blood is an almost sure way of transmitting HIV infection. An effective and well functioning National Blood Transfusion Service will ensure the regular availability of adequate amounts of safe blood in all transfusing Health facilities. The government will ensure availability of reagents and supplies for safe blood transfusion through the pull system..

### **3.7 HIV and AIDS Prevention for Sex Workers and other vulnerable groups**

Sex workers and their clients, men who have sex with men as well as intravenous drug users, have disproportionately high prevalence of HIV compared to the general population. Increasing access to services and interventions for these groups will reduce the transmission of HIV infection not only among these groups, but also in the general population. NGOs, CBOs and other agencies working with these groups need to be supported.

### **3.8 The Youth (in and out of school) HIV and AIDS**

The priority health sector interventions for youth include the expansion of youth friendly services, implementation of youth focused promotion activities and the tracking of behaviours through conducting behaviour sentinel surveillance. In addition, there is a need to design programmes with and by them, rather than just for them, thus ensuring appropriate link between intention and outcomes.

### **3.9 Voluntary Counselling and Testing (VCT)**

Voluntary Counselling and Testing has been shown to be effective in influencing change in sexual behaviour and practices. In order for VCT services to function properly they need to be linked to care and support services. They also need to be accessible and user-friendly.

### **3.10 Reduction of stigma and discrimination**

Stigma and discrimination constitute major factors in inhibiting service utilization and a proper response for the HIV and AIDS epidemic. IEC/BCC on stigma need to distinguish between felt and enacted stigma. Felt stigma is more prevalent feelings that individuals harbour about their condition and the likely reactions of others. Enacted stigma refers to actual experiences of stigmatization and discrimination, e.g. attitude of health workers, relatives and other members of the community.

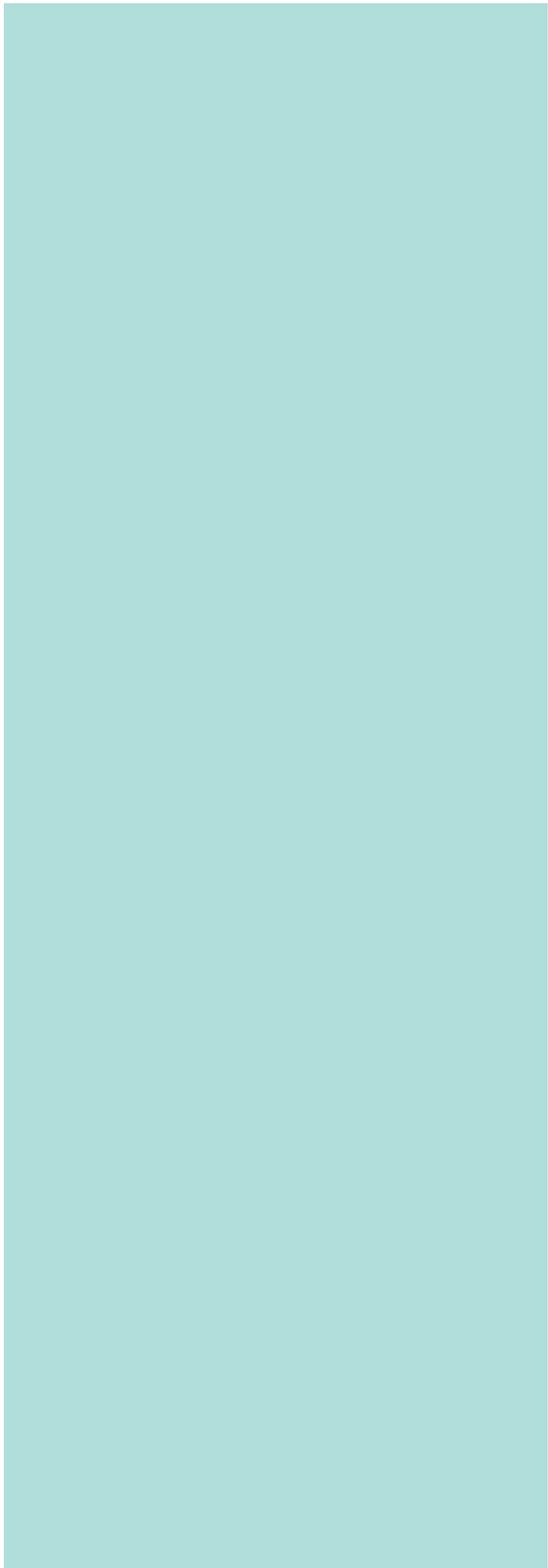
Health workers need to be targeted with measures to reduce stigma and discrimination within the health service delivery setting. In addition, being bearers of health-related information and knowledge in their communities, health workers need to be appropriately informed and sensitized on the issues surrounding HIV and AIDS so that they can transfer this knowledge and measures to reduce stigma within the general population.





## **Chapter 4**

# Protective Measures Against HIV Transmission



### 4.1 Prevention of nosocomial HIV transmission

HIV and other blood borne diseases such as Hepatitis B may be transmitted in health care settings from a patient to a health care worker, from a health care worker to a patient or from a patient to a patient. HIV is likely to be present in body fluids particularly where visible blood is present. The occupational risk of becoming HIV infected from patients in health care settings is mostly associated with needle stick injuries. Patient to patient transmission usually results from contaminated equipment, which have been incorrectly or inadequately disinfected.

Minimal infection control measures such as washing hands with soap and water, can prevent transmission during care. Nevertheless, all health care workers must adopt appropriate infection risk assessment and apply accident prevention procedures. The context and environment in which health care is provided must offer safety to the health care provider. If such measures are employed, most patient care settings should not pose any significant risk of HIV transmission.

### 4.2 Prevention of HIV transmission through Standard Precautions

Standard precautions are simple set of effective practice guidelines (creating a physical, mechanical and chemical barrier) to protect health care workers and patients from infection with a range of pathogens including blood borne pathogens. Standard precautions are used when caring for all patients regardless of diagnosis.

#### 4.2.1 Components of Standard Precautions

- The key components of standard precautions include:
- Considering every person (patient or staff) potentially infectious and susceptible to infection
- Hand hygiene including hand washing, hand antiseptics, antiseptic hand scrub and surgical hand scrub
- Personal protective equipment including gloves, masks, goggles, caps, gowns, boots and aprons
- Appropriate handling of sharps, patient resuscitation and patient care equipment, linen, patient placement and patient environmental cleaning
- Safe disposal of infectious waste materials to protect those who handle them and prevent injury or spread to the community
- Processing instruments by decontamination, cleaning and then either sterilisation or high level disinfections (HLD) using recommended procedure

#### 4.2.2 Implementation of Standard precautions

In practice, implementation of standard precautions includes the following interventions:

- Hand washing before and after any direct contact with patients
- Do not recap needles

- Safe collection and disposal of needles (hypodermic and suture) and sharps (scalpel blades, lancets, razors, scissors), with required puncture-proof and liquid-proof safety boxes in each patient care place.
- Wearing gloves for contact with body fluids, non-intact skin and mucus membranes
- Wearing a mask, eye protection and gown (sometimes a plastic apron) if blood or other body fluids might splash
- Covering all cuts and abrasions with water proof dressing
- Promptly and carefully cleaning up spills of blood and other body fluid
- Using a safe system for health care waste management and disposal

### **4.2.3 Hand washing**

Hands should be washed with soap and water:

- Before and after contact with each patient.
- Before and after each procedure.
- Before wearing and after removal of gloves
- When hands are visibly soiled.
- Before preparing, handling, serving or eating food and before feeding a patient.
- Before leaving the area of work
- Adequate supply of disposable tissues is encouraged in order to avoid reusable towels.

### **4.3 Use of protective barriers such as gloves, gowns, aprons and masks**

Gloves should be worn in all procedures involving contact with blood or other potentially infected body fluids. Gloves must be discarded after each patient, or decontaminated, washed and properly sterilized. Gloves are not required for routine care activities in which contact is limited to a patient's intact skin.

Clean non-sterile gloves will be worn:

- For examination and non surgical procedures
- Contact with blood, body fluids, secretions, excretions, mucous membranes, draining wounds, or non-intact skin.
- For handling items visibly soiled with blood, body fluids, secretions when the health worker has skin lesions on the hand.

Protective clothing such as waterproof gowns, aprons and or masks must be worn only where there is likelihood of exposure to large amounts of blood or body fluids such as in theatre, labour room or laboratory.

#### **4.3.1 Careful handling and disposal of sharp instruments**

All sharps should be handled extremely carefully to avoid prick injuries.

- Needles should not be bent, broken or removed from syringes. If they must be removed from syringes, then use forceps.
- Remove vacutainers with forceps.
- Holders must be used for all blades.

- All needles and other sharp instruments should be deposited in puncture resistant sharps containers that must be placed near the working place. The containers (safety boxes) should be clearly labelled, easily accessible and incinerated when three quarters full.

### 4.3.2 Safe disposal of waste contaminated with body fluids

Soiled waste that is contaminated with blood, body fluids, laboratory specimen or other tissues, should be placed in leak proof containers with special labels and incinerated, or buried in a 7 feet deep pit at least 30 feet away from any water source. Liquid waste such as blood or body fluids should be poured down a drain connected to an adequately treated sewer or pit latrine

### 4.3.3 Proper disinfection of instruments and other contaminated equipment

All material used repeatedly and linen must be properly disinfected and or sterilized. Thorough cleaning with soap and hot water removes a high proportion of any micro-organisms. All equipment should be dismantled before cleaning. Gloves must be worn during cleaning of equipment and if splashing with body fluids is likely, additional protective clothing such as water proof aprons, gowns, boots, protective eye glasses or masks should be worn. Method of decontamination can be decided based on the following criteria:

**Table 1: Criteria for selecting decontamination method**

Level of risk	Items	Decontamination method
High risk	Instruments which penetrate the skin/body	Sterilization and single use of disposables
Moderate risk	Instruments which come incontact with non-intact skin or mucous membrane	Sterilization, boiling or chemical disinfections
Low risk	Equipment which comes in contact with intact skin	Thorough washing with soap and water

### 4.3.4 Proper handling of soiled linen

Soiled linen should be touched as little as possible, they should be collected in bags and not rinsed or sorted out at the patient care area. If possible linen with large amounts of blood should be transported in leak proof containers, and if not available they should be folded with the soiled parts inside, and handled carefully with gloves. Soiled linen should be soaked in hot water with sodium hypochlorite solution (e.g., Jik) for not less than thirty minutes, then washed separately in hot water and then air dried.

### 4.3.5 Sterilization and disinfection

The Human Immunodeficiency Virus does not survive well outside the human body. Nevertheless, it is mandatory that health care workers and family members caring for HIV infected persons take precautions in order to prevent accidental spread of the virus.

All forms of sterilization will destroy HIV. Recommended methods of sterilization include steam under pressure e.g. autoclave or pressure cooker, or dry heat such as oven. Disinfection will usually inactivate HIV. Recommended disinfectants are Bleach 10% (corresponds to a 0.5% sodium hypochlorite solution) and 1% Lysol. Commonly methods used are boiling and chemical disinfection with hypochlorite solution. If there is a need for boiling equipment, then they must be cleaned and then boiled for at least 20 minutes.

#### **4.3.6 Cleaning floors**

Detergents and hot water are adequate for routine cleaning of floors, beds and toilets. In case of spillage of blood or body fluids, the area should be cleaned with chlorine based disinfectant and followed by thorough cleaning with soap and hot water. Pour hypochlorite 1:10 on the site, clean with paper towels. Then pour hypochlorite solution again and clean. CIDEX can also be used.

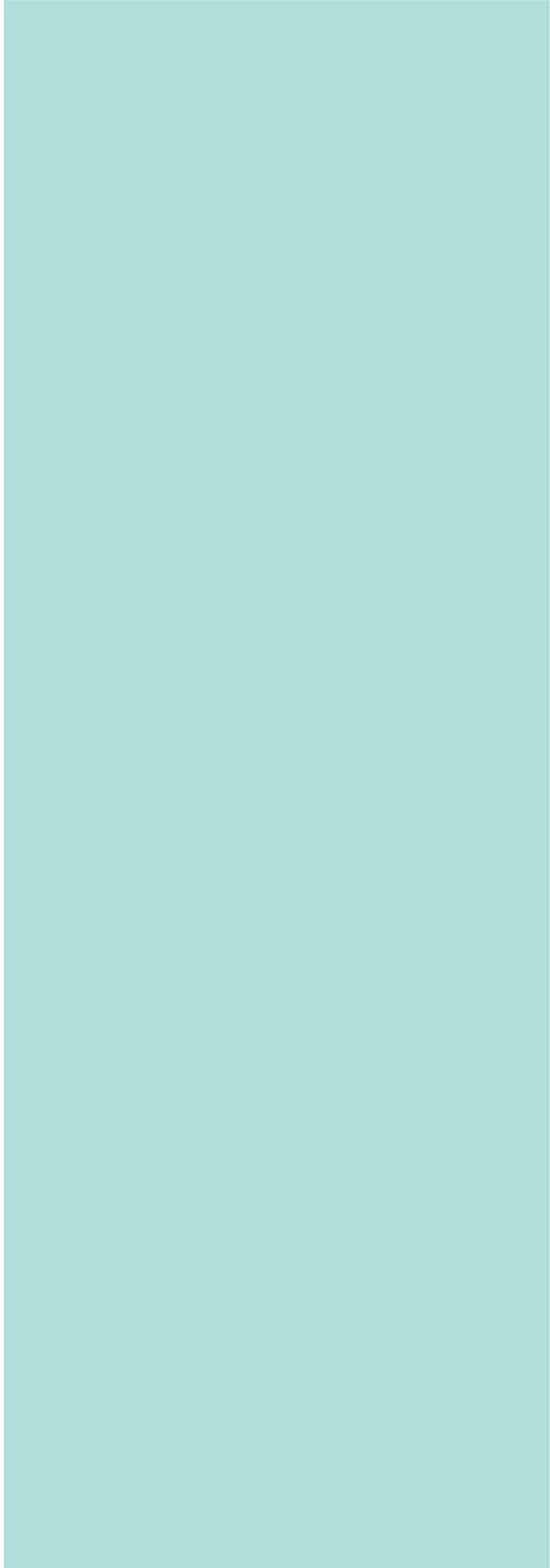
All health care workers must be made conversant with universal Precautions Post-exposure prophylaxis (See Section 14.2 for more details).





## **Chapter 5**

# Laboratory Tests in HIV and AIDS



Laboratory tests in HIV and AIDS care and management can be classified as follows:

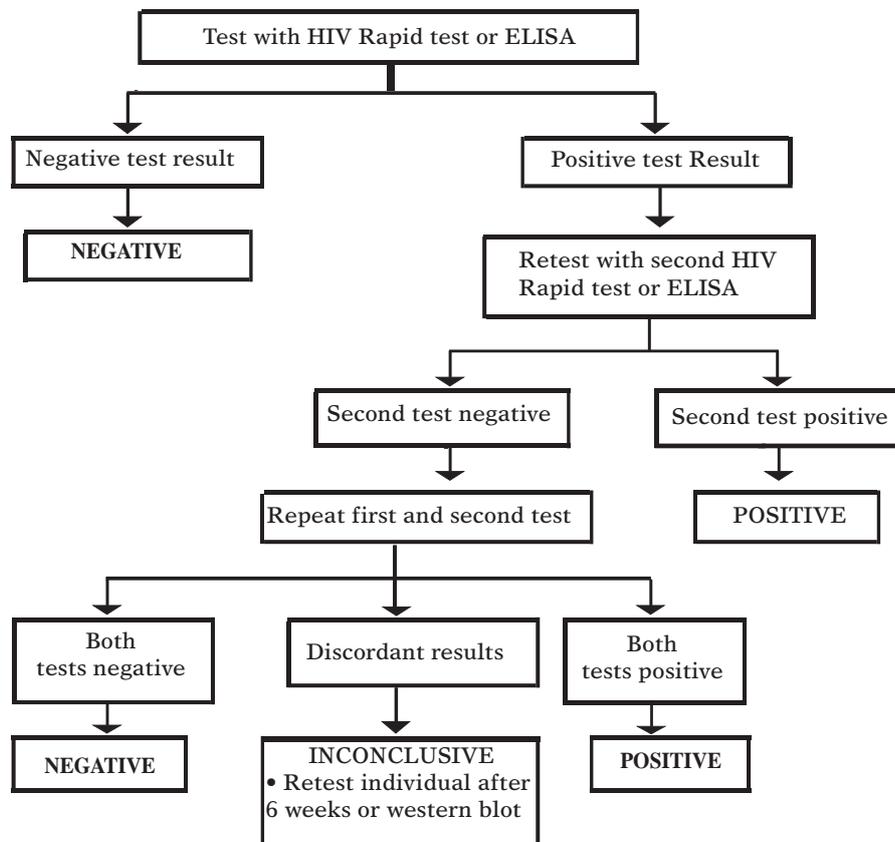
- Tests for HIV diagnosis
- Tests for treatment eligibility and efficacy monitoring
- Tests for treatment safety monitoring

## 5.1 Tests for HIV Diagnosis

### 5.1.1 HIV Diagnosis in Adults and Children over 18 months

Diagnosis of HIV infection in adults and children older than 18 months can be made serologically by detection of antibodies to HIV using rapid tests or ELISA. To confirm a diagnosis of HIV infection, two tests are used in serial testing and a second test should only be done after the first test is positive or inconclusive, as per the national algorithm (Figure 1). Only HIV rapid and ELISA test kits in the national algorithms are to be use in Tanzania.

**Figure 1: HIV Diagnosis Serological Testing Algorithm for Adults and Children over 18 months**



## Notes:

In areas where it is available, ELISA tests can be done instead of rapid tests.

Send specimen to the laboratory whenever rapid test results are discrepant.

All children, regardless of exposure to HIV infection and/or HIV status should be followed up according to the current national IMCI and/or WHO guidelines for management of children. See chapter 6.4.3, which states that children should be followed up monthly in the first year of life, and 3 monthly thereafter till the age of 5 years.

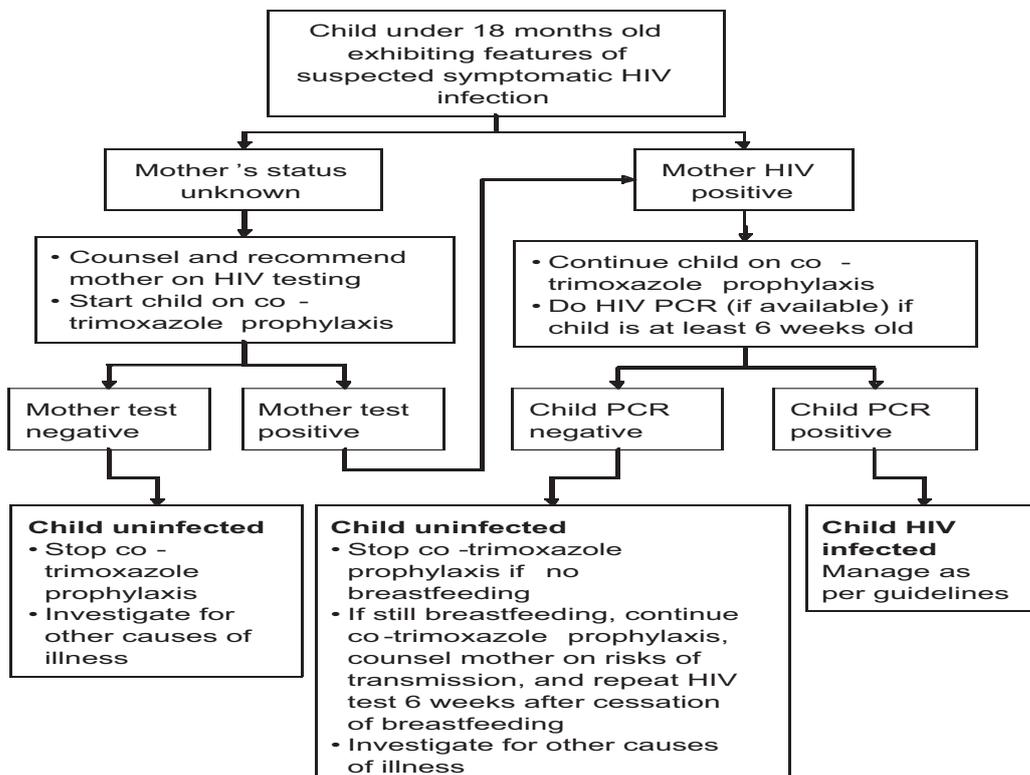
### 5.1.2 Diagnosing HIV infection in children under 18 months

At present, the majority of infants are diagnosed on the basis of symptomatic HIV disease and the positive HIV antibody test of the mother of the child. The child of an HIV infected mother can acquire HIV antibodies from his/her mother during pregnancy and via breast milk if breastfed. These may persist in his or her blood until 15-18 months of age, even if the child is not infected with HIV. Thus a child may test HIV positive by an antibody test (e.g. rapid test or ELISA) without actually being infected.

HIV antibody tests (e.g. rapid and ELISA) should not be performed on young infants given the fact that these may measure maternal antibody. Care should be taken not to mislabel a child by assigning an HIV positive status if the mother is HIV positive. The correct term to use for a child is **HIV exposed**. No child under 18 months of age should be labelled HIV-positive based on HIV rapid test or ELISA antibody detection methods.

**HIV infection can be diagnosed in most infected infants by the age 6 weeks by using the DNA PCR technique where available**

Figure 2: HIV Testing by PCR for Children under 18 months of age



**Note:** A second specimen is necessary for PCR to confirm an initial positive result.

If PCR is unavailable: continue cotrimoxazole and regular monthly clinical monitoring.

For all children determined to be HIV negative but are still being breastfed by HIV+ mothers, appropriate counselling should be given to the mother on the risks and potential for HIV transmission to the child.

### 5.1.3 HIV Diagnostic Protocol for Abandoned Infants

In case of unavailability of the mother, the guardian needs to be counselled and the child started on co-trimoxazole prophylaxis. If PCR test is available, test the child at 6 weeks and proceed according to figure 5.2.

<b>1.</b>	<b>6 weeks of age: HIV PCR</b>
<b>2.</b>	<b>3 months of age: Repeat HIV PCR to confirm 6 week result</b>

#### Notes:

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

If PCR is unavailable clinical monitoring and prophylaxis should continue until the child reaches stage III upon which ART can be started. HIV testing (ELISA or rapid) should be performed as soon as the child attains 18 months of age.

## 5.2 Tests for treatment eligibility and efficacy monitoring

**Table 2: Adult ART First Line Regimens Laboratory Monitoring**

<b>Regimen</b>	<b>Monitoring Tests</b>	<b>Frequency</b>
d4T / 3TC / EFV	CD4+ ALT	Staging, 6-monthly 3-monthly
d4T / 3TC / NVP	CD4+ ALT	Staging, 6-monthly Baseline, week 2, thereafter 3 monthly
AZT / 3TC / NVP	CD4+ FBC ALT	Staging, 6-monthly 3-monthly Baseline, week 2, thereafter 3 monthly

*Staging* = initial testing for all HIV +ve persons to determine if actual need for antiretroviral therapy (ART) and during ART to determine if need for change of ART

*Baseline* = testing at initiation of ART to monitor drug toxicity

**Table 3: Adult ART Second Line Regimen Laboratory Monitoring**

Regimen	Monitoring Tests	Frequency
AZT / ddl / lopinavir / ritonavir	CD4+ FBC Fasting cholesterol and Triglyceride Fasting glucose	Staging, 6-monthly Baseline, then 4-monthly Baseline, 6 months and thereafter every 12 months Every 12 months

**Table 4: Paediatric ART Regimens and routine monitoring**

Regimen	Test	Frequency
d4T / 3TC / ritonavir	CD4+ Fasting cholesterol Fasting glucose	Staging, 6-monthly Baseline, 6-monthly Baseline, 6-monthly
d4T / 3TC / nevirapine	CD4+ ALT	Staging, 6-monthly Baseline, week 2, 4 and 8, thereafter 6 monthly
AZT / 3TC / ritonavir	CD4+ FBC Fasting cholesterol Fasting glucose	Staging, 6-monthly Baseline, then monthly for 3 months, then 6 monthly (with CD4+) thereafter Baseline, 6 monthly Baseline, 6-monthly
AZT / 3TC / nevirapine	CD4+ FBC ALT	Staging, 6-monthly Baseline, then monthly for 3 months, then 6 monthly (with CD4+) thereafter Baseline, week 2, 4 and 8, thereafter 6 monthly
d4T / 3TC/ Lopinavir/ritonavir	CD4+ Fasting cholesterol Fasting glucose	Staging, 6-monthly Baseline, 6-monthly Baseline, 6-monthly
d4T / 3TC/ EFV	CD4+	Staging, 6-monthly
AZT / 3TC / Lopinavir/ritonavir	CD4+ FBC Fasting cholesterol Fasting glucose	Staging, 6-monthly Baseline, then monthly for 3 months, then 6 monthly (with CD4+) thereafter Baseline, 6-monthly Baseline, 6-monthly
ddl / AZT / nevirapine	CD4+ FBC ALT	Staging, 6-monthly Baseline, then monthly for 3 months, then 6 monthly (with CD4+) thereafter Baseline, week 2, 4 and 8, thereafter 6 monthly
ddl / ABC / nevirapine	CD4+ ALT	Staging, 6-monthly Baseline, week 2, 4 and 8, thereafter 6 monthly
ddl / AZT / EFV	CD4+ FBC	Staging, 6-monthly Baseline, then monthly for 3 months, then 6 monthly (with CD4+)
ddl / ABC / EFV	CD4+	Staging, 6-monthly

## 5.3 Tests for treatment safety monitoring

### 5.3.1 Grading of adverse reactions in adults and adolescents

**Table 5: Laboratory Adverse Events in Adults**

TEST		LABORATORY TEST ABNORMALITIES			
ITEM	GRADE 1 TOXICITY	GRADE 2 TOXICITY	GRADE 3 TOXICITY	GRADE 4 TOXICITY	
Haemoglobin	8.0-9.4 g/dL	7.0-7.9 g/dL	6.5-6.9 g/dL	<6.5 g/dL	
Absolute Neutrophil Count	1-1.5 x 10 <sup>9</sup> /L	0.75-0.99 x 10 <sup>9</sup> /L	0.5-0.749 x 10 <sup>9</sup> /L	<0.5 x 10 <sup>9</sup> /L	
ALT	1.25 - 2.5 upper normal limit	>2.5 - 5 upper normal limit	>5.0 - 10 upper normal limit	>10 upper normal limit	
Triglycerides	3-4.51 mmol/L	4.52-8.48 mmol/L	8.49-13.56 mmol/L	>13.56 mmol/L	
Cholesterol	>1.0 - 1.3 upper - normal limit	>1.3 - 1.6 upper normal limit	>1.6 - 2.0 upper normal limit	>2.0 upper normal limit	

**Note:** the repeat tests may require additional patient's visits over and above the routine monitoring visits

**Table 6: Grading the severity of adverse reactions in children**

LABORATORY TEST ABNORMALITIES				
ITEM	GRADE 1 TOXICITY	GRADE 2 TOXICITY	GRADE 3 TOXICITY	GRADE 4 TOXICITY
Haemoglobin > 3 mo. – < 2 y. o.	9.0-9.9 g/dL	7.0-8.9 g/dL	<7.0 g/dL	Cardiac failure secondary to anaemia
Haemoglobin 2 y.o.	10-10.9 g/dL	7.0-9.9 g/dL	<7.0 g/dL	Cardiac failure secondary to anaemia
Absolute Neutrophil Count	0.75-1.2 x 10 <sup>9</sup> /L	0.4-0.749 x 10 <sup>9</sup> /L	0.25-0.399 x 10 <sup>9</sup> /L	<0.25 x 10 <sup>9</sup> /L
ALT (SGPT)	1.1 - 4.9 µg/l upper normal limit	5.0 - 9.9 µg/l upper normal limit	10.0 - 15.0µ/l upper normal limit	>15 µg/l upper normal limit
Triglycerides	-	1.54-8.46 mmol/L	8.47-13.55 mmol/L	>13.56 mmol//L
Cholesterol	-	4.43-12.92 mmol/L	12.93-19.4 mmol/L	>19.4 mmol/L

## 5.4 Laboratory Safety Procedures

Safety precautions are essential and should be followed at all steps starting from specimen collection to storage, transporting and disposal of biohazard wastes so as to minimize occupational risks. The risk of transmission of HIV, hepatitis B virus (HBV) and other Transfusion Transmissible Infections (TTIs) can be minimized if laboratory workers use the safety precautions /procedures at all times.

- Always open body fluid sample containers with care, preferably under a safety cabinet or while wearing a face mask.
- Used disposable syringes and needles, scalpel blades and other sharp items must be kept in puncture-resistant containers for disposal.
- Protective barriers (for example rubber gloves) must be used to prevent exposure to blood, body fluids containing visible blood, and other fluids to which universal precautions (described in chapter two) must be applied.
- Hands and other skin surfaces that are contaminated with blood, body fluids containing visible blood or other fluids must be washed thoroughly immediately.
- All specimens should be treated as infectious.
- When in laboratory, wear and fasten laboratory coats and closed shoes.
- Cover cuts and abrasions with water proof adhesive elastoplasts and avoid handling infectious samples.
- Wipe up any spills with paper towels soaked with appropriate disinfectant (e.g. 0.5% sodium hypochlorite) immediately. All laboratories handling infectious materials should always have a biohazard spill kit containing paper towels, gloves, tweezers, disinfectant and heavy duty biohazard disposal bags).
- All contaminated waste should be decontaminated before disposal, this includes body fluids. Methods of decontamination include autoclaving, chemical (e.g. sodium hypochlorite 0.5%). Broken glassware and containers of contaminated utensils and needles must be directly incinerated.

- Materials that are to be decontaminated or disposed of outside the laboratory should be placed in a strong, leak proof container prior to transporting them outside the laboratory.
- In case of needle stick injury, squeeze the wound immediately; wash with plenty of water and soap and report to the supervisor immediately for possible post exposure prophylaxis (PEP).
- Care must be taken to prevent injuries when:
  - Using needles, scalpels and other sharp instruments or devices
  - Handling sharp instrument after procedure
  - Cleaning used instruments
  - Disposing used needles
- Supervisors should have and maintain a log book to record laboratory accidents
- (N.B: For more details please refer to Chapter 4)

## 5.5 Phlebotomy Safety Procedures

Gloves should always be worn during phlebotomy to reduce the incidence of blood contamination of hands. However, gloves cannot prevent penetrating injuries caused by needles or other sharp instruments. Therefore gloves should always be available to laboratory health care workers conducting phlebotomy. A fresh pair of gloves should be used for each patient.

Gloves are particularly important in the following situations:

- For performing phlebotomy when the worker has cuts, scratches or other breaks in the skin (after covering the cuts with elastoplasts).
- Where the worker judges that hand contamination with blood may occur e.g. on an uncooperative patient
- When performing finger or heel prick on infants and children
- Use disposable, single-use blood collection safety sets (safety needles, vacuum tubes and holders) wherever possible. Where syringes and needles have to be used, never use the two-handed method to re-cap the needle after collection. Remove the needles from the syringe before dispensing blood into tubes.

## 5.6 Sample Storage Procedures

- Always store samples in tightly closed and labelled tubes kept upright in racks.
- Always keep a record of stored samples.
- Always dispose used or old specimens timely by autoclaving and incineration
- Storage should be according to the temperature required

## 5.7 Sample Transportation Procedure

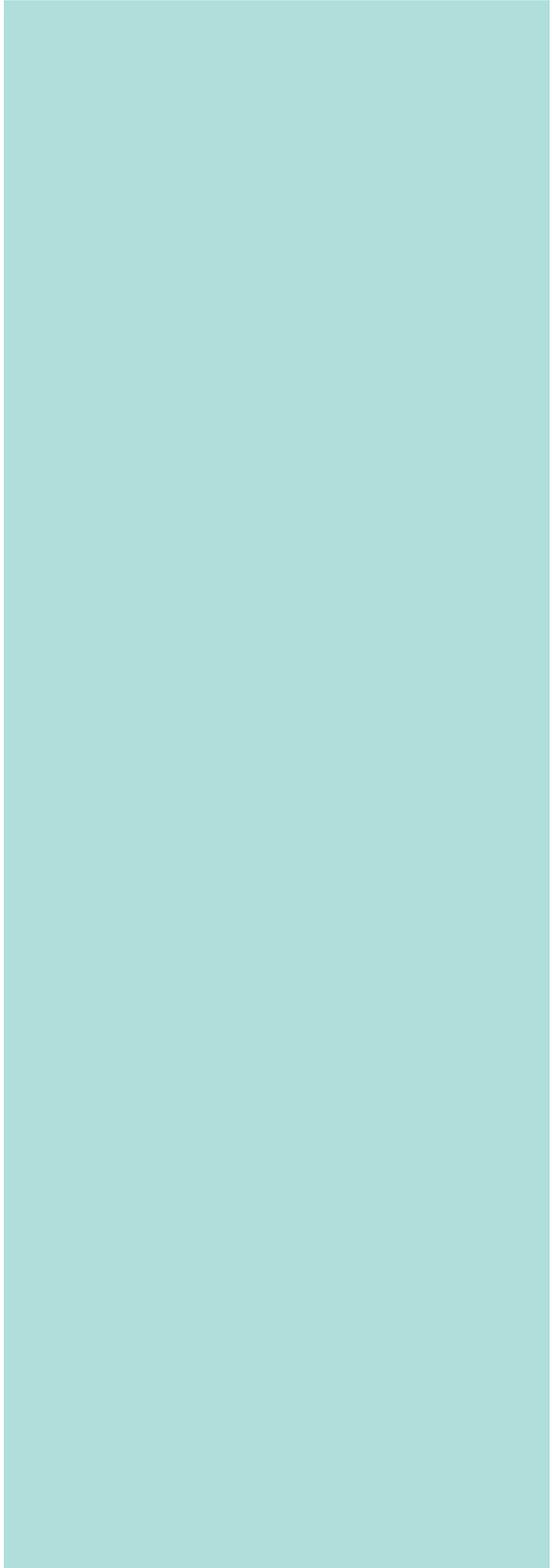
If blood is to be transported from the clinic to laboratory or from one laboratory to another, it is recommended that:

- Specimens should be stored appropriately according to Standard Operating Procedures (SOPs) before shipping.
- Dispatch and receipt records should be maintained
- Specimens should be shipped in safe containers as per shipping (SOPs)



## **Chapter 6**

# HIV and AIDS in Pregnancy



## 6.1 Introduction

HIV infection is now a common medical complication for pregnancies in Tanzania. This has major implications in the management of pregnancy and childbirth. HIV infection in pregnancy like in non-pregnancy is acquired through the same modes as elaborated in Chapter 1. However, HIV in pregnancy is special in that it can be transmitted from mother to child.

The HIV prevalence among pregnant women in Tanzania varies from 4 – 32%. However, the majority do not know their sero-status, although some of them learn about it after they are tested in ANC. It should be noted that HIV infection leads to adverse pregnancy outcomes such as pre-maturity, low birth weight, congenital malformations and stillbirths. However, pregnancy does not adversely affect the course of HIV and AIDS except in advanced stages of the infection.

## 6.2 Mother to Child Transmission of HIV (MTCT)

The risk of MTCT is estimated at 15 – 40% in developing world. Transmission of HIV from mother to child is the cause of over 90% of all HIV infection in children aged below 15 years. It is estimated that MTCT is the cause of about 72,000 infected children in Tanzania annually (using year 2000 data).

Available data in Tanzania shows that the risk of transmission is about 40%, generally distributed as follows:

- 10% in utero
- 20% during labour and delivery
- 10% through breast-feeding

**Table 7: Estimated Risk and Timing of Mother-To-Child Transmission (MTCT) in the absence of interventions**

Timing	Transmission rate
During pregnancy	5 - 10%
During labour and delivery	10 - 15%
During breastfeeding	5 - 20%
*Overall without breastfeeding	15 - 25%
*Overall with breastfeeding to 6 months	20 - 35%
*Overall with breastfeeding to 18 to 24 months	30 - 45%

\* Includes risk rates during pregnancy, labour and delivery

Several factors have been shown to be associated with an increased MTCT of HIV, these include:

Viral factors

- High levels of maternal viral load are associated with increased transmission.
- Transmission rates have been shown to differ in different subtypes e.g. subtype C is associated with high MTCT of HIV compared to subtype A, B and D.
- Maternal Factors.

- Primary HIV infection during pregnancy.
- Unprotected sex during pregnancy and lactation may lead to maternal re-infection.
- Poor maternal nutrition.
- Presence of abruptio-placenta or chorioamnionities.
- Maternal disease stage: advanced stage of AIDS is associated with increased risk of HIV transmission.
- Presence of other maternal infection during pregnancy and delivery e.g. STIs such as syphilis, chancroid and bacterial vaginosis.
- Obstetric Factors
  - Mode of delivery; elective caesarean section reduces transmission risks.
  - Intra-partum haemorrhage is associated with increased HIV transmission to the infant.
  - Obstetric procedures e.g. early rupture of membranes, episiotomies, vacuum delivery and forceps delivery increase the risk of MTCT of HIV.
- Foetal factors
  - Pre maturity
  - Genetic susceptibility
  - Twin pregnancy
- Postnatal Factors
  - Breast conditions (mastitis, breast abscess, nipple cracks).
  - Pattern of infant feeding (prolonged breast feeding, mixed feeding).
  - Infant infections (e.g. oral thrush, gastritis).

### **6.3 Prevention of Mother to Child Transmission of HIV (PMTCT)**

A number of strategies are used to reduce the risk of HIV infection among women of reproductive age. These include promotion of access to counselling and testing (the opt-out approach in line with PMTCT Guidelines) during encounters with pregnant women in the family planning services, antenatal clinic, antenatal ward, and other sites where they may receive medical services. Male involvement should be promoted.

It is also prudent that general information, education and communication (IEC/BCC) and other prevention interventions are employed to reduce HIV transmission in the general population.

Prevention of Mother to Child Transmission (MTCT) can be achieved through:

- Prevention of pregnancies through family planning services.
- Provision of prophylactic ARV to HIV infected pregnant women. See current MTCT guidelines for the appropriate regimen.
- Provision of comprehensive antenatal care
- Provision of appropriate obstetric care
- Modification of infant feeding practices
- The exclusive use of replacement feeding
- Exclusive breast-feeding with safe and rapid transition to replacement feeding.

### **6.4 Antenatal care of women with HIV and AIDS**

HIV positive women should receive similar obstetric antenatal care to that given to HIV negative women, unless indicated by need to provide specific HIV specific treatments. There is no evidence that for a need

to increase the number of antenatal visits, provided there are no complications of the HIV infection, although additional counselling time may be required. The care of HIV positive woman during pregnancy should include ongoing counselling and support as an integral part of management.

In some cases, the symptoms of HIV related diseases may first be detected while a woman is attending antenatal care. In such cases the woman should receive counselling about HIV and AIDS, and its implication for her health and that of her child. The integration of antenatal care, medical care for HIV related conditions, social and psychological support is important.

- The topics for such counselling and support should include the following:
- Correct explanation of when test result would be expected
- Potential modes of transmission, particularly delivery methods and infant feeding.
- Encouragement to involve her partner or reliable close friend
- How to access a support network and continued counselling as necessary
- Early reporting of illnesses, HIV related or not e.g. weight loss, diarrhoea
- Self-care initiative e.g appropriate nutrition
- Current information on the impact of HIV on the mother's and baby's health

#### **6.4.1 Care during labour and delivery**

Care during labour for HIV positive women follows routine practice unless otherwise indicated. Repeated vaginal examinations without clear indications should however be avoided. Prolonged rupture of membranes should also be avoided as mother to child transmission of HIV risk is increased where membranes are ruptured for more than four hours.

Artificial rupture of membranes should not be applied if progress of labour is adequate. Standard precautions should always be applied in managing women in labour. Episiotomy should not be performed routinely, but reserved for those cases with an obstetric indication. Suction of the newborn should only be done when absolutely necessary.

#### **6.4.2 Postnatal care of a woman with HIV and AIDS**

Stress and adjustment of the postnatal period is likely to be intensified for the woman who is HIV positive, complicated by anxiety about her baby's health and her own, uncertain about the future and long term well-being and care of her baby.

Elements to be addressed in postnatal care include the following:

- Continued care at the MCH clinic for post-partum follow up and close coordination with the CTC staff to address HIV related emotional and clinical issues.
- The health worker should be alert of the woman's sense of isolation, loneliness and guilt and should support or make a referral to a counsellor, social worker or contact with self help group as appropriate.
- Postnatal examination should specifically be directed towards eliciting signs or symptoms suggestive of physical illness and emotional stress

- Gloves should be worn when examining the perineum, caesarean wound, carrying out cord care, changing the babies diaper, or when carrying out invasive procedures such as collection of blood sample.
- The mother should be encouraged to take care of her baby if the condition allows
- Plan for follow up care of mother and baby should be discussed prior to discharge, and the woman should be encouraged to consider the role that might be played by the community health workers for her ongoing care.
- Decision to inform other care givers of her HIV status should be left to the woman herself and arrangements for information should be discussed with the woman
- Information on contraception should be offered before discharge. Some women will not have confided their HIV status to their partners, and this discussion might offer an opportunity to explore this difficult problem. Further formal counselling may assist a woman to find a way of discussing her infection with her partner
- Information on any special requirements on child care including early signs of infections in infants
- Women need to be fully educated about the symptoms of HIV infection, and encouraged to report to the clinic if she develops fever or any other symptoms /signs
- The health worker should encourage the woman to talk about her feeding options and discuss the additional risk of breastfeeding. The decision not to breastfeed may be an additional source of disappointment, which she may want to talk about, along with it being a marker of her infection. For more information on infant feeding counselling, refer to infant feeding counselling section of the MTCT Guidelines, March, 2004.
- Access to family planning should be promoted at every clinic visit
- Health care workers have an essential contribution to make in coordinating appropriate care and providing accessible source of information and support after delivery. The health worker should plan with the woman for early and regular follow up of at the nearest Care and Treatment Clinic (CTC)

### **6.4.3 Follow up for the HIV Exposed Child**

- Babies born in health care facilities should receive an MCH card in which NVP prophylaxis dose must be indicated if given.
- Routine follow up (monthly up to one year; then 3 monthly up to 5 years)
- Do a full clinical re-assessment at each follow up visit including growth and developmental assessment
- Counsel about feeding practices. Avoid giving both breast milk and formula milk (mixed feeding) in the first 6 months of life
- Start Cotrimoxazole prophylaxis from 6 weeks onwards. (For dosages see table 8)
- Perform an antibody test for HIV infection at 18 months, and if child is breastfeeding, at 6 weeks after stopping breastfeeding. If PCR test is available it should not be done before 6 weeks. If the initial PCR is positive, a repeat test is recommended before disclosure of results.

### **6.4.4 Use of prophylactic antiretroviral (ARV) drugs during pregnancy**

Use of antiretroviral drugs has been shown to reduce the risk of transmission from mother to child. All pregnant women who are HIV positive can be prescribed Nevirapine and advised to take it when labour

starts. Women who deliver at home should be advised to bring their babies for Nevirapine administration within 72 hours of delivery. A single dose of 200 mg orally is given to the mother at onset of labour combined with a single 2 mg/kg oral dose given to her infant within 72 hours after delivery.

If a pregnant woman is on ART (first- or second-line therapy) then the baby still needs to get the single dose of NVP and the mother needs counseling on breast feeding options (exclusive breast feeding or formula etc).

For initiating ART (first and second line regimens) in pregnant women, refer to Chapter 12.

**Table 8: Cotrimoxazole Prophylaxis for the HIV-exposed Child**

<b>Weight</b>	<b>Dosage and Formulation</b>
Below 10 kg	5 mg/kg syrup
Between 10 - 15kg	1/2 tablet single strength
Above 15kg	2 tablets single strength



## **Chapter 7**

# Pediatric HIV and AIDS Related Conditions



## 7.1 Introduction

The majority of children with HIV acquire the infection from their mothers, either during pregnancy, labour, and delivery or after birth during breastfeeding. Most infants become infected during the peripartum period or through ingestion of infected mother’s milk. Infected infants may have no symptoms or signs of infection soon after birth but usually develop features of infection in the early infancy period.

The natural history of perinatal HIV infection in infants is characterized by an early onset of symptoms, rapid disease progression, rapid CD4+ lymphocyte loss and severe clinical course in 20% of the children. The HIV viral load (VL) is relatively higher in children than adults, probably because of the consequences of viral replication in the expanding lymphoid mass in infancy and the relatively immature immune system, which may make sustainable suppression of viral replication more difficult than in adults. In that connection, the prognosis of HIV infection in children is worse than in adults. In the absence of HAART, one third of children who acquire HIV through vertical transmission die in the first year, another one third die in second and third year, and the remaining one third survive for 3 to 15 years.

## 7.2 HIV and AIDS Manifestations in Children

Children may develop persistent generalised lymphadenopathy, failure to thrive, weight loss, persistent fever, recurrent skin rashes, recurrent pneumonias, recurrent bacterial infections and septicaemia, meningitis and encephalitis, persistent diarrhoea, pulmonary lymphocytic infiltrations, chronic parotitis and less frequently malignancies, such as, Kaposi’s sarcoma and lymphomas. Children may also develop opportunistic infections, such as, Pneumocystis pneumonia, candidiasis, non-typhoid salmonellosis, cryptococcal meningitis, tuberculosis, herpes simplex virus infections, and varicella zoster infection.

Clinical signs and symptoms in children that should prompt suspicion and therefore further clinical and laboratory evaluation are elaborated in the national IMCI algorithm, and the WHO clinical stages for HIV exposed children as below;

**Table 9.1: REVISED WHO CLINICAL STAGING OF HIV AND AIDS FOR INFANTS AND CHILDREN**

For use in infants and children aged under 15 years with laboratory evidence of HIV infection: HIV antibody in those aged 18 months and above, DNA or RNA virological testing or P24 antigen testing for those aged under 18 months

Clinical Stage 1
<ul style="list-style-type: none"> <li>• Asymptomatic</li> <li>• PGL</li> </ul>
Clinical Stage 2
<ul style="list-style-type: none"> <li>• Hepatosplenomegaly</li> <li>• Papular pruritic eruptions</li> <li>• Seborrhoeic dermatitis</li> <li>• Extensive human papilloma virus infection</li> <li>• Extensive molluscum contagiosum</li> </ul>

- Fungal nail infections
- Recurrent oral ulcerations
- Lineal gingival erythema (LGE)
- Angular cheilitis
- Parotid enlargement
- Herpes zoster
- Recurrent or chronic URTIs (otitis media, otorrhoea, sinusitis)

### Clinical Stage 3

- Moderate unexplained malnutrition not adequately responding to standard therapy
- Unexplained persistent diarrhoea (14 days or more )
- Unexplained persistent fever (intermittent or constant, for longer than one month)
- Oral candidiasis (outside neonatal period )
- Oral hairy leukoplakia
- Acute necrotizing ulcerative gingivitis/periodontitis
- Pulmonary TB
- Severe recurrent presumed bacterial pneumonia

#### Conditions where confirmatory diagnostic testing is necessary

- Lymphoid interstitial pneumonitis (LIP)
- Unexplained anaemia (<8g/dl), and or neutropenia (<1000/mm<sup>3</sup>) and or thrombocytopenia (<50 000/mm<sup>3</sup>) for more than one month
- Chronic HIV-associated lung disease including bronchiectasis

### Clinical Stage 4

#### *Conditions where a presumptive diagnosis can be made on the basis of clinical signs or simple investigations*

- Unexplained severe wasting or severe malnutrition not adequately responding to standard therapy
- Pneumocystis pneumonia
- Recurrent severe presumed 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)
- Extrapulmonary TB
- Kaposi's sarcoma
- Oesophageal candidiasis
- CNS toxoplasmosis (outside the neonatal period)
- HIV encephalopathy

#### Conditions where confirmatory diagnostic testing is necessary

- CMV infection (CMV retinitis or infection of organs other than liver, spleen or lymph nodes; onset at the age one month or more)
- Extrapulmonary cryptococcosis including meningitis
- Any disseminated endemic mycosis (e.g. extrapulmonary histoplasmosis, coccidiomycosis, penicilliosis)
- Cryptosporidiosis
- Isosporiasis
- Disseminated non-tuberculous mycobacteria infection
- Candida of trachea, bronchi or lungs
- Visceral herpes simplex infection
- Acquired HIV associated rectal fistula
- Cerebral or B cell non-Hodgkin lymphoma
- Progressive multifocal leukoencephalopathy (PML)
- HIV-associated cardiomyopathy or HIV-associated nephropathy

**Table 9.2: WHO PAEDIATRIC CLINICAL STAGING****Presumptive diagnosis of clinical Stage 4 HIV infection in children less than eighteen months old where virological confirmation of infection is not available**

In a HIV sero-positive infant less than 18 months symptomatic with 2 or more of following; oral thrush, +/- severe pneumonia, +/- severe wasting/malnutrition, +/- severe sepsis severe immuno-suppression should be suspected and ARV treatment is indicated. If CD4+% is available it should be used to guide decision making. Other factors that support the diagnosis of clinical stage 4 HIV infection in an HIV sero-positive infant are recent maternal death or advanced HIV disease in mother.

**7.3 Diagnosis of HIV infection in infants**

Laboratory tests providing suggestive and/or confirmatory evidence of HIV infection are of two types:

- Antibody tests include HIV ELISA and rapid test
- Virological tests include HIV DNA PCR assays, RNA assays, and viral culture

The child of an HIV infected mother acquires HIV antibodies from her during pregnancy and these may persist in the blood until 15-18 months of age. A child may thus test HIV positive using antibody tests (ELISA and Rapid tests) without actually being infected. Such a child is termed as HIV exposed. A test must be repeated after 18 months of age to confirm diagnosis.

HIV PCR tests are the preferred virologic method for diagnosing HIV infection during infancy.

Where available, if the child is not breastfeeding, PCR test should be performed at the second MCH visit (eight weeks post delivery). If the child is being breastfed a negative virologic test does not exclude infection because the risk of HIV transmission continues throughout the duration of breastfeeding. In such an infant, once breastfeeding has ceased for at least 6 weeks and if the child is over 18 months of age an HIV antibody test can be used to make a diagnosis of infection.

The basic effect of HIV on the immune system is CD4+ cell depletion and dysfunction. In children the CD4+ percent is the preferred immunologic marker for monitoring disease progression. The immunologic classification for HIV-infected infants and children is shown in table 10

When a child is diagnosed as HIV Positive or with clinical symptoms, it is strongly recommended to counsel parents/guardians to test other siblings and the parents themselves.

**Table 10: Immune Categories by CD4+ Count and CD4+%**

	<b>Age</b>	<b>Age</b>	<b>Age</b>
<b>Immunologic Category</b>	< 1 Year	1 – 5 Years	6 – 12 Years
Category I	> 1500 cells	> 1000 cells	>500 cells
No evidence of suppression	> 25%	> 25%	> 25%
Category II	750 – 1499	500 – 999	200 – 499
Moderate suppression	15 – 24%	15 – 24%	15 – 24%
Category III	< 750 cells	< 500 cells	< 200 cells
Severe suppression	< 15%	<15%	<15%

## 7.4 Management of infants born to HIV positive women

Counselling of parents on the care of infants born to HIV positive mothers is an essential component of the management of HIV infected children. Management strategies include:

- HIV diagnostic testing for both the mother and child
- Scheduled clinic visits for care
- Chemoprophylaxis with Trimethoprim/Sulfamethoxazole, (Cotrimoxazole is TMP-SMX) even if HIV status is unconfirmed
- Mothers should be counselled on the disadvantages and advantages of breastfeeding, paying particular attention to the risk of breastfeeding for short or long duration, and mixed feeding and advantages of exclusive breast-feeding. (Please refer to the 'Infant Feeding Guidelines in HIV/AIDS' provided by the Ministry of health). Care of the mother after delivery and during follow up including treatment of opportunistic infections should also be emphasized. Mothers should receive psychosocial support through counselling in the postnatal period.
- Infants of HIV infected mothers should receive prophylactic treatment against PCP and other opportunistic infections using cotrimoxazole (CPT) from 6 weeks of age. This should be given orally as per dosing table 8 until the HIV status of the infant is known may need to continue after breastfeeding with on-going exposure to HIV.

The antiretroviral therapy of HIV infected children is detailed in Chapter 13. HIV status of the infant is known, may need to continue.

## 7.5 Care of HIV infected Children

Children should be assessed for symptoms related to HIV and the need for treatment and prophylaxis for opportunistic infections and other HIV related conditions. Baseline laboratory tests should be performed to establish viral and immunological status whenever possible. A complete medical and immunization history should be obtained, with particular emphasis on the suspected mode of HIV transmission, history of ARV exposure (pre-, intra-, and post-partum, and during breastfeeding) timing of HIV diagnosis and family members who are aware of the diagnosis.

Children with HIV should receive routine paediatric care and should be monitored for their HIV disease status. Children under the age of 1 year should be seen monthly; thereafter, they should be seen every three months. At each visit a complete physical examination should be done paying particular attention to signs commonly associated with HIV infection (e.g., adenopathy, hepatomegaly, splenomegaly). Growth and development should be evaluated and charted at all stages of development through adolescence. The need for medication should be reviewed based on history, physical exam and laboratory findings. Doses of prophylactic or treatment medications should be adjusted for growth, and compliance and tolerability be assessed at every visit. Medication plans (OI prophylaxis and ARV therapy) need to be discussed intensively with parents or guardians. It is advisable that one single person in the household is identified as the consistent careprovider responsible for dispensing treatment to the child. HIV related care needs of parents or guardians themselves need to be discussed and referred appropriately.

Disclosure of HIV status to the child should be discussed with the parents or guardians. The process of disclosure can be done over time. Whenever the counsellor feels that the child starts asking questions about the disease and indicate to feel isolated or special due to the disease, close coordination with guardian/parent is crucial. Overall, one can start mentioning to a 4 – 6 years old child that they have a chronic

disease which requires regular clinic visits and even medicines every day. At about 8 – 10 years it is recommended to start raising the issue of HIV and AIDS in a caring and supportive environment. Before the early teen years they should know they have HIV and AIDS, how it is spread and how to stay healthy. It has been shown that when properly counselled, children can cope adequately with this. It is particularly important that adolescents be informed of their status and so can become active participants in their own care.

Children exposed to ARV should be closely monitored at every visit for signs of toxicity (i.e., clinical or laboratory indications). Adverse events should be properly documented and reported to the Ministry of Health.

## **7.6 Clinical manifestations of paediatric HIV infection**

### **7.6.1 Respiratory conditions in children with HIV infection**

Lower respiratory tract infections (pneumonias) occur commonly in children with HIV infection and are the commonest cause of death in immuno-suppressed children. Lower respiratory tract infections may be:

#### **7.6.1.1 Bacterial pneumonias**

Caused by *Streptococcus pneumoniae*, *Haemophilus influenzae*, *Staphylococcus aureus*, and gram negative bacteria such as *Klebsiella pneumoniae*

#### **Clinical Presentation**

Children present with history of fever, cough and fast breathing (tachypnoea) with or without signs of severe pneumonia (chest in drawing, cyanosis & lethargy). On auscultation of the chest one hears unilateral or bilateral crepitations (crackles), decreased breath sounds or bronchial breathing (lobar pneumonia). When pulse oximetry is available it will demonstrate hypoxia (Oxygen saturation less than 95%)

#### **Diagnosis**

- Where complete blood counts can be done a raised WBC with a neutrophilia suggests a bacterial pneumonia. In malaria endemic areas remember to do a malarial smear and treat for malaria if indicated. Where blood cultures can be done they may assist in identifying the causative agent
- CXR is not necessary but may be useful in ruling out complications or other pulmonary conditions
- If the patient is not improving after 1<sup>st</sup> line antibiotics sputum induction and nasopharyngeal aspirate may assist in the diagnosis of PCP or TB

#### **Management**

Outpatient:

- Oral amoxicillin, or penicillin is adequate
- Where the child is already on Cotrimoxazole prophylaxis CTX should not be used to treat pneumonia unless PCP is suspected. If PCP is suspected then high dose CTX should be used
- If the child is under one year of age the risk of PCP is very high and should be considered
- Give paracetamol for fever

## Management of Severe Pneumonia:

- Severe pneumonia should be managed in hospital
- Supportive Care – a Pulse oximeter is critical for assessment of Oxygen saturation and need for supplemental oxygen where the child presents with chest in drawing, cyanosis, hypoxia
- Ensure adequate hydration and monitor- intravenously or orally depending on the severity
- Remember to give paracetamol for fever and pain

## Specific therapy:

- Use Chloramphenicol or Ceftriaxone/Cefotaxime ( 3<sup>rd</sup> generation) if available
- Alternatives include of Ampicillin/Cloxacillin and Gentamicin
- Remember antibiotic therapy for HIV infected children needs to be longer 7-14 days
- Hospital management of Pneumonia
- If the child is under one year PCP must be considered as a possible diagnosis and treatment with high dose cotrimoxazole and steroids prescribed
- If an infant presents with severe pneumonia they should be treated for both bacterial pneumonia and PCP and investigated for possible HIV
- Children treated for PCP should continue on cotrimoxazole (CPT) prophylaxis until the diagnosis of HIV exposure or infection has been excluded
- If Staph pneumonia suspected add Cloxacillin or Vancomycin, as indicated by skin lesions, CXR showing pneumatoceles, positive blood culture, poor response to 1<sup>st</sup> line drugs, post measles

### 7.6.1.2 Lymphocytic Interstitial Pneumonitis

Clinical symptoms include cough, difficulty in breathing and terminally hypoxia, Associated parotitis, generalised Lymphadenopathy, and hepatosplenomegaly. Poor response to TB therapy.

Radiological picture reveals Diffuse bilateral reticulonodular infiltrates may appear similar to miliary TB; May develop consolidation, cystic lesions; bilateral hilar or mediastinal lymph node enlargement; Particularly difficult to differentiate from TB

## Management

- Steroids are needed when children with LIP have significant respiratory distress
- Prednisone 2 mg/kg/day - initially for 4 weeks daily and then an alternate day maintenance for 2-3 months and review.
- Oxygen therapy during episodes of hypoxia
- Bronchodilators like salbutamol where wheezing is a problem
- Antibiotics are needed during episodes of concurrent superinfection with pneumonia
- Chest physiotherapy and postural drainage if there is secondary bronchiectasis
- Supportive care includes correction of anemia especially iron supplementation
- Antiretroviral therapy is the specific therapy
- Refer for specialist care if resistant to therapy.

### 7.6.1.3. Pneumocystis carinii Pneumonia (PCP)

#### Clinical features

- Usually under 1 year of age
- No fever or low grade
- Marked resp distress (chest indrawing, cyanosis)
- Auscultation: clear chest or diffuse fine crepitations
- Poor response to standard antibiotic treatment
- Pulse oximetry: severe persistent hypoxia ( $\text{paO}_2 < 90\%$ )
- They may have other stigmata of HIV: splenomegaly, oral thrush, lymphadenopathy, weight loss

#### Investigations:

- Even where investigations are not available and there is a high index of suspicion therapy should be initiated promptly along with treatment for bacterial pneumonia
- CXR – hyperinflation, diffuse infiltrates or normal Sputum induction with nasopharyngeal aspirate
- Sputum stained with Giemsa or Silver stain
- Bronchoalveolar lavage where available can also be used to produce a specimen for staining

#### Management of PCP

Supportive:

- Oxygen therapy
- Maintain and monitor hydration
- Paracetamol for pain
- Continue therapy for bacterial pneumonia

Specific:

- High dose Cotrimoxazole (CTX) I.V 20mg/kg TMP /day given every 6 hours for 21 days
- Oral CTX may also be used if IV not available
- Prednisone at 2mg/kg/day for 7-14 day ( taper if > 7dys)
- Remember to provide secondary prophylaxis using cotrimoxazole after an acute episode of PCP

### 7.6.1.4. TB in children

#### Diagnosis

- Diagnosis of TB in children is difficult because of the non-specific clinical presentation and lack of sputum especially in the younger age group
- HIV infected children are often exposed to adult with HIV and TB. A high index of suspicion must be maintained especially since many other chronic lung diseases may mask TB.
- HIV infected children have lower sensitivity and specificity on diagnostic tests used for TB when compared to uninfected children
- Extrapulmonary TB more common and must be considered in HIV infected children

#### Clinical Diagnosis

- History of contact with an adult Tb in the family
- History of fever and cough >1 month
- Failure to thrive, weight loss or wasting

- Associated extrapulmonary Tb: glands, meninges, abdomen
- ESR is often elevated but it is not specific as HIV itself can cause an elevated ESR
- Mantoux Test using PPD may be useful when positive (>5mm)
- Prior BCG immunisation should not prevent the use of the TB skin test for assisting in the diagnosis of TB in children
- CXR is sensitive but not specific
- Multiple clinical scoring systems for childhood TB have been developed and can be used for the HIV infected child, but none of them are very sensitive. The WHO Scoring systems is shown as an example

## WHO TB Clinical Scoring System

Impact of HIV infection on the Value of features commonly used by Clinical Scoring Systems (Graham et al)

<i>Diagnostic Feature of PTB</i>	<i>Impact of HIV</i>
Chronic symptoms > 1month	Less specific
Smear positive contact	Less specific
Malnutrition	Less specific
Positive Mantoux	Less sensitive
Characteristic CXR	Less specific
Response to treatment	Less sensitive

## TB diagnosis (Others)

Chest X-ray findings are similar regardless of the HIV status of the child. The main findings include bilateral infiltrates with hilar adenopathy and or mediastinal widening. Others CXR findings include lobar opacity, pleural effusion, miliary TB and cavities which are rare in younger children.

Gastric aspirates X3 and/or induced Sputum for ZN stain should be done whenever possible.

Sensitivity may be increased to 40% when fluorescent stain (stain) and mycobacterial culture are done

## Diagnosis

- When appropriate, biopsy or fine needle lymph node aspirate may be diagnostic
- Body fluids - ascitic, pleural or cerebrospinal - can also be sent for ZN stain and culture but the yield is poor. Bone marrow aspirate and culture may be diagnostic in disseminated TB with persistent fever and wasting.
- Ultrasound can help differentiate loculated fluid and consolidation and a CT scan may assist in the diagnosis of abdominal, pulmonary and CNS disease

## Treatment of TB in children

In treating children that are co-infected with HIV and TB, national guidelines should be used.

The dosing schedule is as shown below:

Rifampicin	–	10-15 mg/kg
Isoniazid	–	5-10 mg/kg
Pyrazinamide	–	25-30 mg/kg
Ethambutol	–	12-18 mg/kg
Streptomycin	–	12-18 mg/kg.

### Adjuncts to Therapy:

- Multivitamins: if malnourished give pyridoxine (B6)
- High protein diet
- Steroids (eg. Prednisolone 4mg/kg daily for six weeks) are recommended in Tuberculous Meningitis, endobronchial TB, miliary TB, massive pleural effusion and TB pericarditis

It is also important to be aware of the important drug/drug interactions such as that of Antiretrovirals – (NNRTIs & PI's) with Rifampicin as well as drug toxicities. Most anti TB drugs are hepatotoxic as is NVP; INH, d4T, ddI may cause peripheral neuropathy ; Pyrazinamide may cause increased uric acid and painful joints; Ethambutol may cause optic neuritis leading to colour blindness; Streptomycin may cause renal toxicity

### TB prophylaxis – Indications

Isoniazid (INH) for 9 –12 months – 5mg/kg/day once daily

This should be according to national guidelines, remembering that HIV infected children are vulnerable to develop progressive primary disease.

Higher risk

- HIV infected child exposed to a Sputum positive adult in the household
- Infant born to mother with TB
- Other conditions which may affect the lungs in HIV infected children are cardiac conditions (e.g. cardiac failure due to cardiomyopathy,) as well as neoplastic conditions (e.g. non-Hodgkins lymphoma and Kaposi sarcoma).

### 7.6.2 Oro-pharyngeal candidiasis in children with HIV infection

Oral thrush is commonly seen in neonates especially pre-terms whose immune system is immature. In addition the condition occurs commonly in infants. However, with HIV infection and immunosuppression, the condition is persistent or recurrent and may lead to growth failure as a result of poor feeding. Oral thrush may extend into the oesophagus leading to pain on swallowing.

- Oral candidiasis should be treated with Nystatin oral suspension, 100,000 units 6 hourly for 2 weeks
- Give Ketoconazole, 3-6mg/kg/day for 7 days if there is oesophageal candidiasis. Alternatively, intravenous Amphotericin B 0.5mg/kg/day for 10-14 days can be given if ketoconazole is contraindicated or ineffective such as in active liver disease, risk of disseminated candidiasis, lack of response to oral therapy and inability to tolerate oral medication

### 7.6.3 Neurologic problems in children with HIV infection

A careful history and physical examination is of particular importance as the management of acute episodes

differs from that of progressive and static encephalopathy. The acute episode may be indicative of meningitis or encephalitis. A condition with gradual onset with slow progression may suggest a degenerative disorder. Appropriate investigations will need to be carried out to establish the diagnosis. Neurologic abnormalities in HIV infected children may include:

**Acute episodes:** Sudden development of fits, neck stiffness or irritation may occur and this may indicate opportunistic infection. Physical deficits such as hemiplegia, monoplegia or paraplegia may occur as a result of opportunistic infection of the brain and/or spinal cord.

**Progressive encephalopathy:** This is a slow but progressive reduction in motor and intellectual function beginning in the first year of life. There may be a delay or regression of developmental milestones, hypotonia, or microcephaly. Often children with neurologic problems may simply lose interest in their surroundings and have no interest in playing. Some children may lose learned language or social skills while others may show increased clumsiness. There may be a progressive decline in intellectual and behavioural function.

**Static encephalopathy:** A non-progressive mental impairment may occur. Neurologic deficits such as loss of milestones simply persist and the child is considered to be simply “slow” in everything. Managing encephalopathy should include evaluating the child with the help of a neurologist, where possible. If nothing other than HIV is found, the treatment goal is to reduce viral load. Depending on the severity, the patient will need a support system, which includes physical therapy, a social worker, and surgery to minimize contractures

**Peripheral neuropathy:** Several types of peripheral neuropathy affecting single or multiple nerves have been documented (e.g. axonal neuropathy, demyelinated neuropathy, polyradiculopathy and radiculopathy). HIV related neuropathy occurs in as many as one third of patients with CD4% <15; it presents with dysaesthesias and numbness in a “glove and stocking distribution”.

Neuropathy in children is more difficult to diagnose and less well described than in adults. In fact some ARV's can cause neuropathy (eg stavudine, didanosine, and zalcitabine) which may necessitate changing the drug regimen

Pain associated with neuropathy may respond to analgesics combined with antidepressants (eg amitriptyline) or anticonvulsants (eg carbamazepine)

## Seizures

Seizures are common non specific manifestations of neurological illnesses associated with HIV. Seizures may be due to:

- Space-occupying lesions (most often cerebral toxoplasmosis or tuberculoma)
- Meningitis
- Metabolic disturbances
- No identified cause other than HIV infection
- Treatment is aimed at underlying disorder and seizure control through standard anti-epileptic medication.

**NB:** Drug interactions may be a problem for patients on HAART; for those on HAART the drug of choice is sodium valproate

- In patients presenting with focal seizures, treatment for toxoplasmosis should be considered if no other cause is apparent.

#### **7.6.4 Persistent generalised lymphadenopathy (PGL) in children**

PGL is a common clinical manifestation of HIV infection in infants and children. The distribution of enlarged lymph nodes in children is similar to that found in adults. The investigation and management of children presenting with generalised lymphadenopathy is the same as that for adults. In children lymphadenopathy is defined as lymph node swelling in two or more anatomical sites (neck, armpit or groin). The major difference is that children commonly develop PGL as a result of bacterial skin infections and systemic viral infections commonly encountered in childhood. Hence conditions that cause generalised dermatitis, e.g., eczema, infected scabies and the viral infections such as infectious mononucleosis, cytomegalovirus infections, should always be kept in mind. Other causes of PGL in children are tuberculosis, leukaemia and lymphoma.

#### **7.6.5 Chronic parotitis**

Chronic painless swelling of the parotid glands is frequently seen in HIV infected children. The condition, known as chronic parotitis, may occur in isolation or may be associated with generalised lymphadenopathy with or without hepatosplenomegaly. In affected children the parotid glands are chronically enlarged and palpable bilaterally and resemble the swollen parotid glands seen in mumps. Occasionally HIV-infected children with chronic parotitis and generalised lymphadenopathy have lymphocytic interstitial pneumonitis as well. The cause of this condition is not known but it has been suggested that chronic parotitis in HIV-infected children may be due to Epstein Barr virus infection.

No specific treatment is available for chronic parotitis but antiretroviral therapy has been shown to be effective in treating affected children. Chronic parotitis superinfected with bacteria will present with tenderness and may be treated with antibiotics and analgesics.

#### **7.6.6 Chronic Ear Infection**

Chronic ear infection is defined as purulent discharge from the ear for 2 weeks or more. Most bacteria that cause chronic ear infection are different from those which cause acute ear infections. Antibiotics are therefore not usually effective in treating chronic ear infections. The most effective treatment is to keep the ear dry by wiping.

#### **7.6.7 Persistent or recurrent fever in children**

The management of children with HIV infection and persistent or recurrent fever is slightly different from that for the management of adults. It is essential that serious infections are excluded or treated if necessary. In an infant under 2 months of age fever is a sign of severe disease.

Children with persistent fever are usually brought in by the mother with the complaint that the child “feels hot”. A full history should be taken from the mother and any other symptoms should be elicited. The child should be examined carefully and specifically for chest signs (respiratory rate, chest in-drawing, stridor, rhonchi, crepitations and reduced air entry), enlarged lymph nodes, weight loss, bulging fontanelle, dehydration, neck stiffness, and, hepatosplenomegaly. The child may already be known to be HIV positive, or, the mother has been tested and found to be positive.

### **7.6.8 Persistent Diarrhoea**

Persistent diarrhoea is defined as diarrhoea lasting for 14 days or more. Special feeding is the most important treatment for persistent diarrhoea to prevent malnutrition. Children who are dehydrated need special attention during rehydration.

Refer to IMCI guidelines for management of persistent diarrhoea and malnutrition in children.

### **7.6.9 Impaired growth in children with HIV infection**

Children with HIV infection may be symmetrically small without meeting the criteria for failure to thrive. That is, the child may be below the 5<sup>th</sup> percentile in both height and weight and yet maintain a steady growth curve. It is important for clinicians to consider HIV infection in a child who is otherwise asymptomatic but is small for age .

Growth faltering is defined as failure to gain weight or continuous loss of weight for three consecutive months. Failure to thrive is easy to diagnose if the child's previous growth rate is known, i.e., if the child has been attending a well baby clinic on a regular basis, has been weighed and measured regularly to fill the growth chart. The cause of failure to thrive in a child with HIV infection is not clearly understood. Growth retardation in HIV infected children may be due to lack of adequate feeding or repeated chronic infections, such as, urinary tract infection, diarrhoea and pneumonia.

Children with failure to thrive may also be severely malnourished. The assessment of the severity of malnutrition may be made by examining the child's weight for age. Severe malnutrition includes kwashiorkor, marasmus and marasmic kwashiorkor. In kwashiorkor the child is oedematous and the weight falls between 60 and 80% of the normal weight for age. In marasmus there is no oedema and the weight falls below 60% of the normal weight for age. In marasmic kwashiorkor the child has oedema and the weight falls below 60% of the normal weight for age.

### **7.6.10 Principles of feeding in infants and children:**

- The basic goals for good nutrition in infants and children are to ensure satisfactory growth and development. Because of fast growth and development, the nutritional needs of children are high and in children who are HIV positive the needs are even higher because of recurrent infections.
- The mother's breast milk is still the best food for the baby. It offers the greatest protection against infections, malnutrition and premature deaths among children in resource-limited settings. In the context of HIV and AIDS babies should be exclusively breastfed with safe transition to replacement feeding as soon as it is possible. Safe transition means changing feeding rapidly from exclusive breastfeeding to exclusive replacement feeding avoiding mixed feeding. The baby is fed expressed breast milk from a cup in between the breast feeds until he is used to taking milk from the cup. Exclusive replacement feeding should be commenced only when the baby and the mother are comfortable with cup feeding.
- Mixed feeding must be avoided at all costs as it is associated with increased risk of HIV transmission to the baby through breast milk.
- Formula feeding on the other hand eliminates HIV transmission, but carries an increased risk of childhood mortality related to diarrhoea and other infectious diseases, especially in resource limited settings. Mothers who have chosen this option of feeding need considerable support to ensure adequate supply and proper preparation of baby foods.

- Qualitatively, the nutritional needs of HIV positive children are similar to the needs of HIV negative children. Most of these children should feed on three meals per day with two snack in between the meals. However, because of frequent infections these children get, they should take higher amount of energy and body building foods per meal to help maintain lean body weight. All children should receive Vitamin A supplementation where possible.

### **7.6.11 Supportive therapy**

HIV infected children should be treated like all other children, i.e., they should receive education together with other children of their own age groups, there should be no restrictions placed on their participation in school activities and sports, and they should receive the love and support of family members and teachers .

When ill, children should be treated for their illness and should receive nutritional support and care and counselling when required and should return fully to their school activities as soon as it is possible. Counselling and support should be provided for family members and carers who should be educated on the basic principles of safe practices and preventing infections from occurring through simple measures such as hygienic food preparation and hand washing. Ill children may require physiotherapy that should be provided by experts as well as by family members and carers.

School-age children who are unable to attend school due to illness should receive some form of education at home and should be encouraged to participate in playgroups. Play therapy and educational activities at home provide stimulation for ill children who can learn to live their lives to the fullest despite the illness. All HIV infected children should be assessed regularly and should receive antiretroviral therapy when eligible.

Family members, clinicians and supporting counsellors should have ongoing discussions on how and when to begin the process of disclosure of status to the HIV-infected child. The delicate balance between providing important information of one's condition, and the prevalent stigma and discrimination within the community should be respected while promoting advantages of disclosure

### **7.6.12 Pain control in terminally ill children**

The principles of pain control in children are similar to those in adults, and in particular important during terminal illness. Initially it is advisable to use non-opioids such as paracetamol or non-steroidal anti-inflammatory agents. However if pain control cannot be achieved with such measures it is essential that children be allowed to be pain free and opioids (e.g. oral morphine) should be used to achieve this. Steroids should also be considered when inflammation is noticed. It is important that care providers and family members work together and keep each other well informed on new developments. From experience, there is great use in preparing the child's care plan together with the family.



## **Chapter 8**

# Community and Home Based Care For People Living With HIV and AIDS (PLHA)



# COMMUNITY AND HOME BASED CARE FOR PEOPLE LIVING WITH HIV AND AIDS (PLHA)

## 8.1 Introduction

Tanzania experiences a high burden of HIV and AIDS, which is the commonest cause of adult morbidity and mortality in some districts. PLHA need intensive care at various stages of their infection and represent a significant additional burden to the grossly under funded public health service delivery system. Currently, patients suffering from HIV and AIDS related conditions occupy more than 50% of the hospital beds in urban areas. This is one of the justifications for the extension of institutional care of PLHA into their communities and homes.

Tanzania will provide comprehensive services to PLHA at three levels, namely: at facility, community and household levels. The patient receiving care must have access to all the three levels and a strong referral system is necessary to link all the levels with each other. The fulfilment of these conditions constitutes the continuum of care to PLHA. Health care workers should conduct supervisory visits to community and home care providers as part of their role and responsibility to ensure the continuum of care.

PLHA and their affected families and households have a variety of needs beyond the mere provision of clinical care. Such needs include psychological, spiritual, nutritional, educational, economic and legal care and support. The palliative care provided to PLHA in their homes and communities must therefore address these needs of not only the patients but also their carers at home and in the communities. An inventory or directory of service providing organisations in the local community needs to be established to facilitate networking.

## 8.2 Concept of continuum of care and home based care

### 8.2.1 Definitions

**Continuum of care** is defined as a care delivery approach which links health, medical and social support services within a defined geographical area to meet a wide and evolving range of needs over time comprehensively.

**Home based care** is assistance given to a sick person/ patient, within the home environment. The services involve prevention, care and support provided beyond the health institution and aims at meeting the overall needs of people suffering from prolonged/chronic illnesses and their family members, including taking life-long medications such as ART. The family, friends, volunteers and members of the community, trained and supported by skilled health care workers usually provide the palliative care. The care given may include physical, psycho-social, spiritual and material support, and should adapt to the patient's needs.

Within the continuum of care, the home care program (public health sector and/or NGO/CBO) aims to achieve the following objectives:

- To train home and community care providers and support them through at least once a month visits to ensure provision of quality clinical and nursing care to PLHA,

- To mobilize resources (human and material through organizations and individuals) and coordinate them towards providing care of PLHA and their families,
- To ensure that community organizations and families are involved before the patient is discharged for care in the community/home, and to encourage referral back to health institutions where indicated.
- To ensure the need for networking for local stakeholders.
- To provide support to affected families to ensure adherence preventive therapies, to ART and other prescribed medications.

### 8.3 Benefits of home based care

#### To PLHA:

- Permits them to receive care and treatment in a familiar, supportive environment and timely referral if necessary.
- Allows them to continue participating in family matters
- Maintains the sense of belonging in social groups
- Maximizes their emotional health
- Makes it easier for them to accept their condition
- Cost saving
- Reduces stigma and discrimination
- Enhances adherence to ART
- If death occurs it is at home amongst loved ones

#### To the family:

- Strengthens family ties/attachment
- Helps the family to accept the patient's condition
- Provides opportunity to learn about HIV and AIDS
- Can reduce medical and other care related costs
- Makes it easier for family members who provide care to PLHA to attend to other responsibilities.
- Involvement of the family in care enables the grieving process to be easier

#### To the community:

- Promotes awareness about prevention of the infection, care, treatment and support of HIV and AIDS
- Helps the community understand the disease and to correct myths and misconceptions about HIV and AIDS prevention and treatment
- Encourages sustainability of care services
- Makes easier for the community to provide support

### 8.4 Components of home based care

Home based care is a mechanism of care provision which includes the following components:

#### Physical care:

Care providers should always ensure that a patient receives adequate attention on the following:

- Treatment of opportunistic infections and appropriate nursing care at all times
- ART- monitoring for early side effects and continuous adherence
- Pain relief with appropriate medication (.e.g., use of NSAID's , codeine and other opioids such as liquid morphine)
- Proper drug storage.

**Nutritional care and support:** patients should be educated on appropriate nutrition using locally available food, and guided on feeding patterns and preparation of the food to suit the condition of the patient (e.g., feeding schedules for those on ART depending on their medication)

**Hygiene:** the patient and family members should be educated on the practice of appropriate hygiene e.g. oral, skin, hair and environmental care

**Exercises:** patients need to exercise regularly and if they are too weak the family members should assist the patient in doing passive exercises for body movement and to enhance blood circulation thus reducing the risks of complications such as bed sores and pulmonary problems.

**Family planning access:**

**Emotional support:** patients suffering from any chronic or terminal illness usually have a lot of fear and worries. Care givers should therefore provide emotional support and help them to ventilate and deal with the conditions. Drug adherence issues when travels are planned, business trips to be made or transfers planned.

**Social support:** patients suffering from chronic or terminal illness usually suffer from loneliness and neglect. Care givers should interact with the patient and to include him/her in decisions regarding his/her care. The patient should also be involved in recreational activities as appropriate and support or self help groups in the community should be identified for the patient to interact with.

**Spiritual support:** Addressing spiritual needs is an important aspect in any type of care. Chronically ill patients often lose hope and reason to continue to live which is often relieved through reassurance and spiritual care. Spiritual needs of the patient must be determined and attended to appropriately thus the need to involve faith-based organizations.

**Legal support:** patients should be informed about how and where to get legal aid that they need especially in areas such as inheritance, writing of wills and human rights issues. Join PLHA support groups.

**Economic support:** When a person is diagnosed with HIV and AIDS, the financial burden to the family increases given the additional medical expenses. If the bread earner is the affected party, this further constrains the limited family resources available. It is therefore necessary for home based care givers to be aware of economic support networks and opportunities where such issues can be addressed.

**Prevention in home based care (HBC):** focus on patients clinically ill, patients on ART, household members and community

## 8.5 Palliative Care

Palliative care is a set of supportive interventions that improves the quality of life of patients and their families who face the problem associated with chronic disease or life-threatening illness. This can be done through the prevention and relief of the broad spectrum of suffering be it physical, psychological or spiritual. In particular, it aims at:

- Providing relief from pain and other distressing symptoms.

- Integrating psychological and spiritual aspects of patient care.
- Enhancing quality of life, and may also positively influence the course of the illness.
- Offering support system to help patients live as actively as possible.
- Offering a support system to help the family cope during the patient's illness.
- Using a team approach to address the needs of patients and their families, including bereavement counselling, if indicated.
- Affirming life and regards dying as a normal process.
- Neither hastening nor postponing death.

Palliative care can be provided as in patients care hospital, at clinics or health centres or within a Home Care program. Palliative care is an integral part of active total care for PLHA as HIV should become a chronic manageable disease.

Many aspects of palliative care, such as, pain management, symptom control and psychological support, are applicable early in the course of the illness and therefore the palliative care needs of persons with AIDS vary from person to person and from illness to illness.

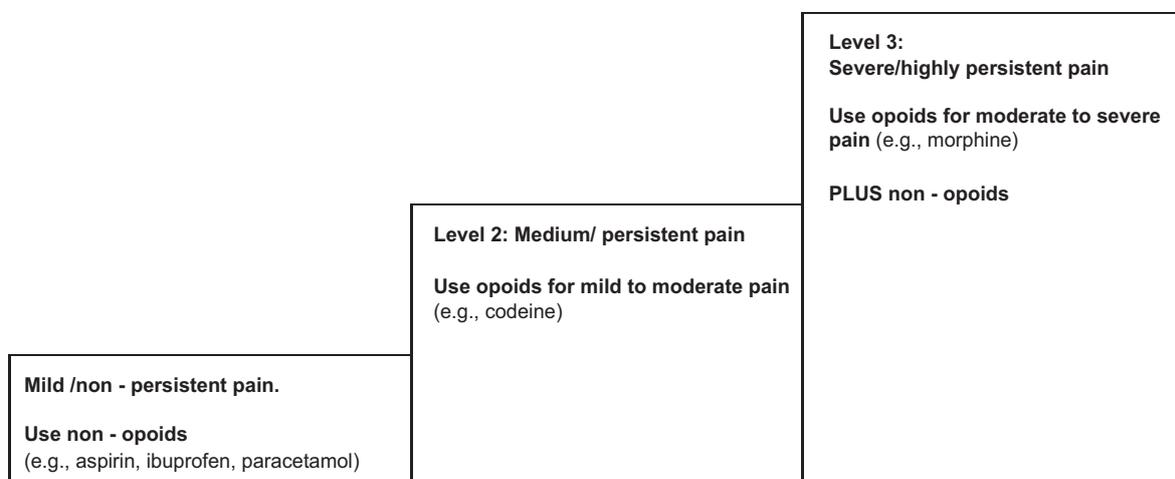
### 8.5.1 Symptom management

#### Pain

Determine the site of the pain and grade the severity of the pain. Pain control in adults should be achieved as follows:

- Initially use non-opioids such as aspirin 600mg every 4 hours, increasing to 1000mg every 6 hours, or paracetamol 500mg every 4 to 6 hours, or ibuprofen 400mg every 6 hours.
- The next level of treatment for pain control is with a mild opioid such as codeine given in a dose of 30mg every 4 hours. If this still does not control pain then a strong opioid such as morphine may be used initially in a dose of 5mg every 4 hours. This dose should be increased to levels that control pain.
- Chronic pain should be treated by month and on a regular basis. It is advisable to start with mild analgesia and progress in a step-wise to more potent analgesics and opioids if necessary. The pain control “ladder” is shown in Figure 3.

**Figure 3: Achieving pain control in persons with chronic pain**



**Medication options: Move up the ladder\* as pain persists or progresses**

\* Size of bar indicates pain level and/or its persistence

## **Breathlessness**

Patients with AIDS often develop severe breathlessness terminally. This may be the result of a severe non-responding lung infection or cancer such as Kaposi's sarcoma or lymphoma affecting the lungs and pleura. In such patients alleviate dyspnoea by propping up the patient and then refer for further management.

## **Vomiting**

Vomiting may lead to poor fluid intake and hence dehydration and therefore it is necessary to correct dehydration. Patient should be encouraged to take small amounts of fluids frequently. Vomiting may be relieved by administering prochlorperazine 5mg orally three times a day or metoclopramide 10mg orally three times a day.

## **Oral care**

Good oral care should always be practiced. This includes regularly brushing the teeth with a soft toothbrush and gargling with mouth wash solutions or weak salt solutions after food. In persons with mouth sores oral care helps. If the sores are painful patients will not be able to eat or swallow and should be given soft foods and liquid diets. If a specific cause for the ulcers is found these should be treated as described.

## **Itching**

To relieve itching, bath oils or other emollients such as emulsifying ointment may be useful. If a rash is present then antifungal creams will help if the rash is due to a fungal infection or topical steroids will relieve inflamed areas of the skin if a bacterial or viral infection is not present. Orally administered antihistamines, such as, diphenhydramine or hydroxyzine 25mg given at night may reduce the pruritus and allow a relatively more comfortable sleep.

## **Comfort**

Prevent the development of bedsores by changing the position of the patient every 4 hours and arrange for the patient to lie on an extra soft material. Avoid pressure on any one part of the body for prolonged periods of time. Protect areas that have become inflamed because of pressure by avoiding any pressure at all on the area and by applying soothing lotions. Change soiled bed sheets immediately. Massage pressure points such as the heels, elbows, ankles, back and hips frequently. Cover all open sores with a gauze bandage after applying an antiseptic cream.

### **8.5.2 Terminal care**

The main aim of those providing terminal care should be to improve the quality of life by removing or alleviating unpleasant symptoms and helping to prevent the patient from suffering, fear or loneliness. This quality care must be provided wherever the patient is, be it at home or in the hospital. Today, because of the home based care approach for HIV and AIDS, many patients are dying at home. This being part of the continuum of care, health care providers are expected to extend their services by training and supporting family members to ensure that terminally ill patients at home are well cared for.

All persons with terminal illnesses need end of life care. Towards the end of life it is essential that the patient and the family have social, emotional and spiritual support. In palliation in terminal illness one attempts to allow the patient to die with dignity and relieve him/her of distressing symptoms. Palliation also offers

support to help the patient live as actively as possible until death and enables the family to cope with their loved-one's illness and with their own bereavement. The carer needs to listen with empathy and should encourage communication within the family. Issues such as family and child support, schooling and welfare should be discussed. The patient should be told that he/she is loved and will be missed by family members. Spiritual support and discussion with the religious leader may relieve feelings of guilt. The carer should be available and should visit regularly. Bereavement counselling should be made available to family members including the children.

## **8.6 Care of body**

Care after death is one of the most important aspects of HIV and AIDS care. Standard precautions stipulate that all people, no matter what they have died from, should be treated the same. These precautions should be applied also to people who have died of HIV and AIDS. People preparing the bodies should be instructed to wear gloves, and follow the hand washing procedure. Bleach powder should be used if the body is seeping out fluids; the bleach will kill the virus. However, it is not necessary to cover the body with plastic unless there is need. Disposal and care of linen, instruments, and other materials should follow the same procedure of disinfection, sterilization and disposal as discussed in Chapter 4.0





## **Chapter 9**

# Counselling Related to HIV - Testing and Treatment Adherence



### 9.1 Introduction

In settings where HIV testing is done and results are to be shared between the client and service provider, counselling before and after blood testing is mandatory. This means no individual/client should be tested for HIV without an informed consent under such circumstances. In case of minors or comatose patients, informed consent should be obtained from a guardian or close relative. Counselling is primarily directed at addressing the psychological and social needs of the client; however, an individual may choose to involve other people in the counselling process, such as family members, close friends, sexual partners and religious leaders. Type and intensity of counselling can be expected to change during the course of HIV infection as the individual's needs evolve.

The extent to which counselling can be provided will depend on the availability of staff and other people able and willing to engage in it. In principle, counselling can be done by a range of health professionals but other professionals and lay people can and should be encouraged to provide counselling services provided they have the required skills. However, counselling should be provided by trained counsellors and where there are no trained counsellors steps should be taken to set up training activities. It is important to note that effective counselling requires familiarity with and sensitivity to the social and cultural background of the client.

Counselling should be seen as a entry point for a life-long relationship between the client and the service provider where the two should interact in case of any eventualities. The client should be encouraged to see such engagement as strengthening the partnership. Counselling is not necessarily hospital or clinic based; domiciliary visits and provision of counselling through self-help groups, clubs or other settings should be encouraged.

### 9.2 Providing HIV related counselling

The main objective of HIV related counselling is to assist the client to cope with HIV test results. Other reasons include prevention and minimize the risk of exposure or reinfection by HIV and to provide psychological support to the client and those affected by HIV and AIDS. The essential features of counselling include creating the environment for acceptance by the client, providing time to absorb news about the diagnosis of HIV, and allowing the client to react and express concerns. It is important to agree on a follow up plan with the client

The counsellor should realize that some clients seeking counselling services may be quite knowledgeable about HIV and AIDS, and that some of them may come to the counsellor for clarification of some aspects rather than needing basic information on HIV and AIDS. Some individuals may also be aware that they are at risk; others may be unaware of the risk involved. Others may come for support because they have been found to be HIV infected and some may already have developed HIV related symptoms and/or AIDS. In some cases depending on the characteristics of the clients, group counselling may be conducted.

There is therefore need for a counsellor to be flexible in their style and communication strategy so as to pass on the relevant information to each individual they see.

### 9.3 The counsellor's role

The counsellor has a number of functions to perform, including:

- Determining what the client already knows about HIV and AIDS.
- Developing an individualized risk assessment and risk reduction plan by taking proper history on the individual's behaviour, and work with them to understand associated risks.
- Facilitating the counselling process so that clients define how their life styles are linked to risk behaviours, and the potentials for changing. The counsellor should also work with the individual or group to work out a plan towards the intended modified behaviour. This process requires support of partner, family, colleagues and community and the counsellor must explore ways of involving them without putting the client at risk of stigma and discrimination.
- Determining the feelings and concerns of the client. Those who know that they are infected may fear discrimination and isolation, loss of job or housing, interruption of education and financial problems. They may have concerns about their future and that of their families, physical course of the disease and hospitalisation. They may even have feelings of loss and bereavement.
- Identifying the person's strengths and resources and capitalize on them in encouraging them to continue to live productive lives as much as they are able to.
- Referring the person for services that the counsellor or the health facility is unable to provide, such as financial, legal, education and other material support.
- Promoting disclosure to identify a treatment assistant, prepare clients for ART and assist in treatment adherence (see chapter 12)
- Promoting the formation of client support groups

### 9.4 Pre-test counselling

Counselling before testing should be provided to individuals who are considering to have an HIV test. The counselling should be done with information on basic technical aspects of screening and the possible personal, medical, social, psychological, and legal implications of being diagnosed either positive or negative. A decision to test should be an informed decision, and the testing should be organized in such a way that it minimizes the possibility of discrimination after disclosure..The counsellor should do the following:

- Determine the individual's background information on HIV and AIDS.
- Provide information on HIV and AIDS in a manner easy to understand by using simple, common and accepted language.
- Take appropriate history to assess the likelihood that the person has been exposed to HIV risk behaviours such as risk sexual relations, injecting drug abuser, having received blood transfusion, or having been exposed to non-sterile invasive procedures.
- Inquire from the client about a person who would be able to provide emotional and social support.

### 9.5 Post-test counselling

Counselling will depend on the outcome of the test. If the results are negative the following issues must be covered:

*“Window period”*: Following a possible exposure to HIV, there is a window period during which the negative test result based on antibody testing cannot be regarded definitive. The client could be infected with HIV, but still test antibody negative. The client should be strongly advised to repeat the test three months later to confirm the results, but ensure safer sexual practices during that period. For further information please see the *“National Guideline for Voluntary Testing and Counselling”*.

Further exposure to HIV infection can be prevented only by avoiding high risk behaviour. Issues on safer sex practices and healthy life styles must be covered

If the results are positive, it should be acknowledged that, receiving positive results is emotionally devastating and requires intense emotional support. This is because positive results are associated with fear, sense of loss, grief, guilt, depression, denial, anxiety, anger, suicidal thinking and loss of self esteem, etc.

As part of counselling the client should be introduced and encouraged to join the post test clubs and other self-help groups. The counsellor must be aware and have a list of groups and organizations working on HIV/AIDS care and support. Depending on client’s needs, he/she will discuss with the client regarding possible referral for required service. Issues to be discussed in post test counselling will depend on the reaction of the individual and his/her prevailing condition e.g., has developed AIDS related symptoms, is pregnant, is breastfeeding e.t.c.

The focus of post test counselling should be three fold:

- Helping the person to live positively with HIV.
- Assisting him/her to access available HIV and AIDS care and support services including treatment.
- Reducing/mitigating behaviours that put others at risk e.g., unprotected sex, continued breastfeeding, mixed feeding of infants.

Sometimes HIV test result may neither be negative nor positive (indeterminate). In such circumstances, the client should be informed about the meaning of such result and be informed that another blood specimen should be sent for ELISA testing for confirmation

## **9.6 Adherence Counselling**

### **9.6.1 Adherence Management and Lifestyle Counselling**

For details on this please refer to Chapter 2. (Section 2.4.2)

### **9.6.2 Counselling for treatment adherence**

When it is decided that the patient receives antiretroviral therapy, it is important that the patient be educated and counselled regarding ART. This is an important component of patient management as it has been shown that ART is effective if strict compliance is adhered to. The patient should receive counselling on the following issues:

- Treatment compliance should be strict and adherence to recommended treatment regimens should be greater than 95%.
- Treatment has to be maintained for life.

- In case of 2<sup>nd</sup> line regimens, there may be a need to take some drugs with food, others on an empty stomach and that some drugs require an increased intake of water.
- The need to identify financial and social support structures including family members, employers, home care programs and medical insurance companies.
- Need to attend regularly for monitoring.
- The meaning/implications of CD4+ lymphocyte counts and viral load levels need to be understood.
- Drug side effects
- Need to continue monitoring and curbing risk behaviour.
- Need to promote disclosure in order to identify adherence assistance.
- In case of adherence of children to ART, the need to identify a specific guardian or household member to administer ARV taking
- Family planning and child bearing issues such as interactions between ART and oral contraceptives and the need to employ alternate and complementary methods of contraception.

## 9.7 Adherence Monitoring - Role of the Care and Treatment Team

Evidence indicates that adherence diminishes as time progresses. Thus, monitoring and support of adherence is essential. A trusting relationship between the patient and members of the health care team is important. Optimal adherence requires full participation by the health-care team, with every patient's interaction representing an opportunity for reinforcement. Sticking to appointment dates needs particular emphasis as this practice is not common everywhere. Supportive and non-judgmental attitudes by care providers will foster patient adherence practices. Clinicians should show commitment in dealing with their patients during clinic visits, ongoing adherence monitoring, and timely response to adverse events or interim illness. Interim management during clinician's absences must be clarified with the patient. Adherence support must be intensified when problems arise (e.g. investigate new barriers, more frequent visits, involve home care programs, enlist support of family/friends, review teaching, increase home visits, etc.). For all health care team members, specific training regarding ART and adherence should be offered and updated periodically.

Ideal adherence means a patient must take more than 95% of their doses (i.e. missing less than 3 doses in a month). If a patient is taking less than 95% of their doses, they are at risk for developing viral resistance and ultimately treatment failure. Patients taking less than 85% of their doses are unlikely to have any durable viral suppression and should be targeted urgently for adherence improvement, and 6 month follow-up, while adhering to the following strategies:

- Spend time and have multiple encounters to explain goals of therapy and need for adherence.
- Consider monitoring of medications such as Cotrimoxazole or other surrogate prior to ART initiation.
- Negotiate a treatment plan that the patient can understand and to which he/she commits.
- Encourage disclosure to identified adherence assistant(s) among family or friends who can support the treatment plan.
- Inform patient beforehand of potential side effects – severity, duration, and coping mechanisms.
- Establish 'readiness' to take medications before ART initiation.
- Provide adherence tools where available: written calendar of medications, pill boxes etc.
- Encourage use of alarms, pagers or other available mechanical aids for adherence.
- Avoid adverse drug interactions; full disclosure for over-the-counter drugs and traditional medicines.
- Anticipate, monitor and treat side effects.
- Include adherence discussions in support groups.

- Develop links with community-based and home based care organizations to support adherence.
- Encourage participation in peer support groups.

### **Basic adherence package**

At each visit for patients on treatment include:

- Pill return counts (i.e., number of doses not taken during the period) are particularly important to capture those individuals who may not have understood clearly their adherence instructions e.g., not stopping treatment even when they feel better, not taking medication in correct dosages or frequency etc<sup>1</sup>. Pill counts would therefore be an ideal activity to be carried out at each patient visit, but would clearly depend on the clinic load and capacity to undertake. At the very least, it should be done for the first 3 patient visits and then at random. The tablet count may be done before the patient sees the doctor, and the count reviewed by the doctor during the early/initial visits to evaluate adherence.
- Missed/late clinic visits should trigger concerns about adherence.
- Routine adherence discussion/education with counsellor is of value. This should be an open-ended discussion, with time for questions and repetition,
- Feedback from treatment counsellors to the rest of the team is important to get a better profile of the patient and their environment,
- Encourage participation in a support group,
- Continue monthly visit with treatment counsellors
- Develop an individual adherence plan by identifying daily activities that act as triggers/reminders to take their medication, such as fixed broadcast programs or praying hours

When the adherence assessment is less than 85% at any visit, with or without viral or clinical failure:

The treatment counsellor needs to re-educate the patient and any adherence assistant (their close friends or family) about the importance of adherence. The long-term benefits need to be re-emphasised.

- Evaluate the support structures in place. Are they appropriate? How can they be improved? What alternatives are there?
- Consider the use of pillboxes and/or daily dosing diary.
- Insist on participation in a support group.
- Consider doing a psychological profile.
- Check family situation (through social worker and treatment counsellor).
- Assess effect of alcohol intake on adherence.
- Assess use of traditional medicines and its potential effect on ART adherence.
- Increase home visits by treatment counsellors to daily or weekly at a minimum (spot pill counts to be done at home), and
- Consider directly observed therapy for an agreed period.

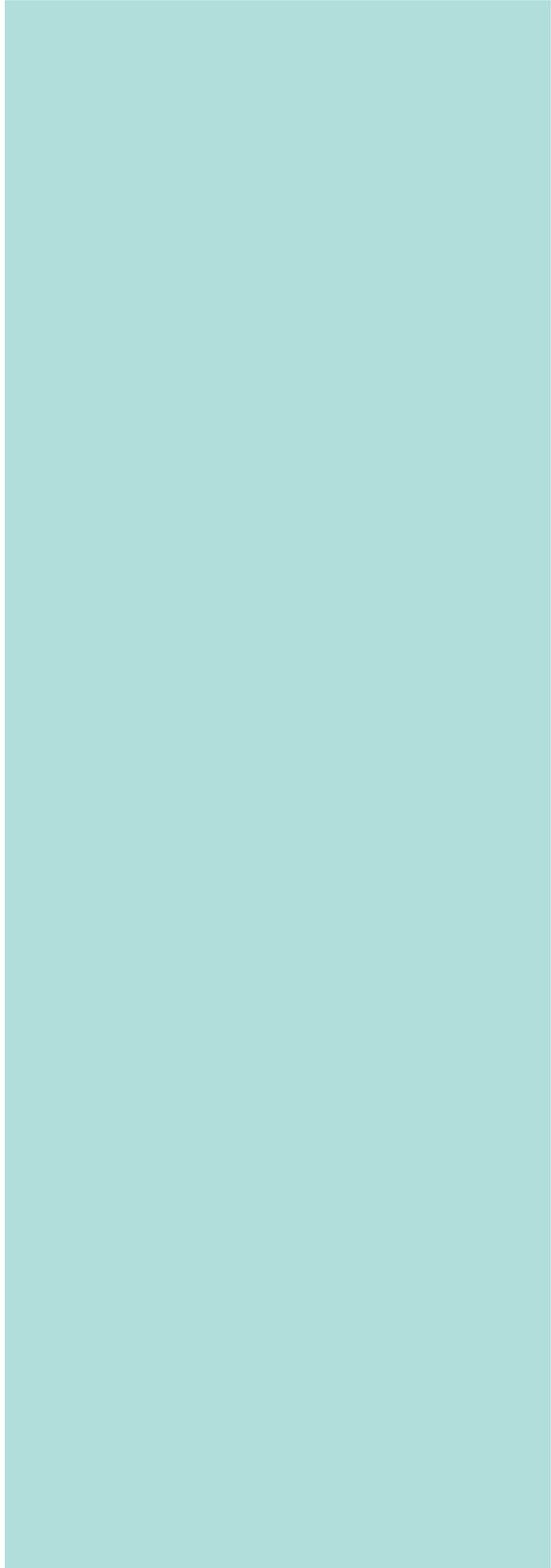
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<sup>1</sup> Pill counts are sometimes criticized because they are viewed as encouraging pill dumping from patients who have not been adherent. While this is true, it is a crucial way of discovering whether patients have understood their medication directions and the critical need for proper adherence. For those patients that throw away their pills right before their clinic visit, it is an indication that they do understand the directions and counselling given.



## **Chapter 10**

# Management of Common Symptoms and Opportunistic Infections in HIV and AIDS in Adolescents and Adults



## MANAGEMENT OF COMMON SYMPTOMS AND OPPORTUNISTIC INFECTIONS IN HIV AND AIDS (ADOLESCENTS AND ADULTS)

### 10.1 Introduction

Even though there are currently no drugs for the cure of HIV infection, there is treatment for some opportunistic infections resulting from HIV induced immune deterioration. It should always be recognized that we only treat and cure the associated diseases and symptoms and not HIV itself. In most cases patients don't die from HIV-infection, but succumb to the complications that the HIV induced immune deterioration cannot handle. With this approach the length and quality of life of the HIV infected patient can be substantially improved.

The purpose of the investigations recommended below is to identify and handle treatable causes of morbidity in HIV infected individuals. Treatment is available for most of the opportunistic infections, and all efforts should be made to deal with all treatable conditions in people with HIV and AIDS. Cancer conditions in HIV positive patients should be managed as in sero-negative individuals.

### 10.2 Clinical features commonly encountered in patients with HIV and AIDS

#### 10.2.1 Fever

Fever may be due to a variety of causes and clinical features may suggest diagnosis. If no pointing features to a diagnosis are present, as a minimum the following should be done:

- Blood slide for malaria parasites,
- Blood and urine cultures if clinically indicated.
- Chest X-ray
- Blood for widal test (Extended widal)
- Urinalysis
- Haemogram (FBP, Hb, ESR)
- Whenever possible blood culture for TB and other organisms

#### 10.2.2 Cough and dyspnoea

Persistent cough and or dyspnoea can usually be attributed to one of the following:

- Bacterial pneumonia
- Viral pneumonia
- Pulmonary TB
- Cardiac failure
- Allergic bronchitis
- Chronic bronchitis
- Bronchial asthma

It may not be possible to determine the underlying cause of cough and dyspnoea on clinical history and physical examination alone and hence laboratory tests may be of critical value.

Investigations:

- Sputum for AFB x 3 (can be done at all levels)
- Sputum for pyogenic culture and sensitivity
- Chest x-ray
- Bronchoscopy studies (consultant hospitals)
- ECG (where available)

### 10.2.3 Oropharyngeal and oesophageal Candidiasis

Patients with oropharyngeal and oesophageal candidiasis may complain of pain and/or difficulty in swallowing which may be due to infection of the esophagus with *Candida*. Examination shows white “curd like” lesions in the oral cavity. Where available, a barium swallow X-ray can be performed. For treatment any of the following may be used:

- Fluconazole orally
- Miconazole,
- Nystatin oral suspension,
- 2% sodium benzoate or Gentian violet solution,
- Ketoconazole

### 10.2.4 Vaginal candidiasis

This is one of common illnesses presenting with itchy curd-like discharge. It can be managed with:

- Clotrimazole pessaries
- Miconazole pessaries
- Fluconazole taken orally (in case of pessaries failure)

### 10.2.5 Weight loss

Weight loss in persons with HIV disease including AIDS may be due to:

- Reduced food intake
- Difficulty/painful swallowing
- Diminished gastrointestinal uptake (malabsorption, diarrhoea),
- TB (a frequent cause of rapid weight loss)
- Intestinal worms
- Other debilitating diseases e.g cancer
- Intractable vomiting
- Treatment of weight loss
- High calorie and protein feeds
- Treat underlying cause

### 10.2.6 Diarrhoea

Diarrhoea in persons with HIV disease including AIDS can be due to a number of causes including:

- Common pathogens such as *Salmonella* or *Shigella*
- Amoebiasis
- Chronic malabsorption

- Cryptosporidiosis
- Mycobacterium avium complex (MAC) infection
- Isosporidiosis.
- Clostridium difficile infection

#### Investigations

Examine stools for treatable causes e.g. *V. cholera*, *Amoeba*, *Mycobacterium avium complex* (MAC) and *Isosporium*

#### Management

- Rehydration, Oral Rehydration Therapy (ORS)
- Treat underlying cause
- Nutritional therapy
- In persistent diarrhoea among adults with no obvious treatable causes give anti diarrhoeal drugs such as Loperamide

### 10.2.7 Persistent Generalized Lymphadenopathy (PGL)

Lymphadenopathy may be due to a number of causes including those listed below:

- HIV itself. (It is however not a bad prognostic sign.)
- Mycobacterium tuberculosis infection.
- Kaposi's Sarcoma, or lymphomas.
- Other causes e.g. pyogenic bacterial infection

#### Investigations:

- Aspirate the node with a 21G needle and stain the aspirate for acid-fast bacilli (AFB).
- Lymph node biopsy for histological diagnosis.
- Chest X-ray
- FBP and ESR

### 10.2.8 Skin rashes, sores and generalized pruritis.

General causes include:

- Generalized pruritic papular eruption (PPE).
- External parasites e.g scabies
- Generalized fungal skin infections.
- Herpes zoster
- Herpes simplex
- Kaposi sarcoma
- Generalized bacterial skin infection e.g., Impetigo

#### Investigations:

- Exclude scabies, bacterial and fungal infections for which treatment is available.
- Skin scraping for fungal element
- Pus swab for culture and sensitivity

#### Management;

- Treat the underlying cause

- Treatment for PPE is generally unsatisfactory, but could be helped by use of antihistamine and in case of secondary infection appropriate antibiotics eg cloxacillin or erythromycin.

### 10.2.9 Altered mental status and persistent severe headache

Amongst the numerous causes of altered mental status and severe headache are:

- Severe dehydration
- Hypoglycemia
- Bacterial and/or fungal meningitis
- Toxoplasma encephalitis
- HIV-dementia
- Depression
- Psychotic conditions
- In altered consciousness, cerebral malaria must always be excluded since this is a common and curable infection.

Investigations:

- Blood slide for malarial parasites
- Lumbar puncture for CSF examination including Indian ink stain for cryptococcal meningitis
- Salmonella and syphilis serological tests
- Blood cultures and sensitivity studies.

## 10.3 Prophylactic treatment of common opportunistic infections in HIV and AIDS

Many opportunistic infections can be prevented by the use of Co-trimoxazole prophylaxis. The diseases include; Bacterial pneumonias, Pneumocystis jiroveci pneumonia, and Toxoplasmosis.

### 10.3.1 Prophylactic treatment using Cotrimoxazole (CPT)

Indications:

- In HIV and AIDS patients, starting with WHO Stage 3 (see Chapter 11 for staging criteria)
- All adult persons with symptomatic HIV disease including all symptomatic pregnant women after the first trimester and before 37 weeks of pregnancy.
- All children born to HIV positive women from six weeks of age and those identified, as being HIV positive within the first year of life until proven HIV negative or intolerant to Cotrimoxazole or have a CD4+ count > 15%
- Children older than 12 months who have symptomatic HIV disease or CD4+ < 15%.
- Asymptomatic HIV infected individuals with CD4+ counts <200 cells/ml

It should be noted that baseline Liver Function Tests (LFT) and Renal Function Tests (RFT) are required before long term administration of Cotrimoxazole

Dose:

- Adults – One double strength tablet (160/800 mg) or two single strength tablets once a day on a daily basis. For those with < 60kg, see dosing chart, Annexes 3 and 4,
- Children – Cotrimoxazole: see paediatric dosing chart on table 8 and annexes 3 and 4.

Duration:

- Prophylaxis is for life for both adults and children who are not on ARVs.
- For those on ARV's, cotrimoxazole prophylaxis can be stopped if CD4+ is >200
- Children who are born to HIV infected women can stop prophylaxis when HIV infection has been reasonably ruled out and the risk of exposure has ceased.
- Children older than 18 months can continue with the prophylaxis only if the diagnosis of HIV infection has been confirmed by serology

Criteria for stopping:

- Occurrence of severe side effects such as severe cutaneous reactions, or such as fixed drug reactions
- If ART is initiated and CD4+ count is above 200 cells/ml in adults or above 15% in children
- Renal and/or hepatic insufficiency or severe haematological toxicity if anti retroviral agents are used

Follow up:

- Regular follow up initially every month for the first three months, then every three months if the medication is well tolerated.
- It is mandatory to monitor for side effects and adherence. Monitoring includes assessment of skin reactions, measurements of haemoglobin, and white blood counts every six months and when clinically indicated.

### 10.3.2 Preventive therapy against TB in PLHA

The dramatic spread of the HIV epidemic throughout sub-Saharan Africa in the past decades has been accompanied by up to a fivefold increase in the number of TB cases registered by national TB programmes. There is thus a need for strong collaboration between HIV and AIDS and TB programmes. Therefore strategies to control HIV must also include interventions to control TB.

TB preventive therapy is the use of one or more anti-tuberculosis drugs given to individuals with latent infection with *M. tuberculosis* in order to prevent progression to active TB disease. Trials have shown that maximum benefits from TB preventive therapy are achieved in HIV infected patients with evidence of tuberculosis infection as assessed by a positive tuberculin skin test. In these patients, the risk of developing tuberculosis is reduced by about 60% and their survival is also prolonged. However, some benefit is also shown in HIV positive groups in general, regardless of the tuberculin test result.

TB preventive therapy is an intervention that should be part of the package of care for people living with HIV. However it should only be offered in the following situations (prerequisites):

- Availability of quality voluntary counselling and rapid testing for HIV
- Effective screening for active TB before initiating TB preventive therapy
- Capacity for follow up and monitoring of patients to encourage adherence to preventive therapy in order to address eventual side effects and exclude active TB disease
- IPT will be provided to eligible clients through collaboration between NACP and NTLP

**Table 11: Strategies to Exclude Active Tuberculosis before initiating Isoniazid Preventive Therapy (IPT)**

**It is essential to exclude active tuberculosis in every patient prior to starting preventive therapy. This is critical in order to avoid drug resistance when drugs are given to patients with TB disease who require the full regimen.**

**Symptoms and signs to be noted**

Patients for TB preventive therapy should be specifically asked about signs and symptoms of tuberculosis:

- Cough > 2 weeks
- Fever > 2 weeks
- Night sweats
- Weight loss of > 1.5 kg in the past 4 weeks: Weight should be measured at each clinic visit to allow documented evidence of weight loss. A weight loss of >1.5 kg should be considered a positive screen indicator.
- Pleuritic chest pains and haemoptysis
- Other symptoms suggesting extrapulmonary TB

**Investigations to be done**

All patients with 1 or more signs and symptoms must be investigated further for TB and are not immediately eligible for TB preventive therapy: 3 sputum specimens must be collected for the following investigations:

- 2 sputum samples for microscopy
- 1 sputum for culture

Chest x-ray is recommended in the screening for TB Preventive therapy, and has an important role in those who are TB suspects with negative sputum smears as per the national TB guidelines.

***Eligibility for TB Preventive Therapy***

All HIV positive people with no signs and symptoms suggestive of active TB and with positive tuberculin skin test are eligible for TB preventive therapy.

Tuberculin skin test should be offered to all HIV infected individuals where possible. Staff should be trained to provide quality tuberculin skin test using the Mantoux technique.

For patients with history of TB treatment:

- Patients who had active tuberculosis in the past 2 years should not be considered for preventive therapy.
- Patients who were treated for tuberculosis more than 2 years earlier may be considered because they may have already been re-infected with TB.
- Patients on anti-retroviral therapy should not be offered TB preventive therapy, as there is currently no evidence of added benefit.
- Patients who receive TB preventive therapy and who require to start antiretroviral therapy can complete their TB preventive therapy even if the ART is started as there is no interaction between isoniazid and the current ART regimen used.

**Recommended Regimen**

The standard regimen for TB preventive therapy is: Isoniazid (INH) daily 5 mg/kg/day (maximum 300 mg per day). The recommended duration is: 6 months. At this stage the intervention should be given once only and the protective effect is expected to last for 18 months.

## 10.4 Treatment of Opportunistic Infections:

This guideline recommends below how to identify and handle treatable causes of morbidity in HIV infected individuals.

All efforts should be made to deal with all treatable conditions in people with HIV and AIDS. These conditions will be managed at various levels of care from dispensaries to national level health care facilities, requiring early detection, treatment and referral accordingly.

### 10.4.1 Viral infections

Viruses that are commonly associated with HIV and AIDS include:

- Herpes simplex virus
- Varicella zoster virus
- Human papilloma virus

#### **Herpes simplex virus infection (HSV)**

Clinical features:

Classical presentation of primary HSV infection includes

- Fever
- Lymph node enlargement
- Small painful vesicles
- Painful ulcers on the mucosa and skin
- Pain along gluteal and upper thigh muscles (Sacral radiculomyelitis) may occur with genital/rectal HSV

Lesions usually resolve within 10-21 days after primary infection. The HSV then becomes latent in trigeminal and sacral nuclei and may reactivate.

Clinical features common in those with HIV and AIDS include:

Persistent/erosive genital/peri-rectal ulcerations which are mainly associated with HSV-2

More recurrent herpetic lesions.

Diagnosis

The diagnosis is usually based on clinical history and physical findings. Laboratory tests include serology, culture, immunofluorescence or immunoassay

Treatment

For mild and moderate cases of HSV, give Acyclovir 400mg orally three times daily for 7 days and for severe and recurrent HSV give Acyclovir 800mg orally, five times daily for 5 days.

#### **Varicella-zoster virus (Herpes zoster or shingles)**

Clinical features

Early symptoms include pain (often severe and radicular) and fever followed 2-4 days later by vesicular rash over involved dermatomes. Primary varicella-zoster virus (VZV) infection usually results in chicken pox.

However primary VZV infection in immuno-compromised persons may be associated with the following:-

- More numerous lesions
- Disseminated disease associated with pneumonitis, hepatitis and hemorrhagic skin lesions.
- CNS manifestations including encephalitis and cerebellar ataxia
- Prolonged healing time
- Bacterial super-infection
- Herpes zoster in HIV infected individuals may be more severe, with more recurrences and may involve more dermatomes

#### Diagnosis

Diagnosis of herpes zoster is usually based on findings of characteristic painful skin lesions at different stages of evolution (erythema, papule, vesicles, crusts).

#### Treatment

- Analgesics are indicated, but the pain may be refractory even to potent analgesics.
- Acyclovir 800mg 5 times per day for 7days.
- With disseminated VZV or ophthalmic nerve involvement give IV/Oral Acyclovir 10 mg/kg/day 8 hourly, for 7 days
- Erythromycin or Cloxacillin 500mg three times daily for 7 days for bacterial super-infection.
- Post-herpetic pain: give Paracetamol/Aspirin or Diclofenac, also Amitriptylin 25-50mg nocte
- Use of steroids (prednisolone) in herpes zoster is not recommended in this set up

### 10.4.2 Bacterial infections

Bacterial infections that occur with increased frequency in children with HIV and AIDS include:-

- Respiratory infections: Streptococcal pneumoniae, Haemophilus influenzae
- Septicemia: Non typhoid salmonella, Pseudomonas aeruginosa
- Cutaneous infections: Staphylococcus aureus

NB. Treatment is the same as in non- HIV infected individuals.

### 10.4.3 Fungal infections

Fungal infections commonly found in association with HIV and AIDS include: *Cryptococcus neoformans*, *Pneumocystis pneumonia*, *Candida species*, *Histoplasma capsulatum* and several others.

#### **Cryptococcus neoformans**

Major cause of meningitis in HIV infected persons and disseminated disease may occur. Contrary to bacterial meningitis, fever may be absent in these cases. Diagnosis depends on demonstration of positive CSF Indian Ink preparation.

#### Treatment

- The preferred regimen is Amphotericin B 0.7mg/kg/day IV and 5 Fluorocytosine 100m/kg/day orally for 14 days, for induction phase, then Fluconazole 400mg/kg/day for 8 weeks until CSF is sterile (consolidation phase)
- Maintenance therapy is Fluconazole 200mg per day (suppressive phase)

- Fluconazole I.V. 400mg/day x 10 days until the patient can take orally then continue with the same dose for 10 weeks. Thereafter maintain 200 mg daily on alternate days as secondary chemoprophylaxis

## **Candidiasis**

Is the most common fungal infection in HIV and AIDS.

Clinical manifestations depend on the site of disease which include oral, pharynx, esophagus, vagina, etc.

NB. Candidiasis in the esophagus, trachea, bronchi or lungs is diagnostic of AIDS

Diagnosis:

The diagnosis is mainly based on clinical findings.

Treatment:

The following drugs are recommended:-

- Miconazole nitrate
- Clotrimazole
- 2% sodium benzoate solution
- Nystatin oral suspension
- Fluconazole 150mg/day or 200mg/day for 2-3 weeks (for oro-pharyngeal candidiasis and others).

NB. Treatment is continued until symptoms resolve

## **Pneumocystis pneumonia (PCP)**

Quite common in Tanzania especially among HIV infected children.

Clinical presentation:

- Non-productive cough, fever, chest tightness and shortness of breath that has evolved over 2-4 weeks.
- Chest signs may be minimal despite severe shortness of breath
- CXR may show diffuse and symmetrical increased interstitial markings to diffuse alveolar pattern with infiltrations characterized by asymmetry, nodularity or cavitations. Chest radiograph may appear normal in 10-30% of patients.

Diagnosis

In our circumstances diagnosis is based on clinical presentation and exclusion of other common causes of severe dyspnoea.

Treatment of PCP

- Trimethoprim 12-15 mg/kg/day + Sulphamethoxazole 75 mg/kg/day - PO/IV for 21 days in 3 divided daily doses,
- or Cotrimoxazole 1920 mg 3 times /day for 21 days

For those allergic to sulpha:

- Trimethoprim 12-15mg/kg/day + Dapsone 100mg/day for 21 days

Prophylaxis therapy for PCP

- Give Trimethoprim-sulphamethoxazole (TMP-SMX) as shown above.

## 10.4.4 Protozoa

### Toxoplasma encephalitis

Clinical features

- Focal paralysis or motor weakness depending on area affected
- Neuro-psychiatric manifestation corresponding to the affected area in the brain
- Altered mental status (forgetfulness etc.)

Diagnosis

Predominantly based on clinical findings after exclusion of other common causes of neurological deficit. If available, a CT scan is very useful for confirmation.

Treatment

- Acute infection:
- Tabs Sulphadiazine 1 gm 6hourly + Tabs Pyrimethamine 100mg loading dose then 50mg /day + Tabs Folic acid 10mg /day for 6 weeks.

After six weeks of treatment

Prophylaxis therapy:

- Tabs Sulphadiazine 500mg 6hourly + Tabs Pyrimethamine 25-50mg /day + Tabs Folic acid 10mg /day.
- For those allergic to sulphur:
- Replace Tab Sulphadiazine with capsule Clindamycin 450mg 6 hourly.
- Discontinue maintenance therapy when CD4 count > 200 cells/ml for 6 months, initial therapy completed and patient is asymptomatic

### Primary prophylaxis therapy for toxoplasmosis

Tabs Trimethoprim – Sulphamethoxazole (TMP-SMX) 160/800mg orally/day.

*For those allergic to sulphur, give Tab Dapsone 50mg/day + Tab Pyrimethamine 50mg per week + Tab Folic Acid 10 mg 3 times a week.*

### Intestinal protozoa

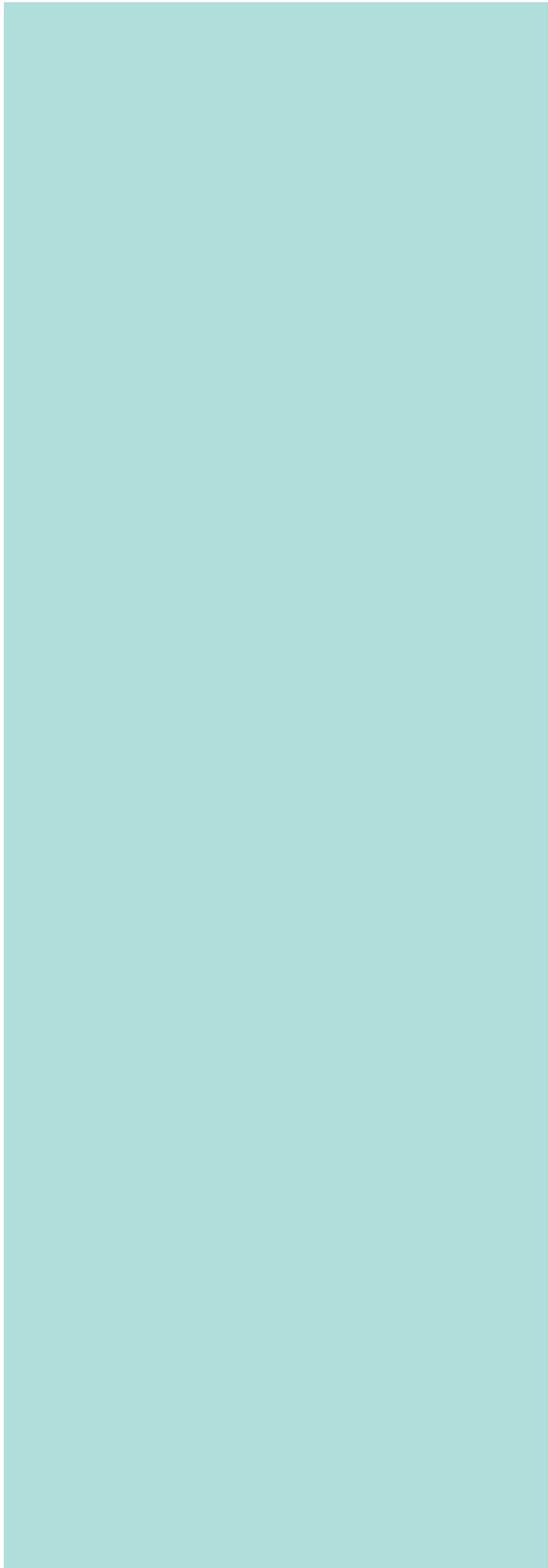
For intestinal protozoa which is a common cause of diarrhoea and difficult to diagnose, the recommended treatment: Tabs Albendazole 800mg BD for one week.





## **Chapter 11**

# Management of Mental Health Problems in HIV and AIDS



### 11.1 Introduction

As in any chronic illness, mental health problems are often found in HIV-positive persons. Any change in mental state, either acute or chronic, must be evaluated immediately in order to determine if it arises from a pre-existing medical or mental disorder or if it is caused by HIV or an OI. ART drug side effects or systemic illness can also result in changes in mental health status. When patients present with altered mental health status, they should be evaluated for drug side effects and systemic illnesses as a result of conditions that have already been mentioned elsewhere. These include hypoxia, sepsis, uremia, acid base disturbances, hepatic encephalopathy etc.

Changes in mental health status can be the result of neurological or mental complications of HIV and/or AIDS. For purposes of clarity a distinction is made between symptoms that are a result of:

#### **Primary neurological complications with secondary mental manifestations**

- Focal neurological changes suggestive of a mass lesion (acute organic brain syndrome)
- Meningitis (acute organic brain syndrome)
- Non-focal or global mental status changes (chronic organic brain syndromes)
- AIDS related mania

#### **Primary mental complications**

- Adjustment disorders
- Depression
- Anxiety disorders
- Substance abuse disorders
- AIDS related mania

A diagnostic approach based on clinical presentation should be used to successfully approach neurological and mental complications of AIDS in settings where expensive investigations such as brain scans and magnetic resonance imaging may not be available.

The aim would be to determine if the presentation represents:

- Focal neurological changes suggestive of a mass lesion
- Meningitis (acute organic brain syndromes)
- Global mental status changes (chronic organic brain syndromes)
- Primary mental complications

### 11.2 Neurological complications with secondary mental manifestations

#### **(a) Focal neurological changes suggestive of a mass lesion**

- Urgent consideration should be given to all patients presenting with changes in mental state, new onset seizures, or fever and neck stiffness.
- Clinical assessment for evidence of focal neurological signs and increased intracranial pressure should be made before attempting a lumbar puncture.

The causes of focal neurological conditions that should be considered include:

- Tuberculosis:
- Primary CNS lymphoma
- Infectious lesions: toxoplasmosis, cysticercosis.

## **(b) Meningitis**

If a mass lesion has been ruled out clinically (absence of raised intracranial pressure), a lumbar puncture should be performed. Meningitis is a common syndrome amongst HIV positive persons.

- Meningitis due *Mycobacterium tuberculosis*, *Streptococcus pneumoniae*, *Hemophilus influenzae*, *Neisseria meningitidis*, *Listeria monocytogenes* and neurosyphilis can occur at any CD4 count
- Meningitis due to *Cryptococcus neoformans*, *Histoplasma capsulatum* and *Mycobacterium tuberculosis* are common in persons with lower CD counts (<50 cells/mm<sup>3</sup>).

*Mycobacterium tuberculosis* is very difficult to diagnose by spinal fluid smear or culture. Other investigations consistent with *Mycobacterium tuberculosis* meningitis should be conducted for all suspected meningitis patients including pulmonary and lymph nodes examinations, sputum for acid fast bacilli and chest radiographs. Guidelines for management of meningitis should be followed while waiting for spinal fluid culture results for bacterial meningitis and microscopic examination using India ink stain which will identify 60-80% of spinal fluid with *Cryptococcus neoformans*, while culture identifies up to 95%.

### **11.3 Changes in mental status: Delirium (acute organic brain syndrome)**

Delirium is a condition where acute changes in global brain functioning occurs. Delirium can occur in patients with focal brain lesions as well as meningitis. The behavioral manifestations of delirium can be misdiagnosed as a functional psychosis and delay recognition of an underlying treatable organic brain disease. It is important to recognize delirium, as it is often an early manifestation of the conditions mentioned in (a) and (b) above and often precedes the more severe disturbance of consciousness – coma.

The central features of delirium that distinguishes it from acute functional psychoses include impairment in orientation and memory (test for registration and immediate recall) that manifests as poor recall of recent events, misidentification of people, fear and loosely held persecutory ideas. It is important to formally assess orientation and memory, rather than depend on just observations of the patients behavior as changes in behavior are often seen in both patients with functional and organic brain syndromes and are not sufficiently specific for either condition to allow for distinguishing one from the other.

Less sedating major tranquilizers such as Haloperidol should be used at low doses (3 - 9 mg daily, titrate dose to response making changes in drug dose after one hour of observation of effects if acutely agitated on day of initiation of parenteral treatment and at least after 3 days of observation of effects if on oral medication) to control these symptoms, while treating underlying causes of organic brain disease. The choice of Haloperidol is also because it does not lower the seizure threshold and thus does not predispose patients who are already vulnerable to developing seizures to have them.

Assess after patient calm – usually after one week of treatment, to rule out underlying depression, mixed depression and anxiety or anxiety disorder and treat accordingly.

## **11.4 Changes in mental status: AIDS (related) dementia chronic (ADC) (chronic organic brain syndrome)**

More gradual changes in mental health status occur with ADC characterized by:

- Gradual decline in cognitive functioning: Impairments in attention and concentration, verbal memory (e.g. word finding), mental slowing, arithmetic calculations, visuospatial memory, visuomotor coordination, complex task sequencing. Later global cognitive impairment and mutism sets in.
- Specific deficits in the integration of motor functioning: unsteady gait, loss of balance, slowed fine motor speed, tremors, changes in handwriting, weakness. Later seizures decorticate posturing, myoclonus, spastic weakness and frontal release signs are not uncommon.
- Behavioural problems: slowed speech and response time and personality changes earlier on, followed by hallucinations and delusions.
- Affective changes: Apathy, loss of interest and friends and others and irritability.

ADC causes significant decline in occupational and social functioning similar to other sub-cortical dementias that affect the white matter of the brain that lies underneath the grey matter.

Patients may not be aware of these changes and they may occur with other mental conditions making diagnosis difficult. It is also a more emotionally difficult diagnosis for patients to accept as while physical ill health is expected, cognitive decline is not, and most patients are relatively young. The profound implications to self-esteem, self-care and legal ramifications have to be considered in a comprehensive management plan.

ADC occurs in 20-30% of patients with CD4+ T-lymphocyte count less than 100 cells/mm<sup>3</sup>. Where available, brain imaging will show atrophy and non-specific white matter changes. ART medication slows the progression to ADC, and other drug treatment is often symptomatic (e.g. small doses of sedatives, for sleep disturbances). There are few treatment options for ADC, and clinical improvement is not usually maintained for long periods of time.

## **11.5 Changes in mental status - AIDS Related Mania**

Manic symptoms that include elated or irritable mood (either occurring acutely or sub-acutely but sufficient to disrupt normal functioning) associated with decreased sleep and perceived need for sleep, increased activity and perceived increased energy, intrusiveness and disinhibited behavior can occur in the late stages of AIDS. These symptoms may accompany ADC or in some cases have been observed to be the first feature that suggests HIV infection. It is a condition, however, more common in the late stages of AIDS and must be differentiated from bipolar disorder that is a functional mental disorder.

- ART treatment relieves the symptoms of AIDS mania
- Mood stabilizing drugs such as carbamazepine (used at doses for treatment of epilepsy) have been noted in the Tanzanian context to be useful for the control of acute symptoms (anecdotal observations).
- When carbamazepine is prescribed, drug doses should be reviewed within one-two weeks of treatment as the carbamazepine induces liver enzymes.

## **11.6 Mental complications**

If the presentation is negative for focal deficit or meningitis, then mental complications should be

considered. As in any chronic illness, mental health problems are often found in HIV-positive persons. The most common mental disturbances that can occur at any CD4 level are adjustment disorder, depression, mixed depression and anxiety and anxiety disorders.

### **11.6.1 Adjustment disorder**

This condition occurs predominantly at the time of HIVD (HIV disease) diagnosis and the disorder includes acute and chronic adaptation responses to HIVD diagnosis. They include fear of discrimination and imminent death, guilt over infecting others, exacerbation of existing mental conditions and acute suicidal ideation.

However, with each stage of HIVD progression patients have to adapt to changes in their lives brought about by each new symptom and loss events such as death of intimate partner or child as a result of an AIDS related condition. The nature of adaptation responses will influence the patient's ability to:

- Disclose their sero-status to others and HIV related self stigmatization has been noted to be a major barrier to sharing test results, prohibiting access to social support that may protect patients from many other mental health consequences of HIVD
- Adopt safer sexual practices
- Adopt safer infant feeding options for postnatal mothers
- Access medical and mental care
- Define those involved in their care.
- Supportive medical/clinical counseling is the mainstay of more positive adaptive responses to HIVD diagnosis. Supportive counseling should address issues of disclosure, safer sexual and other health promoting behaviors including accessing health care, lifestyle changes to adjust work and family needs to physical and emotional impacts of illness, adherence to medication, enhancing decision-making regarding work and providing for family, maintaining relationships and managing normal developmental issues in the context of uncertainty of the progression of illness and dealing with the untoward effects of illness and/or treatment. In later stages of HIVD supportive counseling should address planning for the care of family members and decisions about end of life and preparation for death.
- Adherence: Requires special attention to optimize the clinical outcome of patients on especially ART. Comprehensive support strategies and structures are to minimize loss to follow-up. While direct observed treatment (DOT) has been used in some settings to ensure adherence; other strategies include working with an identified care provider in the home providing support to the patient for regular use of ART, and providing treatment for the family. These approaches are an adjunct to supportive counseling provided at the clinic for regular medication use strategies, drug therapeutic and adverse reactions, monitoring of HIVD progression, monitoring of implementation of risk reduction strategies and stressing secondary prevention messages.

Counseling may be provided on a one to one basis with trained counselors or as counselor facilitated support groups, that are useful for addressing common problems faced by patients with HIVD such as adherence to drug treatments, dealing with untoward effects of illness and drug treatment, coping with HIV related stigma,

### **11.6.2 Major Depressive Disorder**

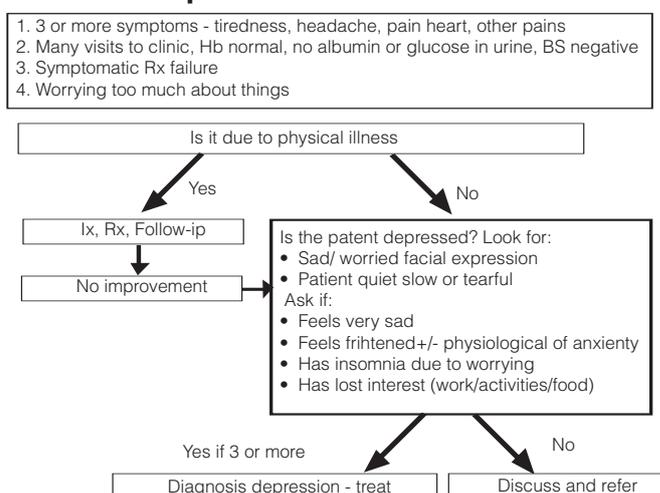
Depression is a common reaction to a life threatening and stigmatized disease such as HIV and AIDS. Depression is often precipitated and maintained by economic stressors and social upheavals, both of

which persons with HIV and AIDS are exposed to; leaving them vulnerable to a higher risk of depression, than in the general population and in persons with other chronic illnesses. Depression is a treatable condition it is debilitating and should never be discounted as a normal reaction. The diagnosis is syndromal and is made when at least five of the following symptoms occur:

- Depressed mood or loss of hedonic tone must be present for more than 2 weeks and cause significant difficulties in normal functioning
- Depressed mood often will not spontaneously be volunteered; the depressed mood may be attributed to physical ill health but may on probing be noted to precede physical symptoms.
- Loss of hedonic tone is manifest in loss of pleasure and interest in normal activities and the need to force oneself to do things
- Any four of the following also need to be present for diagnosis
- Excessive worry, with or without physiological symptoms of anxiety; Fatigue, loss of energy; Psychomotor retardation – manifest in slowing down of thinking with long pauses before responding to questions, increased time required to complete usual activities, complaints of feeling heaviness or numbness in the feet; Pain symptoms (head-ache, chest-pain, back-ache etc); Sleep disturbances either insomnia or hypersomnia; decreased appetite; weight loss; decrease in sexual desire, decrease in attention and concentration and constipation.
- 15% of people that are depressed for more than a year commit suicide. Suicide risk must be assessed and if moderate or high should be addressed accordingly.
- See algorithm below (table 12)

Management of depression includes the use of an antidepressant (selective serotonin reuptake inhibitors such as fluoxetine are recommended in HIV and AIDS), at adequate doses and for adequate duration; combined with supportive counselling. Symptoms often decrease over three weeks of treatment. Improvements in sleep pattern should be expected in the first week, greater activity in the second week and improved mood and energy in the third week. Dose should be titrated on a weekly basis against effects starting with building from 25 mg nocte to the therapeutic dose of 50mg nocte within three days of initiating treatment for imipramine and amitriptyline and starting with a therapeutic dose of 20 mg during the morning for fluoxetine. Relapse prevention duration of treatment of 6-9 months is required at the antidepressant dose that treated the depressive episode. Good prescribing practices that includes information about depression, therapeutic and adverse effects of drugs have been shown to improve adherence. See box below for interactions with drugs use in ART.

**Table 12 : Algorithm for depression**



**Table 13: Antidepressants and ART interactions**

Drug groups	Specific drugs/ registered Tanzania	Dose range (mg)	Interactions with ARVs
Heterocyclic - Tricyclic	Amitriptyline Imipramine	50 – 150	Lopinavir/r & ritonavir increases antidepressant (AD) level
SSRI's (serotonin specific re-uptake inhibitors)	Fluoxetine Fluvoxamine	10-80	Niveripine decreases AD level; AD Increases levels of Amprenavir, Delavidine, Efavirenz, Indinavir, LPV/r, Ritonavir, Saquinavir

### 11.6.3 Alcohol and substance use disorders

All patients seen for ART treatment should be assessed for alcohol and other drug use as part of lifestyle assessment. Alcohol use should raise concern if more than 5 units of alcohol are used per week (table 14); ideally patients should be advised to stop drinking if possible. Use of other drugs should raise concern, the common drugs used/abused in this context being cannabis in its marihuana form, inhalants (amongst adolescents), khat, heroin and to a lesser extent cocaine. For both alcohol and other drug use, concern is raised due to the disinhibiting effects of use that inhibit HIV and AIDS risk reduction plans implementation, effects on immune status (alcohol and cannabis), and as potential barriers to adherence. Heroin and free-based cocaine use has the additional transmission risk through un-sterile needles for intravenous drug users.

In patients with alcohol and drug use problems, these should be addressed in counseling sessions. The focus should be on risk assessment, risk reduction planning and supportive counseling for implementation and review of planned strategies. Failure to help the patient address the problem may require referral to mental health services at the district level.

### 11.6.4 Bereavement and bereavement counseling

Bereavement is defined as the loss of something dear to a person. The objectives of bereavement counseling are normalizing the loss and exploring the losses that the PLHA has experienced. When one is bereaved they go through six stages of bereavement which include: shock, denial, anger, bargaining depression and acceptance.

**Table: 14 Alcohol equivalence conversion table**

Type of alcohol	Amount equivalent to one unit (15 mls alcohol)
1. Spirits (licit or illicit)	30 mls
2. Traditional alcohol beverages (Komoni, wanzuki, mbege, mnazi, dengelua etc) (estimate)	½ litre
3. industrial Beer 3-4%	300 mls

- Some PLHA may have a clear wish to die in their homes or birthplace.
- They may also have wishes as to who they would want to be with when they die

Counseling for bereavement also takes the form of counseling those left behind especially during the early stages of the loss, when crisis and events of similar types of deaths occur or when the carer had grieved and come to acceptance of the impending death even before it occurs.

- While helping those left behind it is important to recognize that there is no “natural” length of mourning. The purpose of counseling is to help the bereaved person to reduce the emotional reaction due to loss and shorten the period of mourning and grieving. This is by reassuring the person left behind, helping them let go, deal with the guilt and avoidance of situations that remind them of the dead person. Making those left behind think what the deceased would have wanted them to do and writing letters to deceased person as a way of letting go. In some rare situations employ empty chair technique so that the person left behind can have a dialogue maybe an important step in resolving unresolved situations.
- Care provider's feelings of loss: care providers feelings of loss begin with meeting an HIV positive person who is also involved in a mourning process especially with the constant awareness that the client has a chronic life threatening illness which consciously or unconsciously mirrors on carers previous losses.

The way the health care provider responds to these feelings is by offering health education instead of addressing client's feelings of loss or clients may want to discuss feelings of loss and how to address these positively; health care providers we may send a message that this is not an area for discussion; neglecting to follow-up unwell patients so as to avoid being with the patients' pain and actively prevent contact with the client through rejecting or condescending mode of communication with client.

While in the past our culture dealt with dying as a family affair, social cultural and economic changes and the extent of death with HIV is bringing roles during dying and bereavement closer to the health care profession who have death anxiety similar to that experienced in the community.

## 11.7 Crisis and Crisis Counseling

Is a person's response to a rapid disruption of personal affairs, such as break up of a relationship, an aftermath to earthquake, rape or other forms of assault and an unexpected loss of someone known to them. A crisis situation is a critical situation in which a person is unable to use his/her normal problem solving techniques to resolve a problem. When a crisis occurs it is overwhelming both emotionally and cognitively. In the case of HIV and AIDS, the trigger that leads to crisis might be death of another PLHA, emergence of a new symptom, treatment failure or anything that is perceived as a severe life event. The crisis situation takes the form of a blow, recoil, withdrawal and acceptance. The following describes these

- The blow: The blow is the shock of fearing or realizing that something is wrong. For instance, clients may realize they are at risk, or they have put themselves at risk, or learn that a test result is positive.
- The recoil: The recoil occurs as the person struggles emotionally to come to grips with the full implications of the information. For example, after the blow of a positive test result, the person may

deny and recoil from this new reality and demand a new series of tests in a different clinic.

- **Withdrawal:** Some people can come to terms quickly with and adapt themselves to their predicament. Many withdraw, however, to be alone with their sorrow, anger, depression, or anxiety.
- **Acceptance:** In the last stage, individuals generally use their own psychological resources (or draw on help from counseling) to come through the crisis without a permanent loss of self-esteem and with a restored sense of control. This is called acceptance.

The counselor ought to move quickly to define the problem and restore a sense of control. The counselor should “begin where the client is”. He/she (counselor) should:

- Be reassuring and supportive as the client discusses the crisis
- Listen carefully
- Comment on the strength of the feelings, the fear, or the client’s effort to deal with the problem
- Remain calm
- Accept the client’s fear as genuine

The counselor should not play down the seriousness e.g. saying “you are overreacting”, or panic, or offer false assurance, give advice or take offense with what solution the PLHA may reach or action they may take.

## **11.8 Persons with previous mental disorders**

Persons with previous mental disorders are a high risk group for conditions transmitted by unsafe sexual practices such as HIV and AIDS. Conditions such as schizophrenia and Bipolar disorder do not however appear to be more common in persons with HIVD.

For persons with previous mental illness, as with other clients seen at clinics, risk reduction counseling and strategies should be addressed at each counseling session. Monitoring drug treatments for schizophrenia and bipolar disorder should prevent or decrease relapse of episodes. When episodes do occur they should be treated. Referral to mental health services at the district level should occur and a case management approach used with such services.





## **Chapter 12**

# Management of HIV Infected Patients Using Antiretroviral Drugs



## 12.1 Introduction

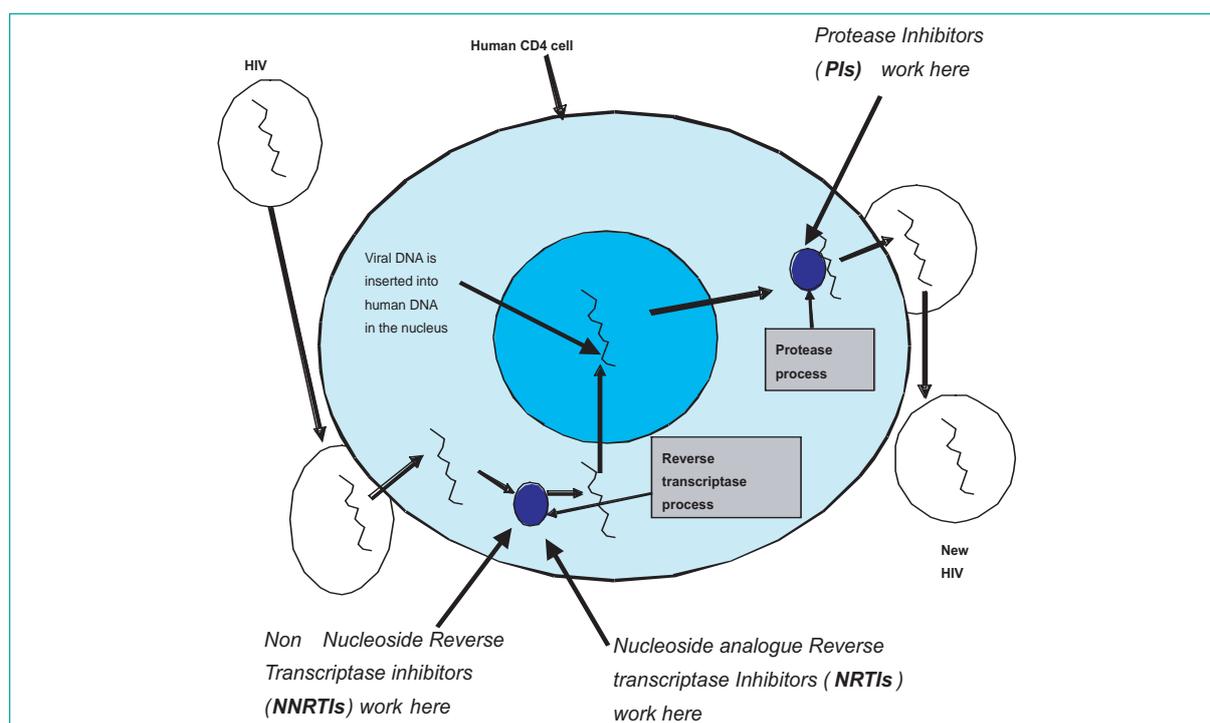
After a decade of slow progress in the treatment of HIV infection, the last few years have seen dramatic advances in the development of antiretroviral drugs (ARV). This now offers extended patient survival and improved quality of life. Various new medications (such as protease inhibitors (PIs) and non-nucleoside reverse transcriptase inhibitors (NNRTIs), when combined with older nucleoside reverse transcriptase inhibitors (NRTIs), have the potential to reduce HIV replication.

The concurrent development of new anti-fungal and antibacterial drugs allows clinicians to hold at bay the most common (and once fatal) opportunistic infections. Determination of CD4+ T lymphocyte counts, and more recently the viral load has allowed more accurate monitoring of disease progression and guide targeted therapy. Technologically advanced tests such as HIV genotyping help identify mutations that confer drug resistance and so give a physician the ability to rationally use existing antiretroviral drugs.

Theoretically the multiple steps in replication of HIV provide opportunities for intervention. Therapeutic regimens may be directed at one or several of the following stages essential for viral replication. (See Fig 4):

- Attachment of HIV to host cell
- Reverse transcription of viral RNA to DNA
- Integration of pro-viral DNA into host genome
- Expression of the viral gene after it has been integrated into host cell DNA including the process of transcription of more viral RNA and the translation of viral proteins.
- Processing and post-translational modification of protein products of the virus.

**Figure 4: Sites of Anti-retroviral (ARV) drugs action**



## 12.2 Types of Antiretroviral drugs

The currently existing antiretroviral drugs fall into three main categories:

- Nucleoside reverse transcriptase inhibitors (NRTIs),
- Non-nucleoside reverse transcriptase inhibitors (NNRTIs), and
- Protease inhibitors (PIs)

### 12.2.1 Nucleoside Reverse Transcriptase Inhibitors (NRTIs)

This class of drugs was the first group of drugs to be used and was the mainstay of antiretroviral therapy for the last 13 years of the AIDS epidemic. The primary mechanism of action of this class is inhibition of viral RNA-dependent DNA polymerase (reverse transcriptase) enzyme.

### 12.2.2 Non-Nucleoside Reverse Transcriptase Inhibitors (NNRTIs)

Similar to the NRTIs, this class of drugs act by disrupting the reverse transcription of viral RNA into DNA which is then incorporated in the cell's nucleus. However, unlike the NRTIs, they are not directly incorporated into the viral DNA but instead inhibit replication directly by binding to the enzyme *reverse transcriptase*. Resistance to these drugs develops rapidly, especially when used alone.

### 12.2.3 Protease Inhibitors (PIs)

PIs competitively inhibit the HIV protease enzyme whose activity is critical for the terminal maturation of infectious virions. This inhibition prevents the maturation of virions capable of infecting other cells.

## 12.3 Treatment using ARV drugs in adults and adolescents

From the moment a patient tests HIV -positive, they should be referred to the CTC. The initial management requires a complete workup of the patient. A complete blood count, renal and hepatic chemical function tests, urine pregnancy test (if pregnancy is possible), and viral load (where available) should be done at baseline.

Treatment decisions will be based on the extent of clinical disease progression. CD4+ T lymphocyte counts remain the gold standard for evaluating immune function. The determination of viral load has more prognostic value and is routinely used in clinical practice in developed countries. These tests, when available, should be done at baseline and as needed for clinical care (e.g., in cases of toxicity), but at least every six months for patients on treatment.

### 12.3.1 Criteria for initiation for ART in Adults and Adolescents Patients

Although there is theoretical benefit to antiretroviral therapy for patients with CD4+ counts  $>200$  cells/mm<sup>3</sup>, a major dilemma confronting patients and practitioners is that the antiretroviral regimens currently available that have the greatest potency in terms of viral suppression and CD4+ T-lymphocytes preservation, are medically complex, are associated with a number of specific side effects and drug interactions, and pose

a substantial challenge for adherence. Furthermore, the development of mutations associated with drug resistance can render therapy less effective or ineffective. Thus, decisions regarding treatment of asymptomatic, chronically infected individuals with CD4+ T-lymphocyte counts  $>200$  cells/mm<sup>3</sup> must balance a number of competing factors that influence risk and benefit.

The treatment of patients with WHO Stage 4 disease (clinical AIDS) therefore should not be dependent on a CD4+ cell count determination. Any individual in Stage IV should be started on treatment. However CD4+ measurement can be helpful in categorizing patients with Stage III conditions with respect to their need for immediate therapy. For example, pulmonary TB can occur at any CD4+ count level and, if the CD4+ cell count level is well maintained (i.e.  $>350$ /mm<sup>3</sup>), it is reasonable to defer therapy and continue to monitor the patient. For Stage III conditions a threshold of 350cells/mm<sup>3</sup> has been chosen as the level below which immune deficiency is clearly present such that patients are eligible for treatment when their clinical condition portends rapid clinical progression. A level of 350cells/mm<sup>3</sup> is also in line with other consensus guideline documents. Any patient with a CD4+ cell count  $<200$ /mm<sup>3</sup> should be started on treatment, regardless of clinical stage.

Based on the above discussion, there are 3 classes of individuals who are clinically eligible to begin treatment:

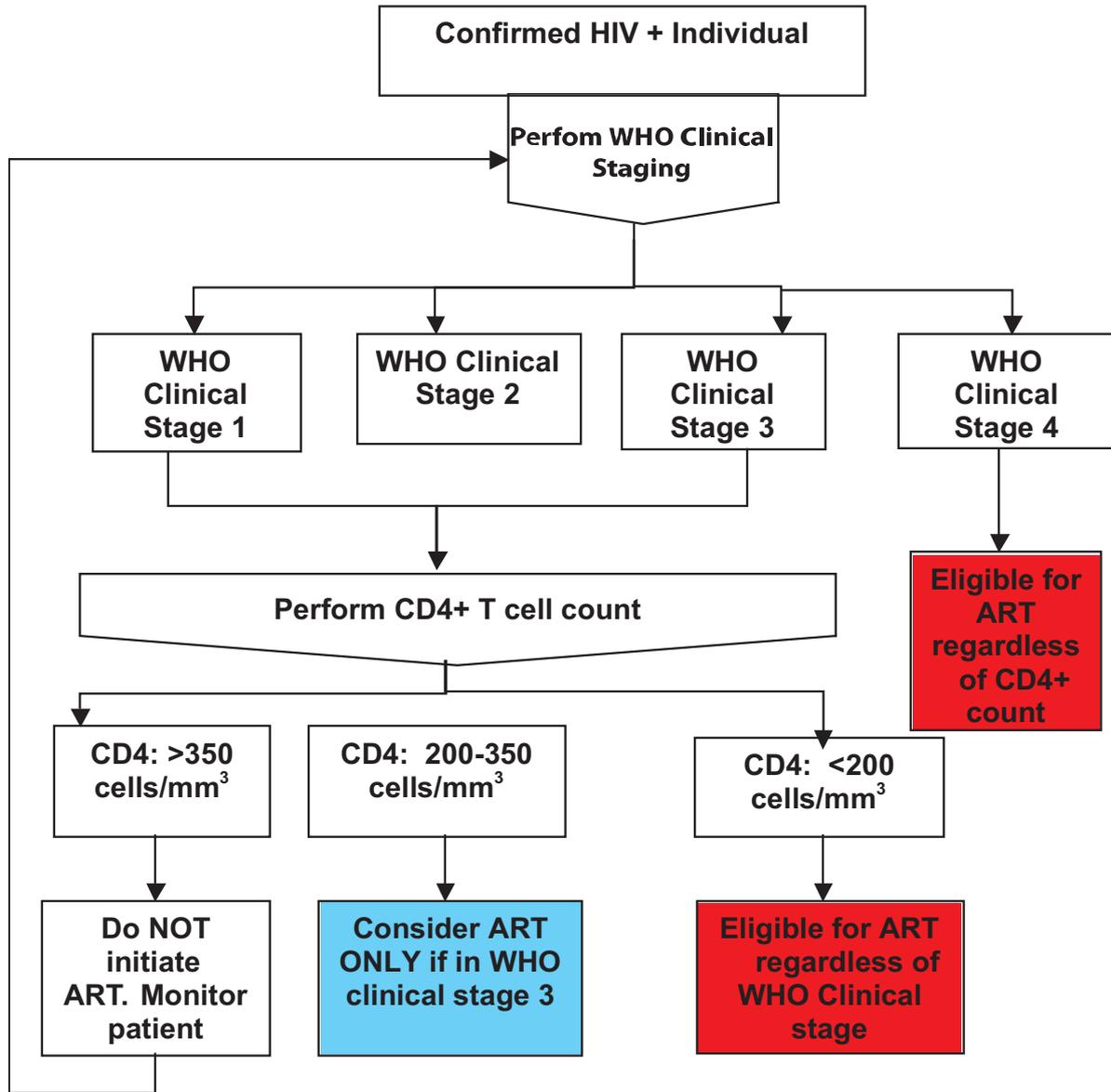
- All who are in WHO stage 4 clinical criteria, regardless of CD4+ cell count
- Those in WHO Stage 3 and CD4+ cell  $\leq 350$ /mm<sup>3</sup> as an indicator of their progression to AIDS.
- All who have a CD4+ count  $\leq 200$ cells/mm<sup>3</sup>, regardless of symptoms

This is summarized in figure 5.

Beyond clinical eligibility, it is important that the patient's willingness, readiness and ability to be on ART adherently be assessed and addressed. Psychosocial considerations (not exclusion criteria) therefore need to be evaluated before initiation of therapy during several (three to six) pre-treatment visits:

- Demonstrated reliability, i.e. has attended three or more scheduled visits to an HIV clinic.
- No active alcohol or other substance abuse that could affect adherence
- No untreated active depression.
- Disclosure: It is strongly recommended that clients have disclosed their HIV status to at least one friend or family member who will become the adherence assistant and, if possible, should join support groups.
- Insight: Clients need to have accepted their HIV positive status, and have insight into the consequences of HIV infection, the role of ART, and the very real need to adhere strictly before commencing therapy.
- Able to attend the CTC on a regular basis (transport may need to be arranged for patients in rural areas or for those remote from the treatment site) or have access to services able to maintain the treatment chain.

Figure 5: Clinical Criteria for ART in Adults and Adolescents



**Table 15: Revised WHO Clinical Staging of HIV Infection for Adults and Adolescents**

For use in those 15 years of age or more with positive HIV antibody test or other laboratory evidence of HIV infection, e.g. viral load

<p><b>Primary HIV infection</b></p> <ul style="list-style-type: none"> <li>• Unrecognized</li> <li>• Acute retroviral syndrome<sup>2</sup></li> </ul>
<p><b>Clinical stage 1</b></p> <ul style="list-style-type: none"> <li>• Asymptomatic</li> <li>• Persistent generalized lymphadenopathy (PGL)</li> </ul>
<p><b>Clinical stage 2</b></p> <ul style="list-style-type: none"> <li>• Moderate unexplained weight loss (&lt;10% of presumed or measured body weight)</li> <li>• Recurrent upper respiratory tract infections (URTIs) (sinusitis, bronchitis, otitis media, pharyngitis) Herpes zoster</li> <li>• Angular cheilitis</li> <li>• Recurrent oral ulcerations</li> <li>• Papular pruritic eruptions</li> <li>• Seborrhoeic dermatitis</li> <li>• Fungal nail infections of fingers</li> </ul>
<p><b>Clinical stage 3</b></p> <p><b>Conditions where a presumptive diagnosis can be made on the basis of clinical signs or simple investigations</b></p> <ul style="list-style-type: none"> <li>• Severe weight loss (&gt;10% of presumed or measured body weight)</li> <li>• Unexplained chronic diarrhoea for longer than one month</li> <li>• Unexplained persistent fever (intermittent or constant for longer than one month)</li> <li>• Oral candidiasis</li> <li>• Oral hairy leukoplakia</li> <li>• Pulmonary tuberculosis (TB) diagnosed in last two years<sup>3</sup></li> <li>• Severe presumed bacterial infections (e.g. pneumonia, empyema, pyomyositis, bone or joint infection, meningitis, bacteraemia)</li> <li>• Acute necrotizing ulcerative stomatitis, gingivitis or periodontitis</li> </ul> <p><b>Conditions where confirmatory diagnostic testing is necessary</b></p> <ul style="list-style-type: none"> <li>• Unexplained anaemia (&lt;8 g/dl), and or neutropenia (&lt;1000/mm<sup>3</sup>) and or thrombocytopenia (&lt;50 000/mm<sup>3</sup>) for more than one month</li> </ul>
<p><b>Clinical stage 4</b></p> <p><b>Conditions where a presumptive diagnosis can be made on the basis of clinical signs or simple investigations</b></p> <ul style="list-style-type: none"> <li>• HIV wasting syndrome</li> <li>• Pneumocystis pneumonia</li> <li>• Recurrent severe or radiological bacterial pneumonia</li> <li>• Chronic herpes simplex infection (orolabial, genital or anorectal of more than one month's duration)</li> <li>• Oesophageal candidiasis</li> <li>• Extrapulmonary TB</li> <li>• Kaposi's sarcoma</li> <li>• Central nervous system (CNS) toxoplasmosis</li> <li>• HIV encephalopathy</li> </ul> <p><b>Conditions where confirmatory diagnostic testing is necessary:</b></p> <ul style="list-style-type: none"> <li>• Extrapulmonary cryptococcosis including meningitis</li> </ul>

- Disseminated non-tuberculous mycobacteria infection
- Progressive multifocal leukoencephalopathy (PML)
- Candida of trachea, bronchi or lungs
- Cryptosporidiosis
- Isosporiasis
- Visceral herpes simplex infection
- Cytomegalovirus (CMV) infection (retinitis or of an organ other than liver, spleen or lymph nodes)
- Any disseminated mycosis (e.g. histoplasmosis, coccidiomycosis, penicilliosis)
- Recurrent non-typhoidal salmonella septicaemia
- Lymphoma (cerebral or B cell non-Hodgkin)
- Invasive cervical carcinoma
- Visceral leishmaniasis

<sup>2</sup> Acute febrile illness 2-4 weeks post-exposure often with lymphadenopathy and skin manifestations, pharyngitis.

<sup>3</sup> TB may occur at any CD4 count, and this must be considered where available. If CD4 is less than 200 it should be considered as a stage 4 event. Diagnosis and treatment of both pulmonary and extrapulmonary TB should be in line with international and national guidelines.

### 12.3.2 Before initiating therapy

Before initiating therapy in any patient, the following evaluation should be performed:

- Conducting laboratory tests including: complete blood count, chemistry profile (serum transaminases, creatinine and lipid profile), (CD4 + T-lymphocyte count where available) to establish baseline parameters for later monitoring
- Performing a chest X-ray, hepatitis C serology, ophthalmologic examination, etc.
- Educating the patient, as well as family members if the patient wishes, on HIV and AIDS, the need for adhering to the agreed treatment plan, and the importance of attending follow up visits and family needed support to the patient.
- Where possible, measurement of Viral load
- General orientation of the patient and family members should be done, including:
  - Who and where to call for refills
  - Who and where to call for clinical problems
  - Who and where to call for social, spiritual and legal problems which might interfere with adherence to treatment.

### 12.3.3 Goals of Therapy

Eradication of HIV infection cannot be achieved with currently available antiretroviral regimens; this is due to the establishment of a pool of latently infected CD4+ T-lymphocyte cells during the very early stages of acute HIV infection that persists with an extremely long half-life, even with prolonged suppression of plasma viraemia to <50 copies/mL.

**Primary goals of antiretroviral therapy therefore are:**

- Maximal and durable suppression of viral load
- Restoration and/or preservation of immunologic function
- Improvement of quality of life
- Reduction of HIV-related morbidity and mortality

### **Secondary goals are to decrease the incidence of HIV through;**

- The increased uptake in voluntary testing and counselling with more people then knowing their status and practicing safer sex,
- The reduction of transmission in discordant couples, and
- Reducing the risks of HIV transmission from mother to child.

In order to achieve these goals the following strategies should be used:

- Adequate counselling and creation of supportive environment for patients to maximize adherence to the antiretroviral regimen
- Rational sequencing of drugs for the preservation of future treatment options
- Monitoring of drug resistance in selected clinical settings, monitoring of toxicities and adverse drug reactions
- Given the existing antiretroviral drugs it is important that prescribers understand when to start antiretroviral drugs as described above. They also need to know:
  - Which drugs to use and in which order
  - When to change therapy
  - Which drugs to use when changing therapy

## **12.4 Recommended ARV drugs in Tanzania**

### **12.4.1 Introduction**

The use of single drugs in the treatment of HIV infection is not recommended. Antiretroviral therapy both in naïve patients and those who had received treatment before, involves the use of combinations of drugs. A triple therapy consisting of 2 NRTI + 1 NNRTI or 2 NRTI + 1 P1 is recommended. There is no single combination that is best for every patient and that can be tolerated by all. Regimens should be recommended for patients based on their clinical condition, lifestyle, and ability to tolerate the regimen. Below are the recommended first line drugs combinations in Tanzania.

### **12.4.2 First line ARV combination regimen for adults and adolescent ART naive patients**

The MoH recommends four different combinations of drugs for adults and adolescents. The combinations will be used according to indications and contraindications that govern the use of ARVs to minimize side effects and drug-drug interactions.

#### **I) Stavudine (d4T)+Lamivudine (3TC)+Nevirapine (NVP) Fixed Dose Combination (FDC) for example Triomune 30 or 40 depending on body weight < or > 60 kg. respectively**

This is the default drug to prescribe for all patients.

It is important to note that Nevirapine challenge dosing is required during the beginning of treatment. Consequently, the one FDC tablet should be taken in the morning, then only d4T and 3TC tablets in the evening for the first 2 weeks of treatment.

Hence **d4T+3TC+NVP (FDC)** as Triomune 30 or 40 o.d. in morning for first 2 weeks and Stavudine 30 or 40 mg/Lamivudine 150 mg o.d. in the evening for first 2 weeks then, if well tolerated, continue at full dose of **(d4T+3TC+NVP (FDC)** as Triomune 30 or 40 twice daily). It is

advisable to check LFT at this stage.

## II) Zidovudine (AZT)+Lamivudine (3TC)+Nevirapine (NVP)

Again, it is important to note that Nevirapine challenge dosing is required during the beginning of treatment. Consequently, the Nevirapine/AZT/3TC (or Nevirapine containing FDC) should be taken in the morning, and only AZT/3TC in the evening for the first 2 weeks of treatment.

Zidovudine 300 mg/Lamivudine 150 mg/Nevirapine 200 mg o.d. in morning for first 2 weeks

Zidovudine 300 mg/Lamivudine 150 mg o.d. in the evening for the first 2 weeks

THEN after 2 weeks, if well tolerated continue at full dose (Zidovudine 300 mg/Lamivudine 150 mg/Nevirapine 200 mg twice daily). Advisable to check LFT at this stage.

Note: For adolescents, AZT is 200 mg 12 hourly for body wt 20-40 kg.

## III) Stavudine (d4T)+Lamivudine (3TC)+Efavirenz (EFV)

Stavudine 40 mg/Lamivudine 150 mg twice daily and Efavirenz 600 mg once daily at night (> 60 kg weight).

Stavudine 30 mg/Lamivudine 150 mg twice daily and Efavirenz 600 mg once daily at night (< 60 kg weight).

Note: For <40kg body weight, EFV dose should be <600mg.

## IV) Zidovudine (AZT)+Lamivudine (3TC)+Efavirenz (EFV)

Zidovudine 300 mg/Lamivudine 150 mg twice daily and Efavirenz 600 mg once daily at night.

Note: For adolescents, AZT is 200 mg bd for body wt 20-40 kg.

For <40kg, EFV dose should be <600mg.

Nb: It is best to verify all doses based on body weight..

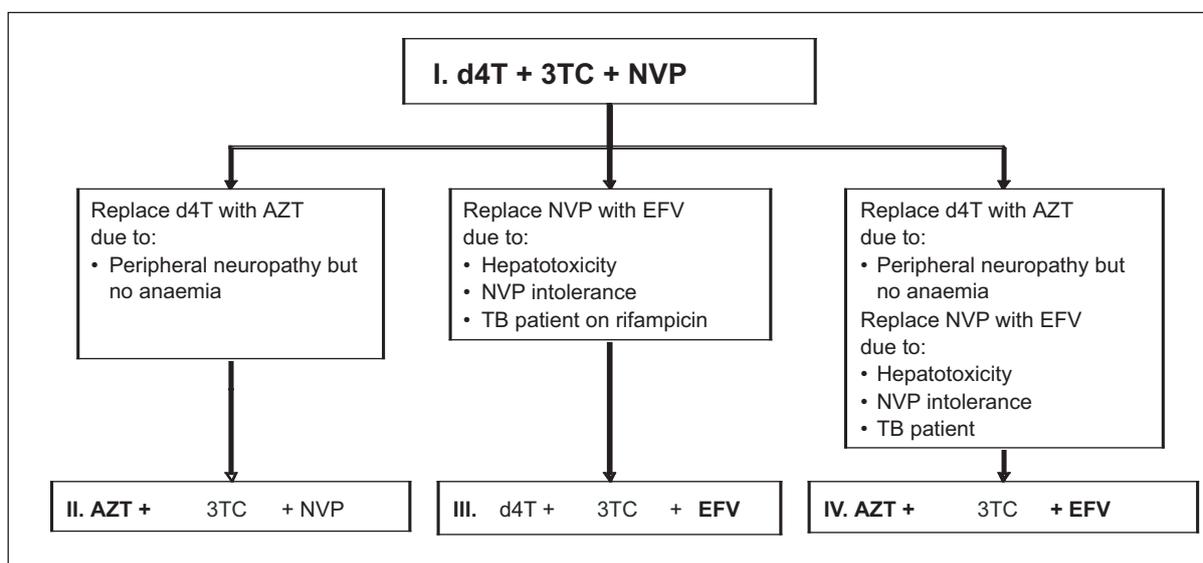
The 1<sup>st</sup> line Regimen in Tanzania can be summarized as follows:

Unless contraindicated, all patients will commence therapy on: **d4T+3TC+NVP**

However patients can be started on:

- AZT+3TC+NVP if there is peripheral neuropathy
- d4T+3TC+EFV if there is TB and anaemia <7.5gm/dl
- AZT+3TC+EFV if there is TB, and no anaemia

**Figure 6 (a): Recommended First line drug regimen in Tanzania**



### 12.4.3 Women of Childbearing Potential or Pregnant Women

The guiding principle for the treatment of women of childbearing potential or pregnant women is that therapeutic decisions should be based solely on their need and eligibility for ART. The special circumstances of pregnancy or breast-feeding raise additional issues concerning toxicity to mothers and children, the choice of ARV drugs, and the prevention of HIV transmission from mothers to infants. The recommended first-line regimen for this patient subgroup is:

#### **AZT + 3TC + NVP**

While d4T might be necessary as a substitute for AZT, close monitoring should be done given the increased risk of lactic acidosis developing due to d4T use.

The choice of ART for women with the potential to become pregnant must involve a consideration of the possibility that the ARV drugs may be received early in the first trimester, before the recognition of pregnancy and during the primary period of fetal organ development. EFV should be avoided in such women because of its potential for teratogenicity. Women who are receiving ART and do not wish to become pregnant should have effective and appropriate contraceptive methods available to them in order to reduce the likelihood of unintended pregnancy. In those women for whom effective contraception can be assured, EFV remains a viable option for the NNRTI component of the regimen. Women who are receiving ART and become pregnant should continue their treatment unless they are in the first trimester of pregnancy and EFV has been part of the regimen, in which circumstances EFV should be discontinued and replaced by NVP.

For pregnant women it may be desirable to initiate ART after the first trimester, although for such women who are severely ill the benefit of early therapy clearly outweighs any potential fetal risks, and therapy should be initiated in these cases. Additionally, the dual NRTI combination of d4T/ddI should be avoided in pregnancy and only used when no other alternatives exist, because of the potential increased risk of lactic acidosis with this combination in pregnant women. Recent studies have shown an increased risk of liver toxicity due to NVP as part of ART for pregnant and non pregnant women above 250cells/mm<sup>3</sup>. Monitoring of liver function when initiating therapy and regular follow up is required for all women on NVP based regimens.

The recommended second line regimen for pregnant women is;

#### **ABC +ddI + SQV/r or NFV**

Several country programmes are already considering the use of short-course triple combination therapy for the prevention of MTCT in women who are not yet in need of treatment for their own HIV infection, and the cessation of therapy postpartum if the women do not require its continuation for their own health. The use of HAART in such situations should prevent the emergence of resistance to the drugs and should also be highly effective in reducing perinatal HIV transmission to infants. However, this intervention also exposes both mother and fetus to potential drug toxicities in situations where therapy is not required for maternal health. Studies are in progress with a view to assessing the safety and efficacy of this approach for women and their infants, particularly for the prevention of MTCT in breast-feeding women.

It is important to note that ARV drugs have the potential to either decrease or increase the bioavailability of

steroid hormones in hormonal contraceptives. The limited data available suggest that potential drug interactions between many ARVs (particularly some NNRTIs and PIs) and hormonal contraceptives may alter safety and effectiveness of both the hormonal contraceptives and the ARVs. It is not known whether the contraceptive effectiveness of progestogen-only injectable contraceptives (such as depot medroxyprogesterone acetate and norethisterone enantate) would be compromised, as these methods provide higher blood hormone levels than other progestogen-only hormonal contraceptives, as well as the combined oral contraceptives. Studies are underway to evaluate potential interactions between depot medroxyprogesterone acetate and selected PI and NNRTI drugs. Thus, if a woman on ARV treatment decides to initiate or continue hormonal contraceptive use, the consistent use of condoms must be recommended for preventing HIV transmission and may also compensate for any possible reduction in the effectiveness of the hormonal contraceptive.

#### **12.4.4 Antiretroviral drugs for non-ART *naïve* patients**

Treatment for patients who have been previously exposed to antiretroviral therapy should be discussed with an antiretroviral expert **before** they are enrolled in the CTC and (re)started on treatment.

Generally:

- Those patients controlled on their antiretroviral medication at appropriate doses should continue on the same regimen if possible.
- Those who stopped for reasons other than treatment failure and for whom failure is not suspected can restart the original regimen.
- Those known or suspected to have failed a previous regimen should be started on drugs they have not been exposed to before, as appropriate.

### **12.5 Adherence to Antiretroviral Therapy**

Adherence to ART is well recognized to be an essential component of individual and treatment success. Studies of drug adherence in the developed world have suggested that higher levels of drug adherence are associated with improved virologic and clinical outcomes and that rates >95% are needed to maximize the benefits of ART. It is a challenge to achieve rates this high over a long period of time and numerous approaches to improving adherence should be sought and tailored to the patient's lifestyle through proper counselling and health education.

#### **12.5.1 Factors that influence adherence**

Some predictors of good adherence to HIV medications have been identified. These include:

- Availability of emotional and practical life supports, including assigning a treatment assistant at home
- The ability of patients to fit the medications into their daily routine
- Patient's understanding that poor adherence leads to resistance development and limits future treatment options
- The recognition that taking all medication doses is important
- Feeling comfortable taking medications in a variety of settings, including in public
- Availability of a clinic capable of monitoring the treatment
- Keeping clinic appointments

## 12.5.2 Strategies that enhance adherence

It is therefore important that all those caring for HIV patients undertake strategies of improving and sustaining adherence to treatment with ARV drugs.

- (i) Patient related strategies
  - In order to improve adherence:
  - Health care workers should negotiate a treatment plan that the patient understands and to which he/she commits.
  - Patient's "readiness" to be on life long medication should be clearly established.
  - Patients must understand that the first ART regimen has the best chance of long-term success.
  - Family members should be recruited to become participants in the plan for treatment.
  
- (ii) Clinician and health team related strategies should include:
  - Building a trusting relationship with patients
  - Provider attitudes and behaviours that are supportive and non-judgmental will encourage patients to be honest about their adherence and about problems they have with adherence.
  - Monitoring and encourage adherence at every clinical encounter.
  - Explain possible side effects when initiating treatment.
  
- (iii) Regimen-related strategy
  - Regimens should be simplified by reducing the number of pills and the frequency of taking drugs
  - Minimizing drug interactions and side effects through rational drug selection.
  - Minimizing differences between medication requirements e.g., with food, without food

## 12.6 Changing of Antiretroviral Therapy

There are multiple reasons which may lead to changing of antiretroviral therapy, including:

- Intolerable side effects,
- Drug interactions,
- First trimester of pregnancy when the patient so elects.

There are no studies and no reliable estimate of the number of days, weeks, or months that constitute a clinically important interruption of one or more components of a therapeutic regimen that would increase the likelihood of drug resistance. If there is a need to discontinue any antiretroviral medication for an extended time, clinicians and patients should be advised of the theoretical advantage of stopping all antiretroviral agents simultaneously, rather than continuing one or two agents, to minimize the emergence of resistant viral strains.

Antiretroviral therapy should be stopped and or changed when there is evidence of:

- Toxicity or intolerance to one or all drugs
- Failure as evidenced by the patient becoming symptomatic and progressive decline of CD4+ count and/or rise of viral load despite good adherence to antiretroviral treatment.

When changing treatment the following should be observed:

- Never change a single drug in the combination if the cause of changing is treatment failure, but rather change at least two of the drugs.

- If changing due to toxicity, change only the drug suspected to be causing the problem.
- Never change to a single drug therapy
- In selecting drugs choose drugs that have not been used before, drugs that do not have cross-resistance, and have no overlapping toxicities or drug-drug interactions.

### 12.6.1 Changing Antiretroviral therapy because of treatment failure

Treatment failure can be defined as virologic, immunologic and/or clinical. Treatment failure results from failure to suppress viral replication with the development of viral resistance. Primary virologic failure is less than 10 fold drop in viral load after 6-8 weeks of therapy. Secondary virologic failure is 10 fold increase from lowest recorded level. Immunologic failure is defined as a 30% drop in CD4+ count from peak value or a return to pre-ART baseline or lower. Clinical failure is progression of disease with the development of opportunistic infections or malignancy occurring 3 months or more after initiation of ART.

In Tanzania, immunological and clinical parameters will be used to identify failure. However, in light of dropping costs of performing viral load measurements, along with simplification of the processes, where available, viral load parameters should also be applied.

Clinical failure must be distinguished from Immune Reconstitution Syndrome. A favourable CD4+ T-cell response can occur with incomplete viral load suppression and might not indicate an unfavourable prognosis. Continuation of existing therapy does not lead to rapid accumulation of drug-resistant virus in every patient. A reasonable strategy is maintenance of the regimen, with redoubled efforts at optimising adherence and increased monitoring. If it is determined that a patient should switch regimens due to treatment failure, there should be a switch from their first-line combination to a completely new standardized second-line regimen.

### 12.6.2 Changing Antiretroviral therapy because of toxicity

The general clinical recommendation is that when changing a patient's regimen due to toxicity, only the toxic drug(s) should be replaced, if possible. The first line of the National ART Program includes the following ARV drug combinations with some common toxicity switches.

**Table 16: Common toxicity switches for First line drugs**

First Line Regimen	Problem	Substitution
d4t + 3TC + NVP	Hypersensitivity due to NVP	d4T + 3TC + EFV*
d4t + 3TC + NVP or EFV*	Severe peripheral neuropathy due to d4T	AZT + 3TC + NVP or EFV*
AZT + 3TC + NVP or EFV*	Anemia due to AZT	d4T + 3TC + NVP or EFV*
d4T + 3TC + NVP or EFV*	Intolerant to NVP and EFV	D4T + 3TC + LPV/rtv**

\* Only if patient is older than 3 years of age and a woman with no risk of pregnancy.

\*\* Follow up liver function tests (LFTs) closely.

**Side effects or toxicities caused by ARVs can be classified into three broad categories:**

**First category:** Symptoms are mild and transient which often require patient assurance that these symptoms are common and will decrease over time. ARV interruption is seldom indicated in this situation. These can be mild headaches, mild gastric upset, nausea, fatigue and the CNS disturbances seen with EFV.

**Second category:** Symptoms are somewhat more severe and often respond to some medical intervention. These include more severe gastric upset with nausea and vomiting, more severe headaches and mild peripheral neuropathy (not incapacitating or interfering with lifestyle). These symptoms can often be successfully treated with anti-emetics, anti-diarrhoea medicines, analgesics, neuroleptics (amitriptylene) and other medicines. ARV interruption is usually not indicated in this situation and often symptomatic treatment is only temporary. The mild rash associated with NVP will be considered under a separate paragraph below but can often be treated with medical intervention.

**Third category:** Severe symptoms in which an ARV drug must be stopped and replaced by an alternative drug. These include anemia (hemoglobin < 7.5 gm/dl or a falling haemoglobin, often that drops by 2 gm/dl) as can occur with the use of AZT. Severe symptoms noted in the first two categories can sometimes lead to the stopping of ARV due to severe toxicities such as nausea with severe discomfort and minimal intake for 3 or more days, vomiting all intake in 24 hours or dehydration due to vomiting, severe headache not responsive to non-narcotic analgesics, or fatigue reducing activity by more than 50%. In these situations, one or more ARVs are replaced by another.

This also includes the hypersensitivity reaction to NVP which can include a severe rash or liver function test (LFT) elevations to grade III or > 5 times the upper limit of normal range.

***Nevirapine (NVP) hypersensitivity reactions***

NVP hypersensitivity reactions can manifest as a rash and/or elevated LFTs. The rash can occur in up to 20 % of patients and usually occurs in the first 6-8 weeks of therapy. NVP will be initiated at a lower dose for the first 2 weeks when only one NVP dose is given per day for 14 days. If there are no clinical signs or symptoms of a NVP hypersensitivity or allergy, the LFT (ALAT) will be checked and the NVP dose will be escalated to 2 doses per day starting at the week 2 visit.

There are commonly two levels of severity in NVP-induced rashes.

**Mild Nevirapine (NVP) hypersensitivity reaction:**

A mild rash is defined as erythema, urticaria, intact skin, no blistering or sloughing of skin or desquamation, no involvement of mucous membranes, no angioedema, and no systemic signs (body aches, arthralgias, myalgias, fevers, lymphadenopathy or significantly elevated LFTs). If a mild drug-reaction type rash occurs, patients will continue treatment with caution and careful monitoring. LFTs that are less than grade III (<5 times the upper limit of normal) can usually be followed to resolution. This rash will be treated with patient assurance, antihistamines and close follow up until resolved. NVP dose escalation will be deferred for up to one week until symptoms resolve. If symptoms worsen, this may indicate that the patient has severe hypersensitivity reaction and NVP will need to be stopped immediately and other medical interventions considered, as noted in the next paragraph.

## **Severe Nevirapine (NVP) hypersensitivity reaction (Stevens-Johnson Syndrome, SJS):**

A severe rash is defined as severe erythema, urticaria, desquamation of skin (moist), skin blistering, sloughing of skin, exfoliative dermatitis, erythema multiforme (when severe and involving the mucous membranes is known as SJS), anaphylaxis, involvement of mucous membranes, angioedema, cracked/fissured lips, or systemic signs (body aches, arthralgias, myalgias, fevers, lymphadenopathy or significantly elevated LFTs). If a severe drug-reaction type rash occurs, patients will discontinue NVP treatment, begin high dose prednisolone, antihistamines, analgesics, and be admitted to the hospital for IV fluids and careful monitoring, LFTs can be grade III (>5 times the upper limit of normal) or higher. NVP will be stopped immediately and not re-introduced. All ARVs will be stopped. Once the patient recovers, 3 ARV drugs will be started that do not include NVP. The remaining 2 ARVs will be paired with a replacement ARV such as EFV, if not contraindicated.

### ***Abacavir (ABC) hypersensitivity***

ABC hypersensitivity occurs in 3-5% of patients and can be fatal. Hypersensitivity symptoms include: flu symptoms, shortness of breath, cough, fever, achiness, generally ill feeling, fatigue/tiredness, swelling, abdominal pain, diarrhea, nausea, muscle or joint aches, numbness, sore throat or rash. ABC will be stopped immediately and not re-started if this occurs. If there is a history of ABC hypersensitivity, then ABC is contraindicated.

### ***Efavirenz (EFV) Side effects***

EFV can cause CNS side effects such as vivid dreams, nightmares, vertigo, or confusion. These symptoms are often mild and transient. Patients may benefit from assurance that these symptoms are common and will decrease over time.

### ***Stavudine (D4T) Side effects***

Peripheral Neuropathy is a common side effect and occurrence of lactic acidosis has been reported and need to be carefully monitored.

## **12.7 Second-Line ARV Regimen**

Before treatment failure is presumed and a particular regimen discarded, every effort should be made to rule out causes other than drug resistance. Patients should be evaluated for correctable factors, such as:

- Inappropriate dosing schedules,
- Drug interactions that may reduce the efficacy of some of the ARV drugs,
- Non adherence due to side effects,
- Evidence of malabsorption.

Each of the above scenarios could result in sub-therapeutic drug levels and poor clinical response. In such cases, the regimen in question may be salvaged with palliative medication and/or patient education. If clinical assessment indicates the presence of treatment failure due to confirmed drug resistance, then the

best approach is to switch to an entirely new regimen, choosing two or more drugs to which the patient is naïve as the second line drug regimen. Before changing to the second line drug regimen, the patient should go through the treatment readiness and education process again. This would need to be carefully monitored as some patients might hide their non-adherence.

## **Second-line antiretroviral therapy in adults and adolescents**

The second line regimen for adults and adolescents includes the following drug combinations:

- Abacavir 300 mg twice daily/Lopinavir/ritonavir 133.3/33.3 mg (Kaletra) 3 tablets twice a day and didanosine 200 mg. two tablets a day on an empty stomach
- Note: ddl is easier to dose at 250-300 mg od for wt < 60 kg and 400 mg od for body wt > 60 kg.
- Alternatively the following regimen can also be used:
- Abacavir (ABC) 300 mg twice daily/ /Saquinavir/ritonavir (SQV 5X 200 mg or 1000 mg bd plus RTV one 100 mg cap bd) and didanosine 200 mg. two tablets a day

Note: ddl is easier to dose at 250-300 mg od for wt < 60 kg and 400 mg od for body wt > 60 kg.

### **12.8 Monitoring Patients on ARV Therapy.**

In Tanzania, CD4+ T-lymphocyte count is the gold standard method used to determine the time for initiation and change of therapy. Each patient should have a baseline CD4+ T-lymphocyte count (and viral load where possible) done before initiating treatment. CD4+ T-lymphocyte count should then be repeated at least every 6 months. Treatment will in most cases be associated with weight gain and reduced morbidity from opportunistic infections and improvement in the quality of life. Appearance or persisting opportunistic infections, or lack of weight gain, may indicate treatment failure and so the need to consider changing regimens.

Treatment is to be considered successful if the viral load decreases by 1 to 2 logs (10 to 100 folds) from the baseline level. However in most cases, CD4+ will be used instead of viral load thus a rise in CD4+ T-lymphocyte count will indicate success.

Treatment failure on the other hand is indicated by a viral load increase of 0.3 to 0.5 logs or a 30% fall in CD4+ T-lymphocyte count.

#### **12.8.1 Clinical and laboratory monitoring of patients on first line drug ARV regimen**

##### **Scheduled visits**

Patients will attend the clinic monthly to collect medication and be seen by the professional nurse, Clinical Officer or Assistant Medical Officer to monitor drug tolerance, adverse events and adherence. Ideally the clinic nurse, doctor, pharmacist or therapeutic counsellor should count drugs at each scheduled visit. All patients should be seen by the physician at 2 weeks after initiation to check for adverse events, do more blood tests (ALT or FBC) and to escalate the NVP dose. Patients should be seen by the doctor at 4, 8 and 12 weeks and 3-monthly thereafter if well. If not well, patients would need to be seen more frequently as determined by the treating doctor or nurse. Safety bloods are to be taken as per schedule. CD4 count will be done 6-monthly while patients are on the first line regimen.

**Table 17: Time events schedule**

Assessment	Week 0 (baseline)	2 <sup>nd</sup> Week	4 <sup>th</sup> Week	8 <sup>th</sup> Week	12 <sup>th</sup> Week	Every month	Every 3 months	Every 6 months
Education/therapeutic counsellor visit	N, C		N, C	N, C	N, C	N, C	N, C	
Treatment readiness assessment	Whole team							
History	D							
Physical exam	D		D	D	D	N	N	N
Weight	N		N	N	N			N
Complete registers	N, C					N, C	N, C	N, C
Safety blood tests (regimen I and II with NVP <sup>a</sup> )	N	N <sup>a</sup>	N <sup>a</sup>	N <sup>a</sup>				N <sup>a</sup>
Safety blood tests (regimen II and IV with AZT <sup>a</sup> )	N		N	N	N <sup>b</sup>			N <sup>b</sup>
CD4 count	N							N
Adverse events		N, P	D, P	D, P	D, P	N, P		
Adherence check <sup>c</sup>	N, C	P, N, C	P, N, C, D	P, N, C, D	P, N, C, D	P, N, C, D		

- a. For patients on NVP containing regimens (I and II) ALT will be taken at baseline, week 2, 4 and 8 then 6 monthly. Additional safety bloods will be required in pregnancy.
- b. For patients on regimen II and IV i.e., AZT containing, FBC will be done monthly for 3 months, then 6 monthly. Fasting cholesterol, triglycerides and fasting glucose will be done as in table 3.2.
- c. Calculate monthly adherence = (tablets dispensed – tablets returned)/(tablets prescribed), e.g. (30 – 5)/28 = 25/28 = 0.9 (90%).

Key: C=counsellor, D=doctor, N=nurse, P=pharmacist

**Table 18: Summary of Adult ART Laboratory monitoring of patients on first line regimen**

Regimens	Monitoring Tests	Frequency	Rationale
I. d4T/3TC/NVP	CD4+	Staging, 6-monthly	ART monitoring
	ALT	Baseline, week 2, 4 and 8, thereafter 6 monthly	Contains NVP
II. AZT/3TC/NVP	CD4+	Staging, 6-monthly	Contains NVP and AZT
	ALT	Baseline, week 2, 4 and 8, thereafter 6 monthly and whenever symptomatic	
	FBP	Baseline, week 4 and 8, thereafter, 6 monthly	Contains AZT
III. d4T/3TC/EFV	CD4+	Staging, 6-monthly	ART monitoring
	ALT	6-monthly or Symptomatic	Contains EFV
IV. AZT/3TC/EFV	CD4+	Staging, 6-monthly	ART monitoring
	ALT	6-monthly or Symptomatic	Contains AZT
	FBP	Baseline, week 4 and 8, thereafter, 6 monthly	Contains EFV

**Staging** = initial testing for all HIV +ve persons to determine if actual need for antiretroviral therapy (ART) and during ART to determine if need for change of ART

**Baseline** = testing at initiation of ART to monitor drug toxicity

## Unscheduled visits

Beyond the scheduled visits, it is also important for the patients to be counselled to present themselves to the CTC should they develop any unexpected symptoms and complications. Clinical judgement will be used to assess whether additional clinical or laboratory interventions are required.

## Immune Reconstitution Syndrome

Patients with advanced HIV disease, particularly those with a CD4+ count of less than 50 cells/mm<sup>3</sup> may become ill with an immune reconstitution illness during the first few weeks of antiretroviral therapy with symptoms of fever, sweats, loss of weight, cough etc., Tuberculosis is a common immune reconstitution illness.

Immune reconstitution illnesses occur when improving immune function unmasks a previously occult opportunistic infection (an infection that was present in the patient's body, but was not clinically evident). It is not indicative of drug failure or drug side effects, thus is not a reason to stop ART, or change the regimen. Opportunistic infections may present in atypical ways during this phase of immune reconstitution. Patients therefore need to be referred to the CTC of the district, regional or referral hospital for advice regarding investigation and management.

## 12.9 Laboratory Monitoring of patients on second line drugs

### 12.9.1 Scheduled visits

Patients started on a second regimen need to come to the clinic every month for the first 3 months to see the doctor and thereafter 6 monthly or as required. Drugs need to be collected every month.

**Table 19: Summary of Adult ART Second line Regimen and routine monitoring**

Regimen	Drugs	Monitoring Tests/ Frequency
Second (2 <sup>nd</sup> ) line	ABC / ddI / lopinavir / ritonavir	CD4+, Baseline, 6-monthly FBC, Baseline, then monthly for 3 months, then 6 monthly (with CD4 + and viral load) Fasting cholesterol and triglyceride, Baseline, 6 months and thereafter every 12 months Liver function tests, (ALT) 6 monthly Fasting glucose, Every 12 months

**Staging =** initial testing for all HIV +ve persons to determine if actual need for antiretroviral therapy (ART) and during ART to determine if need for change of ART

**Baseline =** testing at initiation of ART to monitor drug toxicity

## **12.9.2 Unscheduled visits**

Clinical judgement will be used to assess whether additional clinical or laboratory interventions are required.

## **12.10 Treatment failure with second line regimen**

Patients on second-line therapy who begin to fail on the basis of clinical, immunological, or virological parameters should receive increased adherence support, as described above.

If they continue to fail virologically, despite demonstrated increased adherence, their ART should be continued until they cease to derive clinical benefit from the treatment. Where adherence is consistently <80% ongoing education and counselling is required.

If the patient experiences an AIDS defining (WHO stage 4) illness on second-line therapy, expert opinion should be sought regarding stopping antiretroviral therapy, and instituting palliative care.

### **12.10.1 In case of loss to follow up**

Aggressive follow up is needed by clinic team members in collaboration with home based caregivers to follow up any patients who do not fulfil their scheduled visit. System triggers for this are critical to institute and maintain throughout follow-up. A good referral mechanism should therefore be established between the clinic and other levels of health care delivery, as well as home based care teams.

## **12.11 Contraindications (relative) for initiation of ART**

Antiretroviral drugs should be avoided or deferred in the following conditions:

- If compliance is not assured
- If the patient refuses to give consent
- In the first trimester of pregnancy
- Liver or renal failure

## **12.12 Discontinuation of ART**

ART should be discontinued only on advice from specialists. The only exceptions are cases where:

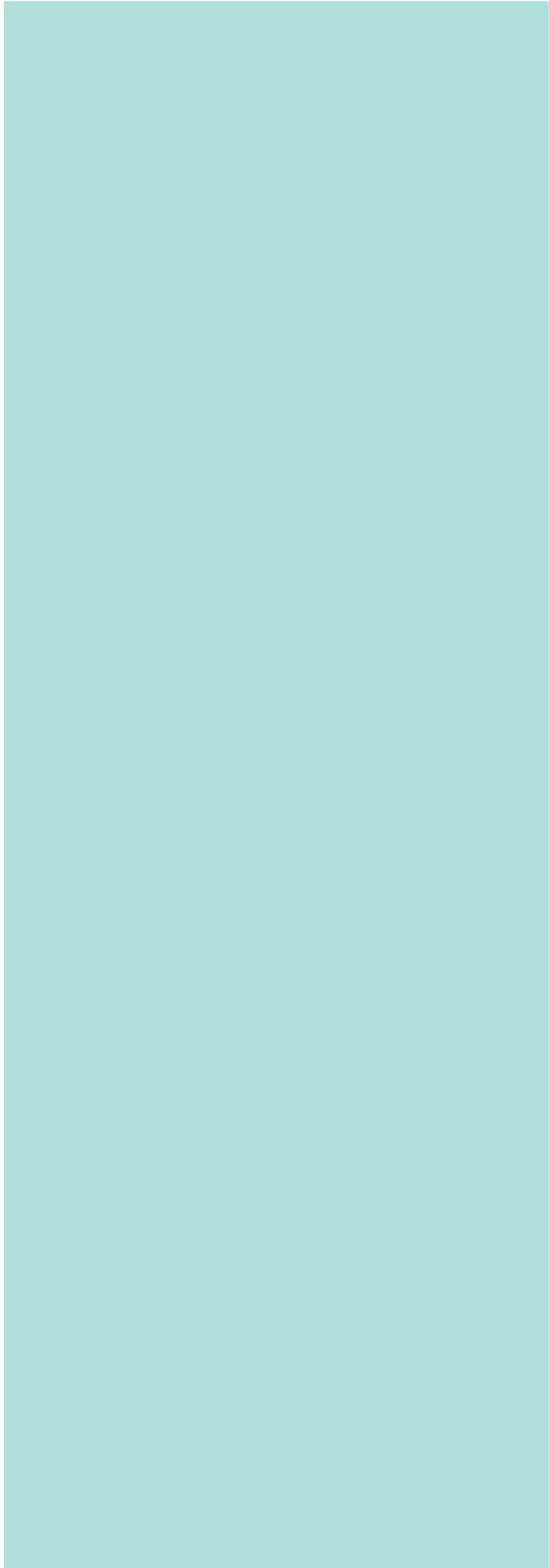
- The patient is dying and can no longer comply
- Repeated failure to comply with treatment
- Cases of severe toxicity





## **Chapter 13**

# ARV Therapy in Infants and Children



### 13.1 Antiretroviral regimens for HIV infected children

Most children acquire infection through prenatal exposure. Determination of HIV infection in children below 18 months poses special diagnostic challenges. The pathogenesis of HIV infection and the general virologic and immunologic principles underlying the use of ART are similar for all HIV-infected persons. However, when prescribing ART in children, the following considerations should be made:

- Possible in utero exposure to ARV drugs.
- Differences in immunologic markers (e.g. CD4+ T-lymphocyte count, viral load, antibody levels) among children of different age groups.
- Changes in pharmacokinetic parameters with age caused by the continuing development and maturation of organ systems involved in drug metabolism and clearance.
- Differences in the clinical, virologic and immunological parameters between children and adults and among children of different age groups.
- Adherence to treatment for children is influenced by parents/guardians.

All antiretroviral drugs approved for treatment of HIV infection may be used for children when indicated. However, for young children requiring syrup or liquid formulations, ART prescriptions may be limited to those available in these formulations. Furthermore, pharmacokinetic parameters in children vary with age and therefore are more complicated than in adults.

### 13.2 Goals of Antiretroviral Therapy in children

The goals of antiretroviral therapy for children are to:

- Prolong the survival of HIV-infected children
- Promote optimal growth and development
- Preserve, enhance, or reconstitute the immune system and therefore reduce opportunistic infections
- Suppress HIV replication and therefore prevent disease progression
- Reduce the morbidity of children and improve their quality of life
- The child's CD4+ count and/or CD4+ percentage should rise and remain above the baseline count.
- Achieve undetectable (<400 copies/mL) viral load and remain so while on ART.

### 13.3 Selection of Patients for Antiretroviral Therapy

#### Criteria for commencing antiretroviral therapy in children

There are difficulties in making a laboratory diagnosis of HIV infection in infants aged <18 months. This is due to persistence of maternal antibody thus requiring virologic tests to make definitive diagnosis of HIV infection in this age group. The recommendations for initiation of ARV therapy in children are therefore divided into categories related to age and availability of virologic diagnostic tests. When CD4+ cell assays are available, use of CD4+ cell percentage is recommended for children for decision-making on ARV treatment rather than absolute CD4+ cell count because it varies less with age. The availability of virologic testing is desirable, but not absolutely necessary to the development of recommendations for the initiation of therapy in young infants.

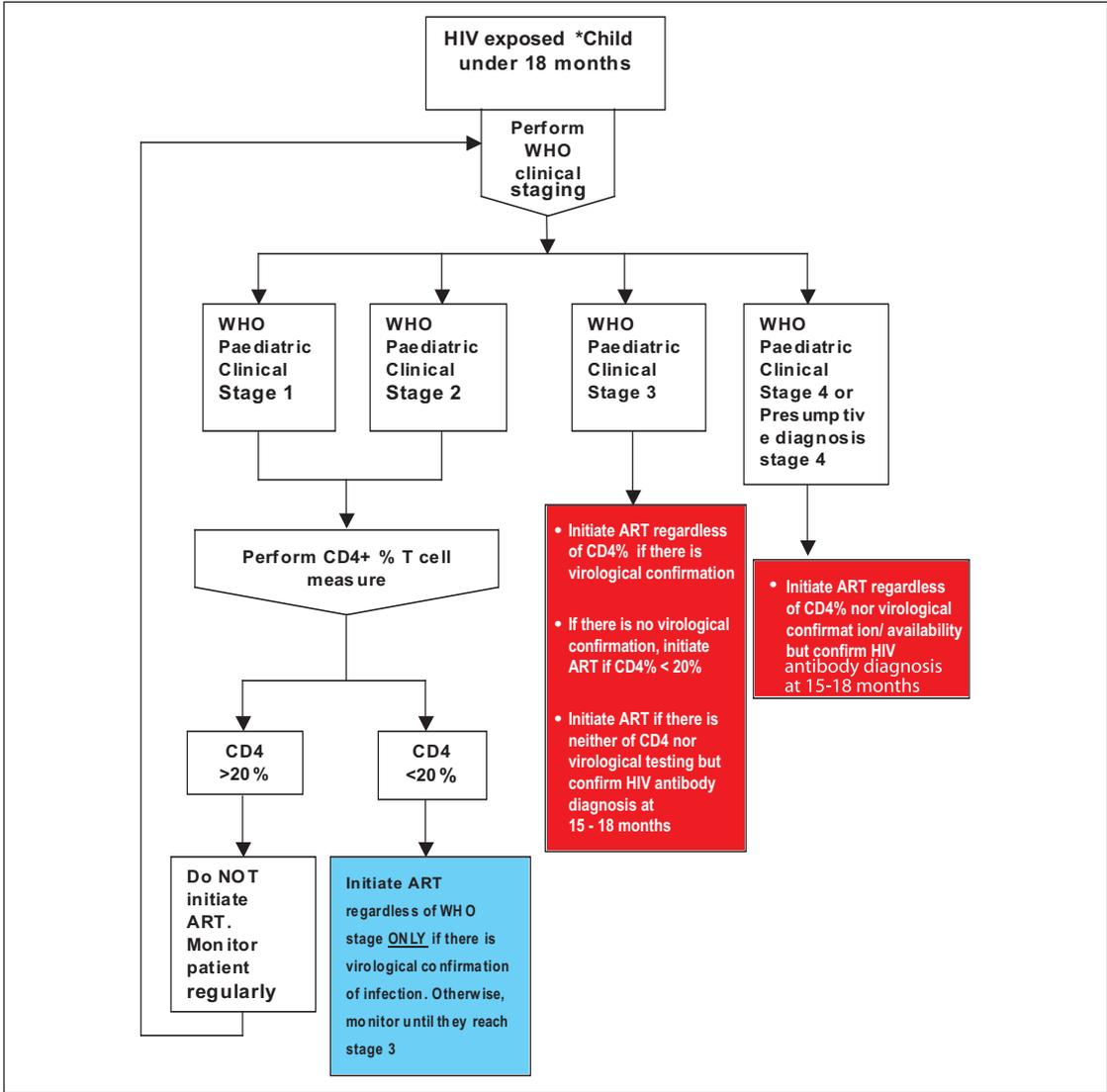
For WHO Paediatric clinical staging see table 9.1 and 9.2

### Initiation of Treatment for Infants under 18 months

For HIV-sero-positive infants aged <18 months, initiation of ARV therapy is recommended in:

- Infants with WHO Stage 3 or 4 disease and CD4 percentage <20% in absence of virological confirmation of diagnosis.
- Infant with virologically-proven infection (using HIV DNA PCR, HIV RNA assay, or immune-complex dissociated p24 antigen) and has WHO Paediatric Stage 3 (e.g., clinical AIDS) irrespective of CD4%.
- Infant is in WHO Paediatric Stage 1 or 2 disease with CD4 <20%, and virological confirmation
- Infants < 18 months with neither virological confirmation nor CD4 percent available, with WHO Paediatric Stage 3 or 4. In such cases, HIV antibody testing must be repeated at age 18 months to definitively confirm that the child is HIV infected; only children with confirmed infection should have ARV therapy continued.

Figure 7: Clinical Eligibility Criteria for ART in Children under 18 months



\* HIV exposed child is one who is antibody positive according to national protocol and not confirmed to actually be infected

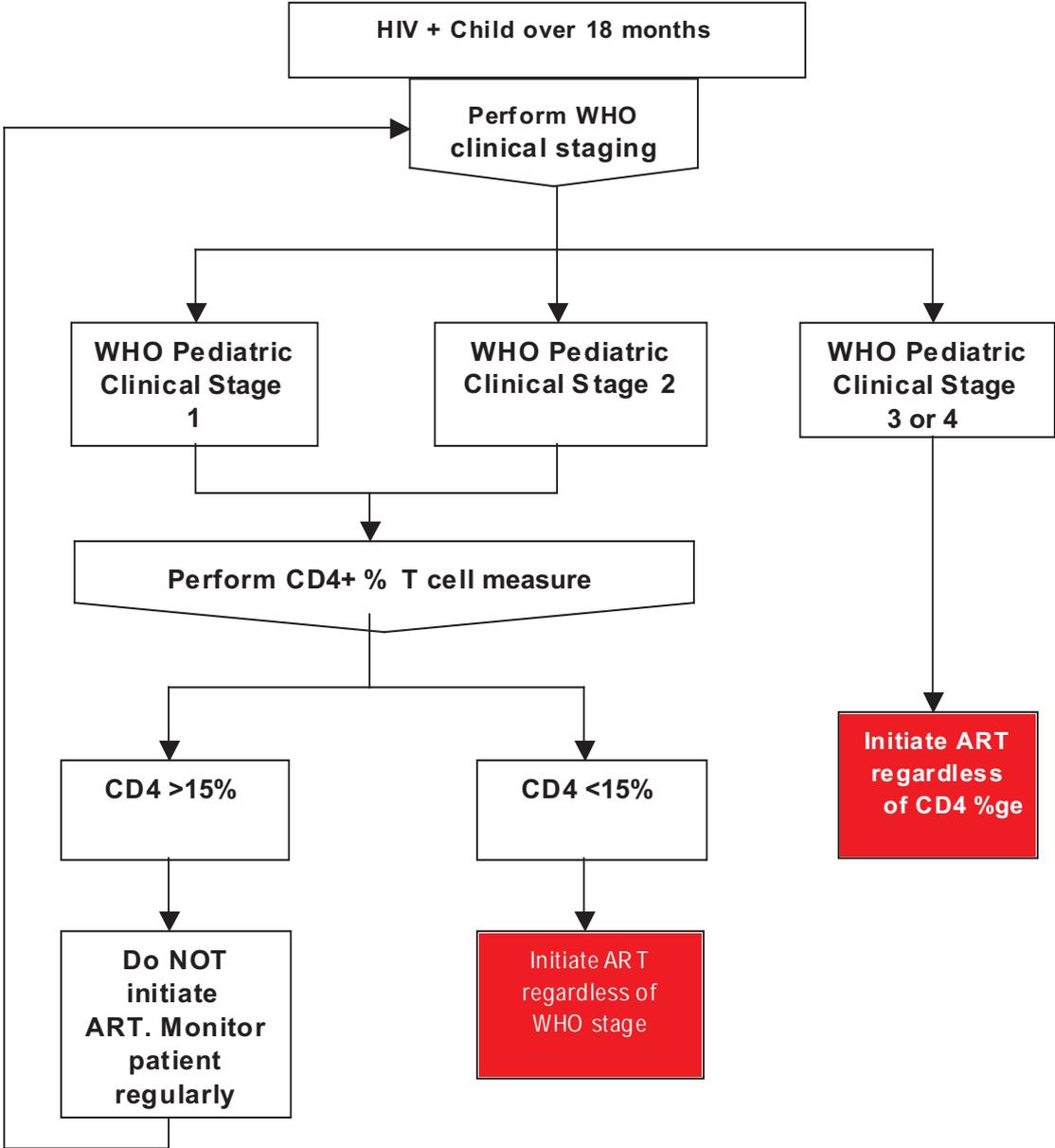
### Initiation of treatment for Children over 18 months

For children over 18 months of age, a positive antibody test is an indication of HIV infection since any acquired antibodies from the mother would have degenerated, and breastfeeding has typically stopped. Initiation of ART is therefore recommended if:

- WHO Paediatric Stage 3 or 4 HIV disease, irrespective of CD4 %; or
- WHO Paediatric Stage 1 or 2 disease and CD4 <15%

All children in stage 3 could be started on ARV therapy even if a CD4 percent is not available, but attempt should be made to do a CD4 percent as soon as possible for monitoring. In the interim the child should be monitored clinically. When in doubt, the attending clinician should consult or refer the child.

**Figure 8: Clinical Eligibility Criteria for ART in Children over 18 months**



The penetration of ARVs into human breast milk in lactating women has not been quantified for most ARVs. Although some ARVs, such as Nevirapine, are known to be present in breast milk, the concentration and quantity of drug that would be ingested by the infant would be less than needed to achieve therapeutic levels. Thus, if a breastfeeding infant is ill enough to require ARV treatment ARVs at standard pediatric doses should be initiated regardless of whether the mother is receiving ARV therapy or not. Infected breastfeeding infants whose mothers are receiving ARV therapy may ingest sub-therapeutic levels of some ARVs, and this could lead to development of drug resistance in the infant's virus. ARVs should not be administered during the breastfeeding period to infants with documented HIV infection who do not require ARV therapy themselves. Further research is needed to address whether administration of drugs to infants may decrease resistance or alter response to therapy.

### **13.4 Recommended First-Line ARV Regimens in Infants and Children**

Drug doses must be adjusted as the child grows, or there is a risk of under dosage, development of resistance and sub optimal response; therefore, dosing in children is based on either body surface area or weight. Standardization is important so that non-expert personnel can safely dispense correct doses, and it is therefore desirable to provide health care workers with a table of drug doses that can be administered according to weight bands.

Some ARVs available for adults are also available for children with specific child formulations. However, formulations appropriate for use by young children who cannot swallow whole tablets or capsules are not currently widely available. Many drugs do not have solid formulations in doses appropriate for pediatric use and some solid formulations do not have all drugs components evenly distributed in the tablets (e.g., fixed dose AZT/3TC). Use of tablets that require cutting up, particularly unscored tablets, can result under dosing or overdosing of the drug in the child, which can lead to an increased risk of resistance or toxicity. The national programme shall therefore strive to provide the widest range possible of dosing options for children to mitigate risks of under- and over- dosing.

The preferred first line treatment option for children are:

- For children under 3 years old: AZT+3TC+NVP
- For children 3 years old or more: AZT+3TC+EFV or NVP

d4T is an alternate for AZT in cases of anaemia (Hb<7.5g/dl). It should be noted though that d4T in liquid formulation needs refrigeration, and potential side effects such as peripheral neuropathy are difficult to recognise in children

If a mother has received ARV during pregnancy, either to reduce mother to child HIV transmission (MTCT) or for her own disease, there is a possibility that she may transmit resistant virus to her baby if the baby becomes infected. Additionally, resistance could be induced de novo in the infant if the infected infant is exposed to an antiretroviral drug being used for prophylaxis before the infant infection status is known. This is a particular problem if NVP or 3TC have been used, either alone or as a component of a two-drug regimen, for prophylaxis of MTCT. It is unknown whether ARV choices should be modified for infants who have been exposed to ARVs used for prevention of MTCT. Children who require ARV therapy and who have previously received either single-dose NVP or 3TC as part of preventive prophylaxis for MTCT should be considered eligible for NNRTI-based regimens.

## 13.5 Clinical Assessment of Infants and Children Receiving ARV Therapy

Important clinical signs of response to ARV therapy in children include:

- improvement in growth in children who are failing to grow
- improvement in neurological symptoms and development in children who are demonstrating delay in developmental milestones or encephalopathy
- and/or decreased frequency of infections (bacterial infections, oral thrush, and/or other opportunistic infections).

Laboratory assessments in children on ARV therapy are the same as recommended in adults. In addition to the clinical assessments recommended in adults, clinical monitoring of ARV treatment in children should include:

- Nutrition and nutritional status
- Weight and height growth, and head circumference for children under 3 years old.
- Developmental milestones
- Neurologic symptoms

## 13.6 Reasons for Changing ARV Therapy in Infants and Children

The principles on which to base changes in therapy for children are similar to those applied to adults, and management of drug toxicity is the same when toxicity is related to an identifiable drug in the regimen, the offending drug can be replaced with another drug that does not have the same side effects

### 13.6.1 Clinical Conditions

Clinical conditions indicating that a change to second-line therapy is warranted include:

- Lack of growth response or decline in growth over a 6-months period, after excluding other causes, including TB.
- Delayed (not achieving) neurodevelopmental milestones
- Development of HIV encephalopathy in a child with no previous manifestations
- Recurrence of infections, such as oral candidiasis, that are refractory to treatment
- Advancement from one clinical stage to another or new evidence of stage 3 disease

Note: Short intercurrent episodes of pneumonia, Lower Respiratory Tract Infections (LRTIs) and gastroenteritis should not be regarded as clinical failure. TB can present as a progression to stage 3 disease and must first be excluded.

### 13.6.2 Immunological Conditions

Immunological conditions indicating that a change to second-line therapy is warranted include:

- Persistent decline in CD4+ percent over 2 months in absence of TB
- Rapid and substantial decrease in absolute CD4+ count (i.e. > 30% decline in < 6 months)
- Return of CD4+ percent to or below pre-therapy baseline

**Note:**

- CD4+ percent should not be measured during an intercurrent infection; preferably it should be

determined 1 month (or more) post-resolution.

- If there is a modest decline in CD4+ percent (< 5%) and if there is no failure to thrive, do not change medication, but maintain close monitoring.
- Despite a good clinical and immunological response, viral resistance will occur in the absence of complete viral suppression. Many experts will delay changing therapy unless there are signs of clinical or immunological progression.

### 13.6.3 Virological Conditions

Virological conditions indicating that a change to second-line therapy is warranted include:

- Persistently elevated viral load in the absence of poor adherence to medication
- Progressive increase in viral load after the beginning of treatment (changes greater than 5-fold (0.7 log) in children less than 2 years of age, and of at least 3-fold (0.5 log) in children 2 years of age or older
- < 1.0 log reduction in relation to the initial level after 24 weeks
- Repeated viral load detection in children with earlier undetectable levels.

Before an ARV regimen is thought to be failing based on clinical criteria, the child should have had a reasonable trial on the ARV therapy (e.g., have received the regimen for at least 6 months).

Because of age-related declines in CD4+ absolute cell count through age 6 years, when near-adult levels are reached, it is difficult to use absolute CD4+ cell count to assess failure of therapy in younger children. However, for children aged 6 years or more, similar CD4+ cell count criteria as used in adults is appropriate. Because CD4+ cell percentage varies less with age, it can be used to gauge treatment response regardless of age. Data on use of total lymphocyte count to evaluate response to ARV therapy are not available.

## 13.7 Recommended Second-Line ARV Therapy for Infants and Children

Second-line therapy for children in the event of first-line regimen failure would include a change in nucleoside backbone based on the same principles as for adults. Use of protease inhibitors other than LPV/r and NFV is more problematic in children due to lack of suitable pediatric drug formulations for IDV and SQV and lack of appropriate dosing information for ritonavir-boosted PIs other than LPV/r. However, use of SQV/r can be considered as an alternative for children who can swallow capsules and are >25 kg weight and can therefore receive the adult dosage.

The recommended second line regimen for infants and children who have failed their first line is therefore:

- Didanosine (ddI)+Abacavir (ABC)+ Ritonavir boosted Lopinavir(LPV/r)
- However given the bitter taste of LPV/r, children sometimes refuse it based on taste. **Nelfinavir (NFV)** should therefore be considered as the substitute for LPV/r

**Table 20: Antiretroviral Drugs in Paediatric Practice**

Drug	Formulation	Dosage	Adverse Events	Comments
<b>Nucleoside Reverse Transcriptase Inhibitors (NRTIs)</b>				
<b>Zidovudine AZT, ZDV</b>	Suspension 1mg/ml Capsules 100mg 250mg Tablets 300mg	180 mg/m <sup>2</sup> bd or 90-180mg/m <sup>2</sup> tds Neonatal dose 2mg/kg qid	Neutropenia anemia headache myopathy lactic acidosis (rare)	Can be given with food Store at room temperature
<b>Lamivudine 3TC</b>	Suspension 10mg/ml Tablets 150mg	4mg/kg bd Neonatal dose 2mg/kg bd	Headache abdominal pain fatigue pancreatitis peripheral neuropathy neutropenia - LFTs lactic acidosis (rare)	Can be given with food Store at room temperature
<b>Stavudine d4T</b>	Suspension 1mg/ml Capsules 20mg 30mg 40mg	1mg/kg bd	Headache GI upset rash peripheral neuropathy - LFTs pancreatitis lactic acidosis	Can be given with food Keep suspension refrigerated
<b>Didanosine ddI</b>	Suspension 10mg/ml Tablets 25mg 50mg 100mg 150mg	90-120 mg/m <sup>2</sup> bd	Diarrhoea abdominal pain nausea peripheral neuropathy pancreatitis lactic acidosis	Give on empty stomach Keep suspension refrigerated
<b>Abacavir ABC</b>	Suspension 20mg/ml Tablets 300mg	8mg/kg bd	Hypersensitivity rash (5%) fever malaise mucositis pancreatitis lactic acidosis	Can be given with food Store at room temperature <i>Do not rechallenge after hyper-sensitivity</i>
<b>Non-nucleoside Reverse Transcriptase Inhibitors (NNRTIs)</b>				
<b>Nevirapine NVP</b>	Suspension 10mg/ml Tablets 200mg	Start with 120 mg/m <sup>2</sup> once daily for 14 days increase to full dose (120-200 mg/m <sup>2</sup> ) every 12 hrs (maximum 200mg every 12 hrs) if no rash or severe adverse events	Rashes Stevens-Johnson Syndrome - LFTs hypersensitivity and hepatitis	Can be given with food Store at room temperature <i>Watch for liver toxicity</i>
<b>Efavirenz EFV</b>	Capsules 50mg 200mg	Single daily dose 10-15 kg 200mg 15-20 kg 250mg 20-25 kg 300mg 25-32.5 kg 350mg >40 kg 600mg	Rash (mild) somnolence abnormal dreams insomnia confusion hallucinations euphoria amnesia agitation abnormal thinking	Can be given with food Administer at night Store at room temperature of age No pharmacokinetic data <10kg and <3 years
<b>Protease Inhibitors (PIs)</b>				
<b>Ritonavir RTV</b>	Suspension 80mg/ml Capsules 100mg	initial dose of 250 mg/m <sup>2</sup> bd increase by 50 mg/m <sup>2</sup> bd at 2-3 day intervals to 400 mg/m <sup>2</sup> bd f <2 yrs of age maximum dose 450 mg/m <sup>2</sup> bd	GI intolerance headache anorexia - LFTs abnormal lipids (rare)	Give with food Palatability improved by mixing with milk honey ice cream yogurt or chocolate milk shake Store in refrigerator or room temperature

Drug	Formulation	Dosage	Adverse Events	Comments
<b>Nelfinavir</b> <b>NFV</b>	Suspension 80mg/ml Tablets 250mg	Paediatric 55 mg/kg bd Adolescent 750mg tds or 1250 mg bd	Diarrhoea vomiting rash abnormal lipids exacerbation of chronic liver disease (rare)	Administer with food Suspension may be mixed with water milk pudding ice cream formula
<b>Lopinavir/ritonavir</b> <b>LPV/RTV, Kaletra</b>	Suspension 80mg LPV and 20mg RTV per ml Capsules 133.3 mg LPV and 33.3 mg RTV of 400mg bd	230 mg/m <sup>2</sup> LPV/57.5 mg/m <sup>2</sup> bd RTV bd up to a maximum of 400mg LPV/ 100mg RTV bd Refrigerate suspension or keep at room increase dose with NVP or EFV co-administration	G intolerance rash headache abnormal lipids hyperglycaemia pancreatitis (rare)	Give with food A high fat meal increases absorption temperature for 2 months
Fixed drug combinations				
D4T/3TC/NVP (Triomune)	Tablet 40mg/150mg/200mg or 30mg/150mg/200mg	1 tablet twice daily depending on child's weight		Tablet broken up as per weight of child Attainment of accurate dosage difficult with breakage of tablet Preferably tablets should not be split/broken





## **Chapter 14**

# Use of ARV in Special Circumstances

### 14.1 People with tuberculosis disease and HIV co-infection

Antiretroviral therapy is recommended for all patients with TB with a CD4+ count <200 cells/mm<sup>3</sup> and should be considered for TB patients with CD4+ <350 cells/mm<sup>3</sup>. Treatment of TB remains a central priority for patient management and should not be compromised by ART. On the other hand, case fatality rates in many patients with TB during the first two months of TB treatment are high in particular when they present with advanced HIV disease, and ARV in this setting might be life-saving.

Patients with TB merit special consideration because co-management of HIV and TB is complicated by Rifampicin drug interactions with NNRTIs and PIs, pill burden, adherence and drug toxicity. Taking the available data into account, the first line treatment recommendation for patients with TB and HIV co-infection is (AZT or d4T) + 3TC+ EFV. The 800 mg dose of EFV achieves higher drug levels comparable to those seen in the absence of Rifampicin and thus may reduce the chance of HIV drug resistance, but also can increase the toxicity risk.

SQV/r in combination with the NRTI backbone is an alternative to EFV although resistance is a clear risk with suboptimal adherence. ABC is another alternative to EFV with the advantage of low pill burden, has no interaction with Rifampicin, and has the advantage of being able to be given to children under 3 years of age for whom appropriate EFV dosing information is not yet available.

#### **The following two scenarios summarise the management of patients co-infected with HIV and TB:**

##### **14.1.1 Patient develops tuberculosis while on antiretroviral therapy:**

Antiretroviral therapy should be continued throughout TB treatment, with changes as follows:

- First line drugs: Substitute Nevirapine for Efavirenz. If this is not possible (e.g. intolerant of Efavirenz or significant risk of falling pregnant), Nevirapine may be substituted with Abacavir or Saquinavir/ritonavir.
- Second line drugs: Lopinavir/ritonavir should be changed to Saquinavir/ritonavir (dose: 400/400 mg every 12 hours – 3 extra caps of ritonavir). This should be continued until 2 weeks after completion of TB treatment, when the extra ritonavir can be stopped.

##### **14.1.2 Patient presents with TB before commencing ART:**

- If the patient has a CD4+ count of more than 350 cells/mm<sup>3</sup>, antiretroviral therapy is not yet needed. The need for antiretroviral treatment should be reassessed on completion of TB treatment.
- If the patient has a history of WHO Stage 4 illness and/or a CD4+ count of 200 –350 cells/mm<sup>3</sup>, complete 2 months of TB therapy before commencing ART.
- If the patient has a CD4+ count of less than 200 cells/mm<sup>3</sup> or other serious HIV related illness, make sure that the patient is tolerating TB treatment before initiating ART. Patients in this group should be started on first-line therapy consisting of d4T/3TC/EFV.

**Table 21 Special considerations of ART in TB and HIV co-infected patients**

CD4 > 200 or CD4 > 15%	Treat TB first
CD4 50 - 200 or CD4 5% - 15%	Treat TB first at least for 2 months before ART (but evaluate case-by-case)
CD4 < 50 or CD4 < 5%	Can begin ART as early as 2 weeks after TB treatment initiation

**N.B:**

For patients who are diagnosed to have TB while on ART, should continue with ART while introducing anti-TB drugs. However, if the patient was on Nevirapine (NVP) this should be changed to Efavirenz (EFV)

**14.2 Post Exposure Prophylaxis (PEP)**

The most common mode of exposure to HIV is in the hospital setting where hospital workers are at increased risk of HIV infection through exposure to infectious body fluids through accidents or when safety precautions are not followed. However the other most common method of exposure is through sexual assault.

**14.2.1 Occupational exposure**

Exposure prevention remains the primary strategy for reducing occupational HIV transmission; however, occupational exposures will continue to occur and so the following should be done:

**14.2.2 Treatment of an Exposure Site**

Wounds and skin sites that have been in contact with blood or body fluids should be washed with soap and water; mucous membranes should be flushed with water. No evidence exists that using antiseptics for wound care or expressing fluid by squeezing the wound further reduces the risk of blood borne pathogen transmission; however, the use of antiseptics is not contraindicated. The application of caustic agents (e.g., bleach) or the injection of antiseptics or disinfectants into the wound is not recommended.

**14.2.3 Exposure Report**

If an occupational exposure occurs, the circumstances and post exposure management should be recorded in the exposed person's confidential form for easy follow up and care.

**14.2.4 Evaluation of the Exposed HCW**

Health care worker exposed to HIV should be evaluated within hours (rather than days) after their exposure in order to allow early initiation of PEP. The exposed Health care workers should be counselled and tested for HIV at baseline (i.e., to establish infection status at the time of exposure). In case of refusal to test, PEP should not be started or should be discontinued.

For purposes of considering HIV PEP, the evaluation also should include the following information that might influence drug selection:

- Medications that the exposed person might be taking
- Any current or underlying medical conditions or circumstances (i.e., pregnancy, breast feeding, or renal or hepatic disease).
- Hepatitis B vaccination should be considered after any large volume needle-stick injury.

## 14.2.5 Drugs for PEP for HIV

For most HIV exposures a combination of AZT and 3TC should be used. For exposures that pose an increased risk for transmission see Tables 22, 23(a) and 23(b).

**Table 22: Recommendations for chemoprophylaxis after accidental exposure to HIV**

TYPE OF EXPOSURE	SOURCE OF MATERIAL+	ANTIRETROVIRAL PROPHYLAXIS+	ANTIRETROVIRAL REGIMEN****
Percutaneous	Blood+++		
	Highest risk	Recommend	ZDV plus 3TC plus EFV or NVP
	Increased risk	Recommend	ZDV plus 3TC, +/- EFV or NVP
	No increased risk	Offer	ZDV plus 3TC
	Fluid containing visible blood, other potentially, infectious fluid++, or tissue	Offer	ZDV plus 3TC
Mucous Membrane	Blood	Offer	ZDV plus 3TC +/- EFV or NVP
	Fluid containing visible blood, other potentially infectious fluid ++, or tissue	Offer	ZDV plus 3TC
	Other body fluid (e.g., urine)	Do not offer	Do not offer
Skin	Increased risk**** Blood	Offer	ZDV plus 3TC, +/- EFV or NVP**
	Fluid containing visible blood, other potentially infectious fluid ++, or tissue	Offer	ZDV plus 3TC
	Other body fluid (e.g., urine)	Do not offer	Do not offer

\* Any exposure to concentrated HIV (e.g., in a research laboratory or production facility) is treated as per cutaneous exposure to blood with highest risk.

+ **Recommend** Post exposure prophylaxis (PEP) should be recommended to the exposed worker with counseling

**Offer** PEP should be offered to the exposed worker with counseling

**Not offer** PEP should not be offered because these are not occupational exposures to HIV.

\*\*\* Regimens: Zidovudine (ZDV) 300mg twelve hourly; Lamivudine (3TC), 150 mg twelve hourly; Efavirenz 600mg nocte or Nevirapine 200mg 12 hourly, Prophylaxis is given for 4 weeks.

+++ **Highest risk** BOTH larger volume of blood (e.g., deep injury with large diameter hollow needle previously in source patient's vein or artery, especially involving an injection of source patient's blood) AND blood containing a high titer of HIV (e.g., source with acute retroviral illness or end stage AIDS)

**Increased risk** EITHER exposure to larger volume of blood OR blood with a high titer of HIV.

**No increased risk** NEITHER exposure to larger volume of blood NOR blood with a high titer of HIV (e.g., solid suture needle injury from source patient with asymptomatic HIV infection)

\*\*Possible toxicity of additional drug may not be warranted

++ Includes semen; vaginal secretions; cerebrospinal, synovial, pleural, peritoneal, pericardial, and amniotic fluids.

\*\*\*\* For skin, risk is increased for exposures involving a high titer of HIV, prolonged contact, an extensive area, or an area in which skin integrity is visibly compromised. For skin exposures without increased risk, the risk for drug toxicity outweighs the benefit of PEP.

++ Recommended 2 drug PEP for adults in Tanzania is AZT 300mg 12hourly and 150mg 3TC 12hourly for 4 weeks.

+++ Recommended expanded 3 drug PEP for adults in Tanzania is AZT 300mg 12 hourly, 150mg 3TC 12 hourly and 600mg Efavirenz nocte or 200mg Nevirapine 12 hourly for 4 weeks.

**Table 23 (a): Recommended HIV post exposure prophylaxis regimens for injuries**

**INFECTION STATUS OF THE SOURCE**

Exposure type	HIV-positive Class 1 <sup>+</sup>	HIV-positive Class2 <sup>+</sup>	Source of Unknown HIV status <sup>†</sup>	Unknown source <sup>§</sup>	HIV- Negative
Less severe <sup>¶</sup>	Recommend basic 2-drug PEP <sup>++</sup>	Recommend expanded 3-drug PEP	Generally, no PEP warranted however, consider basis 2- drug PEP <sup>**</sup> for source with HIV risk factors	Generally, no PEP warranted; however, consider basic 2-drug PEP <sup>**</sup> in setting where exposure to HIV infected persons is likely	No PEP warranted
Large volume <sup>§§</sup>	Recommend expanded 3-drug PEP <sup>+++</sup>	Recommend expanded 3 drug PEP	Generally, no PEP warranted; however, consider basic 2-drug PEP <sup>**</sup> for source with HIV risk factors <sup>++</sup>	Generally, no PEP warranted; however, consider basic 2- drug PEP <sup>**</sup> in setting where exposure to HIV-infected persons is likely	No PEP warranted

+Class 1 — asymptomatic HIV infection or known low viral load (e. g., <1,500 RNA copies/ mL).

Class 2 - symptomatic HIV infection, AIDS, acute sero-conversion, or known high viral load.

If drug resistance is a concern, obtain expert consultation. Initiation of post exposure prophylaxis (PEP) should not be delayed pending expert consultation, and, because expert consultation alone cannot substitute for face- to- face counselling, resources should be available to provide immediate evaluation and follow- up care for all exposures.

† Source of unknown HIV status (e. g., deceased source person with no samples available for HIV testing).

§ Unknown source (e. g., a needle from a sharps disposal container).

¶ Less severe (e. g., solid needle and superficial injury).

\*\* The designation "consider PEP" indicates that PEP is optional and should be based on an individualized decision between the exposed person and the treating clinician. If PEP is offered and taken and the source is later determined to be HIV- negative, PEP should be discontinued.

§§ More severe (e. g., large- bore hollow needle, deep puncture, visible blood on device, or needle used in patient's artery or vein).

**Table 22: Recommended HIV post exposure prophylaxis for mucous membrane exposure and non-intact skin\* exposure**

**INFECTIOUS STATUS OF THE SOURCE**

Exposure type	HIV-positive Class 1 <sup>†</sup>	HIV-positive Class2 <sup>†</sup>	Source of unknown HIV status <sup>§</sup>	Unknown source <sup>¶</sup>	HIV- Negative
Small volume <sup>**</sup>	Consider basic 2-drug PEP <sup>††</sup>	recommend basic 2-drug PEP	Generally, no PEP warranted however, consider basis 2- drug PEP <sup>††</sup> for source with HIV risk factors	Generally, no PEP warranted; however, consider basic 2-drug PEP <sup>††</sup> in setting where exposure to HIV infected persons is likely	No PEP warranted
Large volume <sup>§§</sup>	Recommend basic 2-drug PEP	Recommend expanded 3 drug PEP	Generally, no PEP warranted; however, consider basic 2-drug PEP <sup>††</sup> for source with HIV risk factors	Generally, no PEP warranted; however, consider basic 2- drug PEP <sup>††</sup> in setting where exposure to HIV-infected persons is likely	No PEP warranted

\* For skin exposures, follow- up is indicated only if there is evidence of compromised skin integrity (e. g., dermatitis, abrasion, or open wound).

† HIV- Positive:

Class 1 — asymptomatic HIV infection or known low viral load (e. g., <1,500 RNA copies/ mL)

Class 2 - symptomatic HIV infection, AIDS, acute seroconversion, or known high viral load. If drug resistance is a concern, obtain expert consultation. Initiation of postexposure prophylaxis (PEP) should not be delayed pending expert consultation, and, because expert consultation alone cannot substitute for face- to- face counselling, resources should be available to provide immediate evaluation and follow- up care for all exposures.

§ Source of unknown HIV status (e. g., deceased source person with no samples available for HIV testing).

¶ Unknown source (e. g., splash from inappropriately disposed blood).

\*\* Small volume (i. e., a few drops).

†† The designation, "consider PEP," indicates that PEP is optional and should be based on an individualized decision between the exposed person and the treating clinician. If PEP is offered and taken and the source is later determined to be HIV- negative, PEP should be discontinued.

§§ Large volume (i. e., major blood splash).

**14.2.6 Timing of Post Exposure prophylaxis(PEP)**

PEP should be initiated as soon as possible. Studies suggest that while PEP probably is substantially less effective when started more than 24-36 hours post-exposure, the interval after which no benefit is gained from PEP for humans is undefined. Therefore, if appropriate for the exposure, PEP should be started even when the interval exceeds 36 hours.

**14.2.7 Duration of Post Exposure Prophylaxis(PEP)**

The optimal duration of PEP is unknown. Because 4 weeks of AZT appeared protective in occupational and animal studies, PEP should be administered for 4 weeks, if tolerated.

## **14.2.8 Follow-up of Health care worker Exposed to HIV**

Health care worker with occupational exposure should be tested at baseline, 6 weeks, 12 weeks and 6 months post exposure to HIV. HIV testing should also be performed on any exposed person who has an illness that is compatible with an acute retroviral syndrome, regardless of the interval since exposure.

## **14.2.9 Monitoring and Management of PEP Toxicity**

If PEP is used, Health care worker should be monitored for drug toxicity by Laboratory testing at baseline and again 2 weeks after starting PEP. The scope of testing should be based on medical conditions in the exposed person and the toxicity of drugs included in the PEP regimen. Minimally, laboratory monitoring for toxicity should include a complete blood count and renal and hepatic function tests.

## **14.3 PEP in men and women who have been raped/sexually assaulted**

### **14.3.1 Counselling**

All women and men, aged 18 years and older, presenting to a health facility after being raped should be counselled by the examining health care worker about the potential risks of HIV transmission post rape. Younger children need to be managed at specialised sites where there is the expertise in dealing with traumatized children and the prescription of ART.

### **14.3.2 When to start**

All women and men aged 18 years and older, presenting to a health facility within 72 hours of being raped should be offered PEP.

It is important to establish the patient's base-line status before administering PEP. Patients who are known to be HIV positive should be referred to an appropriate health care clinic for long-term management of their HIV infection.

For those whose status is unknown, a HIV test should be required. It is important that this be enforced to prevent the potential for resistant developing should the individual be HIV positive and therefore the virus be exposed to ARVs just for the PEP period. In addition, PEP for such individuals would not be effective in preventing primary infection since they are already infected. Only those who are found to be HIV negative should receive PEP.

### **14.3.3 Drug Regimen**

The recommended treatment regimen is:

- AZT 300 mg 12 hourly+ 150mg 3TC 12 hourly daily for 4 weeks
- A third drug, EFV or NVP should be added if:
- There have been multiple perpetrators

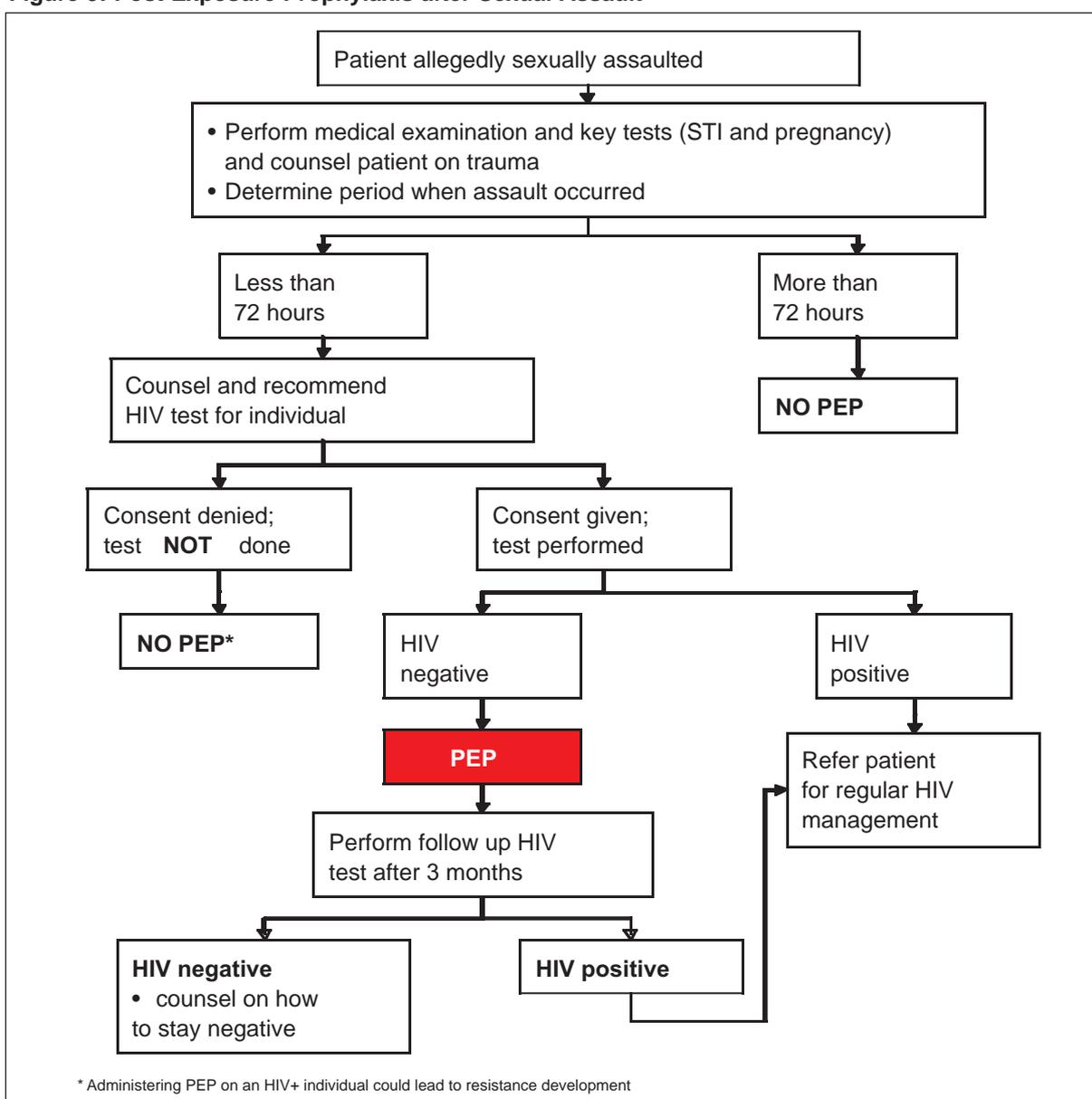
- Anal penetration occurred
- There is obvious trauma to the genital areas
- One of the perpetrators is known to be HIV positive
- The noted contraindications for each of those drugs should be considered as detailed in Chapters 11 and 12.

### 14.3.4 Patient monitoring

Routine testing with a full blood count and liver enzymes for patients on AZT and 3TC is not recommended for such a short duration of therapy. Blood tests should be performed according to patient's condition.

3 months after the PEP period, the individual should return for a confirmatory set of HIV tests to determine that the treatment was effective. If it was not effective and therefore they became infected, they should be enrolled in the care program at the CTC and monitored appropriately as all HIV positive individuals.

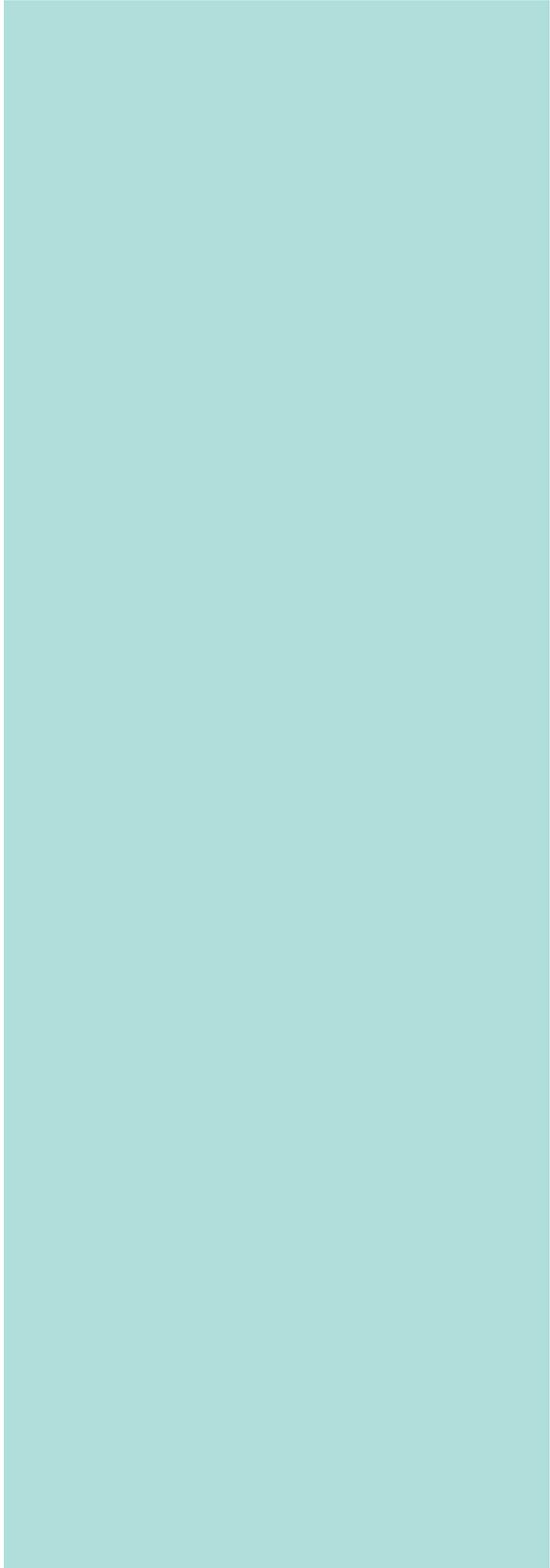
**Figure 9: Post Exposure Prophylaxis after Sexual Assault**





## **Chapter 15**

# Nutrition in HIV and AIDS



### 15.1 Malnutrition in HIV and AIDS

Nutrition and HIV are linked. Any immune impairment as a result of HIV and AIDS can contribute to malnutrition. Malnutrition leads to immune impairment, worsens the effects of HIV, and contributes to a more rapid progression of the disease. Thus, malnutrition both contributes and is a result of HIV disease progression.

A person who is malnourished and then acquires HIV is more likely to progress faster to AIDS because the body is already weak and cannot fight co-infections, particularly without access to ARVs and prophylactic medications. A well nourished person has a stronger immune system for coping with HIV and fighting illness. Figure 10 illustrates the relationship between good nutrition and resistance to infection in the context of HIV and AIDS.

Timely improvement of nutritional status can help to strengthen the immune system, thereby reducing the incidence of infections, preventing loss of weight and loss of lean body mass, and delaying disease progression.

**Figure 10: The Cycle of Good Nutrition and Resistance to Infection in Context of HIV and AIDS**



The following symptoms and illnesses commonly caused by HIV infection can lead to malnutrition.

- **Anorexia:** Anorexia as a loss of appetite may occur as a side effect of medications. It leads to general weight loss and is common when individuals are depressed.
- **Diarrhoea:** There are several causes of diarrhoea including bacterial and viral infections, parasites,

and as a side effect of some medical treatments. Diarrhea also reduces appetite and leads to poor nutrient absorption. Severe malnutrition can occur following a prolonged period of diarrhoea.

- **Fever:** Fever is common in PLHA and does not necessarily indicate serious illness. The reasons for fever vary, and it is often hard to determine whether fever is due to HIV or another illness, such as malaria or untreated opportunistic infections. The body's energy expenditure increases with fever, causing increased energy requirements.
- **Nausea and Frequent Vomiting:** These can result from the drugs used to treat HIV and AIDS or from opportunistic infections.
- **Thrush:** Thrush is common in HIV infected people. These can result in difficulty eating foods, loss of appetite, reduced food intake and malabsorption, leading to weight loss.
- **Anemia-** This can result from poor food intake or caused by HIV itself

## 15.2 Nutrient Requirements for People Living with HIV and AIDS (PLHA)

**Energy requirements:** The HIV infected person has additional energy needs because of:

- Energy used for HIV infection and opportunistic infections
- Nutrient malabsorption
- Altered metabolism

In the absence of AIDS symptoms (WHO Stage 1), HIV-infected persons should increase energy intake by 10 percent over the level of energy intake recommended for healthy non-HIV-infected persons of the same age, sex and physical activity level.

In the presence of symptoms (WHO Stage 2 and above), all HIV-infected persons, should increase energy intake by 20-30% over the level of energy intake recommended for healthy non-HIV-infected persons of the same age, sex and physical activity level.

**Protein requirements:** HIV-infected persons do not require more protein than the level recommended for healthy non-HIV infected persons of the same age, sex and physical activities level.

**Micronutrient requirements:** The role of micronutrients in immunefunction and infectious diseases is well established. It is recommended to ensure micronutrient intake at recommended daily allowance (RDA) levels. HIV infected individuals are encouraged to achieve this by consuming variety of foods. In case of deficiency, supplementation may be necessary. There is evidence that some micronutrient supplements e.g Vitamin A, Zinc and Iron cut higher dose, may produce adverse outcomes in HIV infected persons.

## 15.3 Good Dietary Practices

Good dietary practices play an important role in maintaining a healthy lifestyle and healthy body. An HIV-infected person already has a weakened immune system. A nutritious diet can help maintain the proper functioning of the immune system and provides needed energy, protein, and micronutrients during all stages of the HIV infection. This can be obtained through a balanced meal.

## Balanced Meal

There is no single food that contains all the nutrients that the body needs, except breast milk for infants up to six months of age. For a balanced meal use at least one food from each of the following food groups.

- Cereals, roots, tubers, bananas  
These are mainly staples. They include maize, millet, rice, sorghum, cassava, yams, potatoes and bananas.
- Pulses, nuts and foods of animal origin  
Foods in this group include groundnuts, cashew nuts, meat, fish, milk, eggs, insects e.g. senene, kumbikumbi, and caterpillars, beans, peas etc.
- Fruits  
This group includes all types of fruits such as mangoes, oranges, guava, tangerines, bananas, ubuyu, ukwaju, mabungo etc.
- Vegetables  
This group includes all types i.e exotic and indigenous vegetables such as sweet potato leaves, pumpkin leaves, tomatoes, amaranth, okra, carrots, pumpkins, mlenda, figiri, mnavu.
- Sugar and fats  
These are needed in moderation, they include ghee, lard, butter, margarine, coconut oil, oil seeds such as sunflower and groundnuts, sugars like honey etc.
- Water  
Although water is not food group it is important for life and is necessary everyday. Water aids digestion, absorption and transportation of nutrients in the body. It is recommended that a person should drink at least eight glasses (1.5 litres) a day.
- It is important to eat variety of foods together, because some of the foods depend on each other for some nutrients to be utilized well by the body e.g. for absorption of non-heamo iron from vegetables vitamin C is needed therefore vegetables should be eaten with fruits; also energy is utilized well in presence of vitamin B in the food.

### Nutrient requirements for HIV positive Individuals (WHO 2003)

- Energy: is increased by 10% asymptomatic stage and 20-30% during symptomatic HIV
- Protein: No evidence of additional need
- Multiple Micronutrient Supplements:
  - Best achieved through adequate diet. Where intakes cannot be achieved, micronutrient supplements may be needed (at RDA levels).
  - There is evidence that some micronutrient high dose supplements eg. Vit. A, Zinc and Iron can produce adverse outcomes in PLHA
  - Iron-folate supplementation for pregnant and lactating women: There is no change on the usual recommendation (400µg folate and 60 mg iron daily for prevention and twice per day for treatment)
  - The usual additional nutritional requirements for pregnant and lactating women apply.

## TIPS FOR HEALTHY AND NUTRITIOUS LIFESTYLES for PLHA

- Eat **variety** of foods
- Eat **small** meals frequently (especially for a very sick person)
- Be physically active, avoid alcohol, avoid smoking
- Add nutrient-dense foods (nuts, oil, fat, milk, oil seeds)
- Use **spices** for appetite and absorption: ginger, garlic, cardamom, lemon
- Germination and sprouting; fermentation (increases nutrient content and improves digestions and absorption)
- Observe food safety, improve cooking methods and hygiene principles

Table 24 describes the role of various micronutrients and their importance for maintaining a healthy body. It provides examples of foods that are rich sources of micronutrients. Some of the foods listed are available only during specific seasons.

**Table 24: The Role and Sources of Selected Micronutrients**

<b>Micronutrient</b>		<b>Role Food sources</b>
Vitamin A	Growth and function of T and B cells for immunity, maintenance of mucosal epithelial cells, including the lining of the respiratory, gastrointestinal and gastro-urinary tracts; vitamin A deficiency is associated with increased adult mortality, higher infant mortality, and child growth failure.	Liver and dairy products, kidney, egg, some fishes, yellow sweet potato, pumpkin, palm oil, carrot, dark green leafy vegetables, fruits, such as papaya and mango.
Thiamine Vitamin B1	Important for energy metabolism; support appetite and nervous system functions	Whole- grain cereals, beans, meat, fish, chicken, egg
Riboflavin Vitamin B2	Important for energy metabolism; support normal vision, health, and integrity of skin	Milk, egg, liver, yoghurt, meat, dark green leafy vegetables, whole grain cereals, fish and beans
Niacin Vitamin B3	Essential for energy metabolism, support health and integrity of the skin and nervous and digestive systems	Milk, egg, meat, poultry, peanuts, groundnuts, whole-grain cereals, fish
Pyridoxine Vitamin B6	Facilitates metabolism and absorption of fats and protein; helps make red blood cells	Sweet potato, white beans, avocado, cabbage, broccoli, meat, fish, green leafy vegetables
Cobalamin Vitamin B12	Important for new cell development and maintenance of the nerve cells	Red meat, fish, chicken, shellfish, cheese, eggs, milk, fermented products
Ascorbic Acid	Important for protein metabolism, immune function	Citrus fruits, such as orange, lemon,
Vitamin C	and iron absorption; increases resistance to infections	tangerine, guava, baobab, tomato
Vitamin E	Protects cell structures and facilitates resistance against diseases	Leafy vegetables, vegetable oils, peanut, egg yolk, vegetables, nuts, seeds, and liver
Calcium	Builds strong bones and teeth; important for functioning of heart and muscle functions, blood clotting and pressure and immune defences	Milk, dark green leafy vegetables, shrimp, dried fish, beans, lentils, peas, whole grain millet, oil seeds, okra

Iodine	Ensures the development and proper functioning of the brain and the nervous system; important for growth development and metabolism	Fish and other seafood, salt with iodine
Iron	Transports oxygen to the blood, eliminates old red blood cells and builds new cells; required for utilization of energy and metabolism by cells	Red meat, poultry, shellfish, egg, peanut, groundnuts, leafy vegetables, lentils, beans, some cereals, dried fruits
Magnesium	Strengthens the muscles; important for nervous system function, involved in bone development, maintenance of teeth	Cereals, dark green vegetables, seafood, nuts, legumes, groundnuts
Selenium	Prevents impairment of the heart muscle; enhances the body's antibacterial and antiviral defences	Seafood, liver, meat, nuts, unrefined grains, brown rice, wheat germ, whole grain cereals, carrot, onion, milk, egg

## 15.4 Dietary Practices and Nutrition for AIDS Related Symptoms

Dietary management of AIDS-related symptoms refers to the strategy of using food and dietary practices to alleviate the effects of AIDS-related symptoms on food intake and nutrient absorption. It is therefore important to :

- Ensure adequate food intake by; adding more flavour, encouraging PLHA to take small but frequent quantities of meals; and by presenting foods with a texture that can be easily eaten by PLHA;
- Ensure comfort while eating;
- Provide more nutrient dense foods to compensate for nutrient losses.
- Prevent dehydration that occurs due to diarrhoea and fever;
- Complement medical treatment, including the provision of ARVs;
- Reduce the severity of symptoms by providing specific nutrient needs
- Increase intake of foods that may contribute to strengthening the immune system;
- Manage specific symptoms (e.g., nausea, vomiting, diarrhoea and constipation).

## 15.5 Nutritional Issues Associated with ARVs and Other Modern Medicines

People infected with HIV may take various modern medications. These include antibiotics to treat opportunistic infections, ARVs to treat HIV and AIDS, anti-malarial, anti-helminthe, and anti-fungal medications.

**Foods and medications can interact in 4 major ways to create health and nutritional positive and negative outcomes in PLHA.**

**Figure 11: Types of Food – Medication Interactions**

These are as shown below:

1. FOOD	 (Affects)	MEDICATION ABSORPTION, METABOLISM, DISTRIBUTION, EXCRETION
2. MEDICATION	 (Affects)	NUTRIENT ABSORPTION, METABOLISM, DISTRIBUTION, EXCRETION
3. MEDICATION SIDE EFFECTS	 (Affects)	FOOD CONSUMPTION, NUTRIENT ABSORPTION
4. MEDICATION + CERTAIN FOODS	 (Creates)	UNHEALTHY SIDE EFFECTS

Some side effects of medications can be similar to certain AIDS-related symptoms and call for similar dietary management. Proper dietary management can help to manage some side effects. The following are examples:

- **Changes in taste:** The protease inhibitors saquinavir and ritonavir cause changes in taste and can cause food to taste metallic, sweeter, sourer, or too salty, which. This in turn, may cause an individual to consume less food. This can be improved by using flavour enhancers such as salt, sugar, spices, vinegar, or lemon to stimulate the taste buds, increase taste acuity, and mask any unpleasant flavours. Adding spices like onions to soup will boost flavour and can help to improve food intake.
- **Anorexia:** Several medications, such as isoniazid, lamivudine and stavudine, may cause anorexia and lead to reduced food intake. The dietary management of anorexia requires eating small and frequent meals and favourite foods. PLHA that experience anorexia should eat five to six small meals a day and should include energy- and nutrient-dense foods at each meal to ensure adequate nutrient intake. It is also important to maintain as much physical activity as possible, such as walking in fresh air, which also helps to stimulate appetite.

Some ARVs have been associated with increased risk of osteoporosis and weakening of bones that may require medical and dietary consideration. For osteoporosis, a balanced diet with high calcium foods, such as milk, yoghurt, cheese, and vitamin D supplement is recommended, along with medical care.

Some side effects of ARVs are similar to symptoms of opportunistic infections, such as diarrhoea. Therefore, the health worker must continue to be alert to recognize symptoms of infections and treat these infections appropriately.

## Multiple Medications

Treatment of AIDS may require taking many pills on a daily basis, which can make it difficult to maintain food intake. If medications make it difficult to eat, a person is less likely to strictly adhere to the drug regimen. This can create drug resistance, especially in the case of ARVs. It is vital that health workers explain the necessity of eating variety of foods, while also adhering to the drug regimen.

Multiple medications may have multiple food-drug interactions and side effects that require setting specific timing, identifying recommended foods, and foods to be avoided for each drug. Health workers should spend enough time with the PLHA, to list all the drugs taken and counsel on the dietary management of the side effects and the interactions with food.

## Medication and Food Can Cause Unhealthy Side Effects

The combination of some medications and food can create unhealthy side effects or reduce the positive impacts of the drugs. Tables 25, 26 and 27 lists some of the medications used in Tanzania. The tables shows their purpose, potential side effects, and recommended ways of taking the medications.

**Table 25: Modern medications and Recommended Food Intakes and Side Effects**

Medication	Purpose	Nutrition Recommendations	Foods/Beverages /Herbs to Avoid	Potential Side Effects
Sulfonamides: Sulfamethoxazole, Cotrimoxazole (Bactrim ® Septra ®)	Antibiotic for treating pneumonia and toxoplasmosis	Take with food		Nausea, vomiting, abdominal pain
Rifampin	Treatment of TB	On an empty stomach one hour before or two hours after meals	Alcohol	Nausea, vomiting, diarrhoea, loss of appetite
Isoniazid	Treatment of TB	One hour before or two hours after meals Supplement with 10 mg vitamin B6 daily	Alcohol	Anorexia, diarrhoea; may cause possible reactions with foods such as bananas, beer, avocados, liver, smoked or pickled fish, yeast, yogurt; may interfere with vitamin B6 metabolism, therefore will require vitamin B6 supplement to prevent peripheral neuropathy and anaemia
Quinine	Treatment of malaria	With food		Abdominal or stomach pain, diarrhoea, nausea, vomiting; lower blood sugar
Sulfadoxine and Pyrimethamine (Fansidar ®)	Treatment of Malaria Pyrimethamine is also used to treat toxoplasmosis	With food and consume large quantities of water Supplement daily with folic acid (leucovorin), the active form of folate (5-10 mg/day)		Nausea, vomiting, taste loss and diarrhoea; not recommended if folate deficient; not recommended for breastfeeding women
Chloroquine	Treatment of malaria	With food		Stomach pain, loss of appetite, nausea, vomiting; not recommended for breastfeeding women
Fluconazole	Treatment of thrush	With food		Nausea, vomiting, diarrhea; can be used during breastfeeding
Nystatin ®	Treatment of thrush	With food		Infrequent occurrence of diarrhea, vomiting, nausea

**Table 26: Modern medications and recommended food intakes and side effects of Antiretroviral drugs**

Medication (ARV)	Nutrition Recommendations	Foods/Beverages /Herbs to Avoid	Potential Side Effects
Abacavir (ABC) NNRTI	Can be taken without regard to food		Nausea, vomiting, fever, allergic reaction, anorexia, abdominal pain, diarrhoea, anaemia, rash, hypotension, pancreatitis, dyspnea, weakness and insomnia, cough, headache
Didanosine (ddl) NNRTI	Take one hour before or two hours after eating with water only	Alcohol, juice	Anorexia, diarrhoea, nausea, vomiting, pain, headache, weakness, insomnia, rash, dry mouth, loss of taste, constipation, stomatitis, anaemia, fever, dizziness, pancreatitis; do not take with antacid containing aluminium or magnesium.
Lamivudine (3TC) NNRTI	Can be taken without regard to food	Alcohol	Nausea, vomiting, headache, dizziness, diarrhoea, abdominal pain, nasal symptoms, cough, fatigue, pancreatitis, anaemia, insomnia, muscle pain, and rash
Stavudine (d4T) NNRTI	Can be taken without regard to food	Limit alcohol	Nausea, vomiting, diarrhea, peripheral neuropathy, chills and fever, anorexia, stomatitis, diarrhoea, anaemia, headaches, rash, bone marrow, and pancreatitis.
Zidovudine (AZT) NNRTI	Can be taken with food, but do not take with a high fat meal	Alcohol	Anorexia, anaemia, nausea, vomiting, bone marrow suppression, headache, fatigue, constipation, fever dizziness, dyspnea, insomnia, muscle pain, rash
Efavirenz NRTI	Can be taken with food, but do not take with a high fat meal	Alcohol	Elevated blood, cholesterol levels elevated Triglycerides levels, rash, dizziness, anorexia, nausea, vomiting, diarrhoea, dyspepsia, abdominal pain, flatulence
Nevirapine (NVP) NRTI	Can be taken without regard to food	St John's wort	Nausea, vomiting rash, fever, headache, skin reactions, fatigue, stomatitis, abdominal pain, drowsiness, paresthesia; high hepatotoxicity
Lopinavir PI	Can be taken without regard to food	St John's wort	Abdominal pain, diarrhoea, headaches, headache, weakness nausea; may increase the risk of lipodystrophy and /or diabetes
Nelfinavir PI	Take with meal or light snack	St John's wort	Diarrhea, flatulence, nausea, abdominal pain, rash; may increase the risk of lipodystrophy
Ritonavir PI	Take with meal if possible	St John's wort	Nausea, vomiting, diarrhoea, hepatitis, jaundice, weakness, anorexia, abdominal pain, fever, diabetes, headache, dizziness; may increase the risk of lipodystrophy
Saquinavir PI	Take with meal or light snack; take within two hours of a high fat meal and high calcium meal Garlic supplements	St John's wort	Mouth ulceration, taste changes nausea, vomiting, abdominal pain, diarrhoea, constipation, flatulence, weakness rash, headache; may increase the risk of lipodystrophy

**Table 27: Food Interactions and Side Effects of Isoniazid**

Medication	Dietary Interactions and the Medication Side Effects	Dietary Responses/Instructions for PLHA
Isoniazid TB treatment	Food reduces absorption of isoniazid	Do not take isoniazid during meals. Take one hour before or two hours after meals.
	May affect vitamin B6 metabolism	Daily consumption of food sources of vitamin B6 such as white beans, maize avocado, meat, and fish, or vitamin B6 (25 to 50 mg daily) supplementation is recommended
	Increased risk of hepatitis when combined with alcohol	Avoid alcohol.
	Anorexia (i.e., loss of appetite) Diarhoea	Eat small and frequent meals. Eat favourite foods. Drink plenty of fluids and eat energy- and nutrient rich food. Avoid fried foods.

## 15.6 Guidance on Effective Nutrition and Medication Management for Antiretroviral Therapy (ART)

The following are guidelines for health workers that can help promote effective nutrition and medication management for ART.

1. Counsel on:

- Understanding that ARVs are not a cure.
- Food effects on the medications' efficacy, medication effects on nutrient absorption and metabolism, and the side effects of the medications.
- The timing for taking medications and food/meals. Explain the necessity of accurate timing for meals and drugs. Involve PLHA and family members in constructing a meal and drug-taking timetable and in selecting the foods available to address the negative effects of medications and food interactions.
- The dietary management of the medications' negative effects on nutrient absorption, metabolism, distribution, and excretion and the side effects of the medications. Highlight the foods that should not be taken while taking the medications and provide appropriate guidance.

2. Provide psychosocial support at the onset of treatment.

3. Assess any difficulties that PLHA may be having in following the planned diet and timetable due to food access or availability, taste, or other reasons and whether there have been positive or negative changes in symptoms, side effects, or drug adherence. Consult with PLHA and suggest other options when recommended foods are not available.

Assessments help identify the most effective communications channels for disseminating the updated recommendations on dietary management of food and medication interactions to program planners, health workers, caregivers, and PLHA. Below are a series of questions that can guide health workers in carrying out an assessment:

- What ARVs and other medications are used?
- What are the specific ARV and medication-food interactions in the local context?
- What are the common side effects of these ARVs and medications? What known foods aggravate or alleviate the symptoms? What are the dietary responses?

- What medications, including modern and traditional, are taken for the treatment of opportunistic infections and the diseases common to the area? What are the drug-drug interactions? What are the drug-food interactions?
- What are the nutritional implications and the food recommendations to manage the side effects (e.g., nausea, loss of taste, poor nutrient absorption)? What is the effect of the medication on nutrient?
- What are the most effective communications channels to keep PLHA, caregivers, counsellors, and program managers informed about ARVs and other medications and their implications for nutrition.

## 15.7 AIDS-wasting Syndrome

AIDS-wasting syndrome is defined as a 10 percent weight loss of baseline body weight together with either chronic diarrhoea or weakness and fever for one month or more in the absence of a concurrent illness other than HIV infection.

Wasting is characterized by a loss of lean tissues. Lean tissues in the body are responsible for most of the body's metabolic functions including processing medications. The body starts to lose its major functions as damage to the immune system and weight loss progress. One can monitor weight loss in adults by using body mass index (BMI)

The principles of BMI and references are as follows:

Body Mass Index =  $\frac{\text{Weight (Kg)}}{\text{height (m}^2\text{)}}$       or       $\frac{\text{Weight (Kg)}}{\text{Height (M}^2\text{)}} = \text{BMI}$

BMI references: (WHO)

underweight BMI < 18.5

Normal BMI = 18.5-24.9

Over weight = 25-29.9

Obese BMI > 30 and above

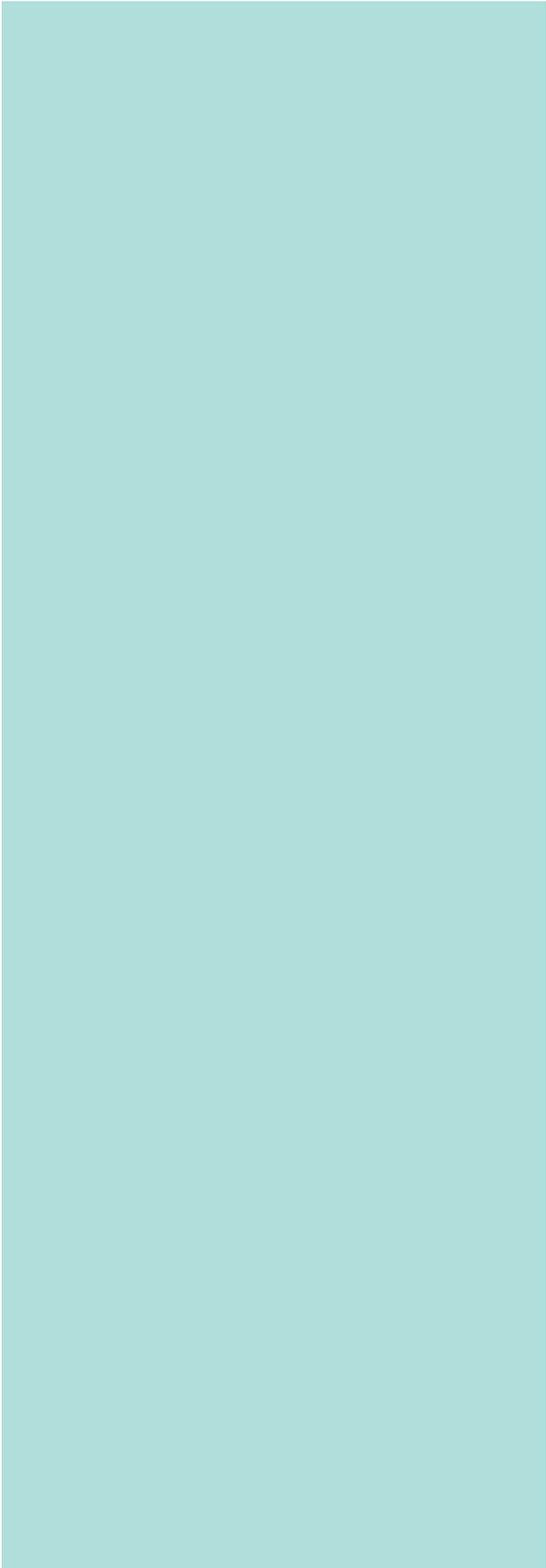
Even without using BMI, unintended weight loss of 6-7 kg one month is not a good sign.





## **Chapter 16**

# Management of Antiretroviral Medicines



### 16.1 Prescriptions

Only trained and authorized prescribers in certified health care facilities should write ARV prescriptions.

### 16.2 Dispensing

Antiretroviral medicines should only be dispensed to treatment ready patients with clear instructions and advice. Antiretroviral drugs are prescription only medicines. Therefore a dispenser should ensure that the prescription is appropriately written and signed by an authorized prescriber whose name, signature and where applicable a prescriber code also appears on the prescription.

The prescriptions for ARVs should clearly indicate the name, age, sex of patient; medicines and dosage.

Antiretrovirals should only be given to the named patient or appointed adherence assistant.

Adequate time should be devoted for antiretroviral dispensing and counselling.

Pharmacist/dispenser should make sure that the patient understands the dosage and drug intake schedule as well as instructions regarding storage and food requirements. Possible drug interactions should be discussed with patient.

- Patients should be warned about possible side effects and measures to be taken to reduce them. Patients should be informed of side effects which require prompt and immediate return to the clinic.
- Pharmacist/Dispenser should respond to specific questions and problems related to ARV treatment encountered by patients (side effects, interactions).

### 16.3 Records

- Records of all the ARVs dispensed should be kept in a dedicated register book.
- ART Patient Cards
- Patient identification cards, which include medication **(CTC 1)**, are to be issued to each patient. Patients (or appointed adherence assistants where patients can not collect the medication themselves) will then present the cards to the dispenser every time they are collecting medicines. All medications received are to be recorded on the card.

#### Register at the Pharmacy

- The Pharmacist/Dispenser should record all the dispensed ARVs and sign in a dedicated register book located in the dispensing unit at the pharmacy.
- Reports on the consumption and stocks of drugs should be sent to the Ministry of Health through the DMO for Program monitoring.

## 16.4 Storage

To ensure proper control and security of ARVs and other drugs, the following procedures should be used at the facility pharmacy:

- Stock must be kept in high security storage area with a single pharmacist/pharmaceutical technician (at any one time) responsible for receipts and issues.
- Normal stock records must be kept for all receipts and issues. Ledgers must be maintained for each item. A running balance must be kept.
- At the end of each month, the pharmacist in charge must check the physical stock against the stock records.
- ARVs must be stored at the appropriate temperature. Drugs like Kaletra (Lopinavir/ritonavir) require refrigeration.
- The pharmacist should at all times maintain adequate stocks of ARVs for all required medications (first line, second line, adults, paediatrics)

## 16.5 Procurement

The procurement of ARVs will be done by the Medical Stores Department which will then distribute the medicines to all the accredited facilities across the country. Requisition of antiretrovirals from the facilities will follow the normal procedures except that a separate requisition form will be used.

On receipt of the drugs at the facility, the pharmacist should check the ARVs brought by MSD and sign the delivery note.

Closely monitored adequate buffer stock must be kept at all times to avoid stock outs.

### Ordering ARVs

Ordering of ARVs will be done by the pharmacist using the “Integrated logistic system” register which is made of **Form A<sub>1</sub>**: Dispensing Register for Antiretroviral drugs (ARVs) and **Form A<sub>2</sub>**: Report and Request for Antiretroviral drugs (ARVs). The built-in inventory control system is designed to ensure that drugs are ordered monthly based on existing stock levels and not on morbidity data. Relevant data on the consumption of the antiretroviral medicines must be kept and sent to the Ministry of Health every month, according to the MSD indent format.

Orders to the Medical Stores Department (MSD) should be made timely and well in advance to allow supplies to reach the facilities in time.

## **Collaborating with clinical staff**

While the pharmacist will not re-order ARVs based on morbidity data because consumption data will be available, the pharmacist should be prepared to work with clinical staff to obtain an estimate of the number of patients expected to be enrolled on therapy.

The pharmacist should keep the clinical staff informed on the current stock levels of ARVs, particularly on items nearing stockout. In the event of national-wide supply shortage of which the pharmacist may be the first person to know, this information should be communicated to the clinical staff so they can pursue the best course of action.

## **16.6 Monitoring of adverse drug events**

Monitoring and reporting of adverse drug events should follow the Tanzania Food and Drug Authority guidelines. Adverse drug reactions reporting forms will be distributed to facilities as they become certified to deliver ART.

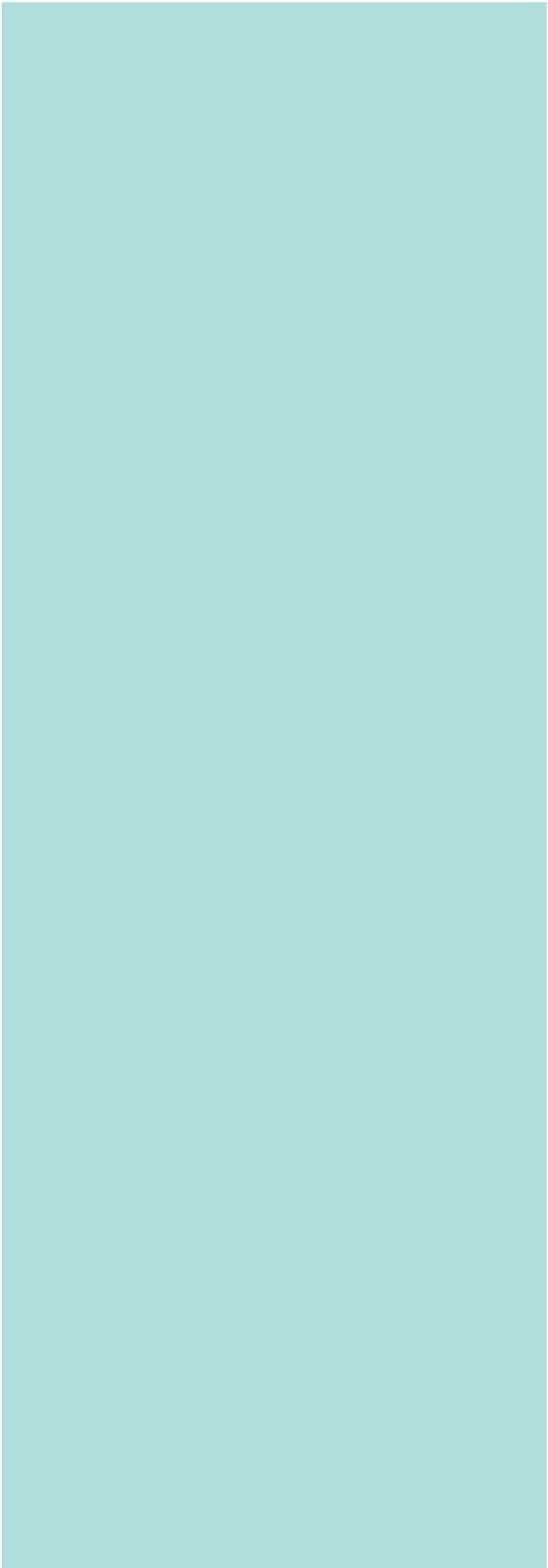
## **Audit**

Procurement, storage, distribution and dispensing procedures and records as well as stock on hand will be subject to internal and external audit. Given the cost and complexities of handling ARVs, frequent auditing is anticipated.



## **Chapter 17**

# Certification of Health Care Facilities as Care and Treatment Sites



## CERTIFICATION OF HEALTH CARE FACILITIES AS CARE AND TREATMENT SITES

### 17.1 Overview

In order to be able to reach the more than half million HIV positive people who are expected to require treatment as described in the National HIV and AIDS Care and Treatment Plan (NCTP), it will be necessary to have hundreds of healthcare facilities, public and private, of various sizes and capabilities spread equitably throughout the country. These facilities will each have to meet a minimum set of criteria in order to provide quality care and treatment services for People Living with HIV and AIDS (PLHA). As the large-scale provision of ART has yet to start in Tanzania, not all health facilities will currently meet the minimum standards needed for quality HIV and AIDS care and treatment. This implies that health facilities need to be strengthened before they can start and/or expand ART-services.

In order to have as many health facilities as possible qualify for the provision of ART to HIV and AIDS patients the National AIDS Control Programme (NACP) has developed a strengthening and certification procedure.

The objectives of this procedure are to:

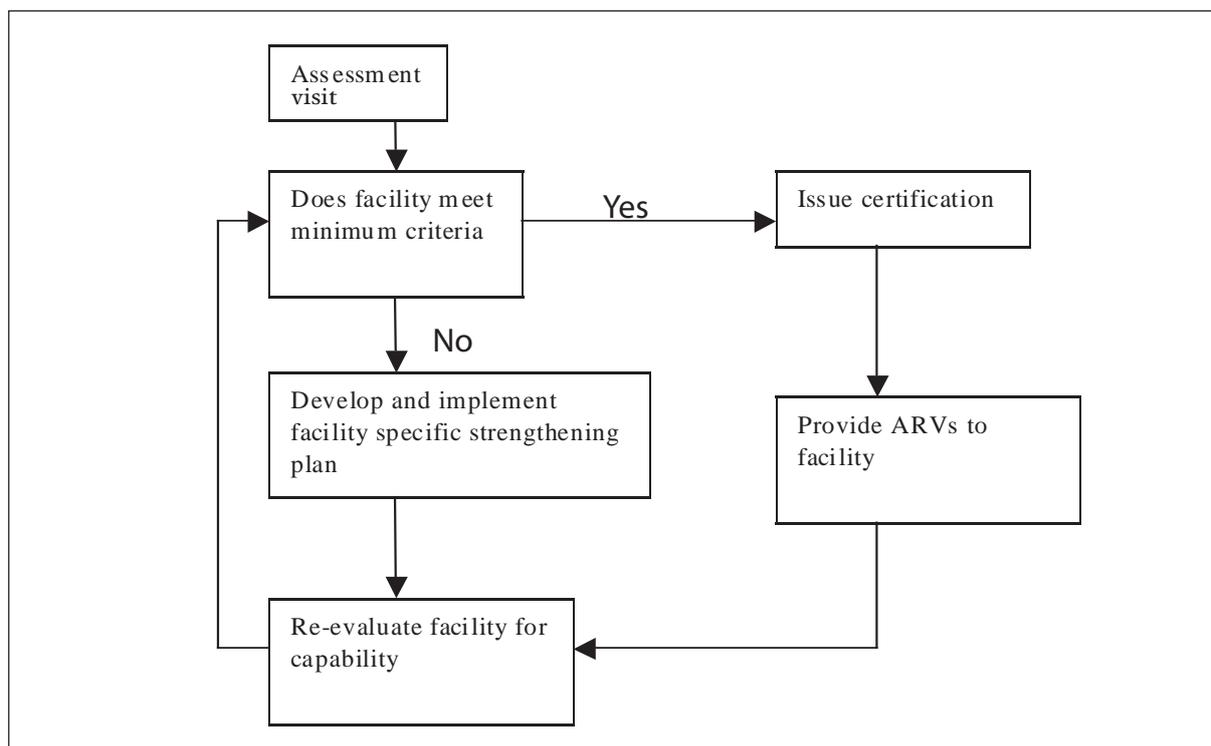
- Determine the availability and quality of the essential elements to start and/or expand ART
- Identify areas for strengthening and improvement to upgrade health facilities to be able to provide comprehensive care to PLHA
- Issue certification to health facilities to enable them to start/expand ART, once they have met a minimum set of criteria

It is important to keep in mind that the need for the minimum standard requirements is not to limit the number of institutions that can deliver care and treatment to PLHA. It instead has the dual role of not only assuring that care and treatment services are delivered, they are done so at an appropriate quality and standard, but also becomes a key way in which hospital needs can be identified and resources channelled to meet these needs. A rigorous certification process is therefore beneficial to all.

### 17.2 Selection and Strengthening Process

The Care and Treatment Unit has developed a system to identify facilities as potential ARV providers and to manage the strengthening process. The objective is to establish clinics to prescribe ARVs, monitor patient condition, and provide other care and treatment services for HIV positive patients.

**Figure 11. Preparing facilities for certification**



In conjunction with other divisions of the MoH, the Care and Treatment Unit will target on an annual basis the public facilities where ARV therapy will be administered. This targeting will be undertaken in full consultation with authorities at the local and regional levels.

It will be important to plan sufficiently far in advance to ensure that facilities can be strengthened to be full participants in the programme in time to meet the goals of the scaling-up plan. This is especially true in the case of ensuring sufficient personnel will be available at the proper time and for facilities which cannot participate without major construction work.

The targeted health facilities will be assessed by a multidisciplinary assessment team, composed of clinical, nursing, laboratory and pharmaceutical experts, in which representatives of the MoH and of the Region and/or District Council will participate. During the assessment visit a comprehensive assessment tool will be completed as well as a check list with minimum criteria for starting ART. These forms will contain the basic information for the preparation of a strengthening Plan.

The Strengthening Plan will be the key tool in preparing facilities for participation in the ARV programme. It will be jointly prepared and agreed upon by representatives of the Care and Treatment Unit, the Region/Council and managers of the target facility, to ensure the needs and remedies for each facility are correctly identified and prescribed. Over time as the program expands, it is planned that Regional Medical Officers, working as extensions of the Care and Treatment Unit, will play a major role in the targeting of facilities as well as in the preparation of Strengthening Plans. The RMO's office will be given additional resources to carry out this function, as explained in Section 11.3 of *The National Care and Treatment Plan 2003-2008*.

Each Strengthening Plan will develop detailed strategies for dealing with issues such as:

- Designation of a facility leader to take responsibility for preparation of the strengthening plan and supervision of the facility's participation in the HIV and AIDS Care and Treatment Programme.
- The recruitment of personnel for the Care and Treatment Team and other supporting units of the facility.
- Training of Care and Treatment Team members.
- Orientation and training of other healthcare workers at the facility and in nearby facilities to support the CTC
- Establishing appropriate clinic space.
- Development of a laboratory plan.
- Inventory of existing equipment, and ordering of new equipment.
- Maintenance plan for equipment.
- Building secure pharmacy.
- Participation in PMTCT programme.
- Preparation for linking with NTL, ante natal, and STI clinics.
- Linkages with other facility operations (wards, other clinics, support units etc.).
- Linkages with community resources (VCT, social support, etc.).
- Participation in locally based continuous care and IEC activities.
- Preparation of a facility-specific Operations Manual for HIV and AIDS Treatment and Care.

It is important to note that planning for strengthening should not be limited only to looking at the facility itself. For example, an analysis of the availability of VCT services in the area must be undertaken and preparations made for increasing the number (or effectiveness) of sites if necessary. These activities will require coordination with other sections of the MoH, community leaders and resources, NGOs and other providers of VCT services.

Other important activities outside the facility might include:

- Briefing local officials and leaders and liaising with district or lower level Multisectoral AIDS Committees.
- Cataloguing available continuous care activities in the community, and making plans to increase where necessary.
- Enlisting resources to help educate families and communities about the basics of HIV and AIDS medicine, particularly the role that treatment can play and the difficulties inherent in lifelong treatment for infected individuals and their families.

The Strengthening Plan will spell out in detail the implementation steps which are necessary for bringing the facility to the point where it can be certified as ready to receive, prescribe and distribute ARVs. The plan will also assign responsibility for each implementation step and develop a time line that will show when the strengthening process will be completed.

The Care and Treatment Unit will be responsible, again working closely with the Regional Medical Officer as its representative, to monitor progress in implementing the Strengthening Plan and ensuring adherence to the approved timeline.

### 17.3 The Certification Process

A major challenge for the Care and Treatment Unit will be to design a certification process that is rigorous enough to ensure quality care for patients at all levels, and yet is flexible enough to allow for creativity, initiative and reflection of unique local conditions on the part of the target institutions.

The key values the Care and Treatment Unit will look for in considering an application will include:

- Quality – Does the facility have a treatment system in place that will ensure quality health care for HIV and AIDS patients?
- Quantity – Is the facility prepared to treat a significant number of HIV+ individuals upon certification, and to increase the patient load as the staff gains experience?
- Accessibility – Will treatment be made available on an equitable basis to all Tanzanians regardless of ability to pay?
- Accountability – Are procedures and safeguards in place to ensure that funds, equipment, supplies, and medicines are properly used and accounted for?

With these values in mind, the strengthening plan should help prepare a facility to meet the minimum criteria outlined below. The Care and Treatment Unit should encourage flexibility and maximum integration with existing healthcare resources in the methods for meeting the minimum criteria. Target facilities should feel free to tailor the way they propose to meet a specific requirement in a manner which reflects the facility's individual needs and characteristics. In this way, best practices can be developed to aid in the scaling up efforts.

The target facilities for the first year will be primarily Regional and District Hospitals. The check list with minimum criteria highlights what each facility should have in place as a minimum at District and Regional levels.

### 17.4 Minimum criteria to start/expand ART:

#### (a) Organisation of HIV and AIDS care services within facility

- Space for registration of HIV and AIDS patients
- Clearly described a functioning patient flow plan (including referral within the facility)
- Project manager to coordinate the HIV and AIDS care and treatment services at the facility (this can be a member of the C&T team).

#### (b) Human resource capacity, training and continuous education

Dedicated Care and Treatment team consisting of the following:

- Assessing/prescribing clinician (MD/MO or AMO)
- ARV-evaluating clinician (AMO or CO)
- Nurse-counsellor (treatment counselling)
- Laboratory technician
- Pharmaceutical technician
- Data-clerk
- Above team must be trained according to approved national curricula
- Guidelines available: National HIV and AIDS care and treatment guidelines, PMTCT guidelines,
- Laboratory guidelines, Pharmacy guidelines, HBC-guidelines VCT guidelines.

### **(c) Clinical HIV and AIDS care and treatment services**

- Confidential consultation room
- TB-diagnosis and treatment services
- STI-diagnosis and treatment services

### **(d) Patient records and reporting systems**

- An established and working medical record system
- Locked area with limited access for medical records

### **(e) Continuum of Care: Organisation of HIV and AIDS care services with and between facility units, outside referral sites and community support services**

- A functional referral system from health facilities to the community and vice versa (linkage with HBC, NGO's, CBO's, FBO's and other community-based organisations), and to specialised referral facilities.
- System for patient tracking in place

### **(f) Counselling and Testing services**

- Confidential room
- VCT-counsellor

### **(g) Laboratory services**

#### **District level**

- Adequate facilities (enough space, 2-4 rooms)
- HIV-testing (rapid)
- Manual haematology
- Manual biochemistry
- Routine testing stool and urine
- Malaria blood smears
- TB sputum smears
- Pregnancy testing
- Screening for blood safety
- Refrigerator including freezer compartment
- Lockable room or cabinet for record storage
- Lockable inventoried store
- Use of SOPs
- Internal quality system
- External quality system
- Reliability of transportation

## **Laboratory Services:**

### **(h) Regional level (criteria for District level plus below criteria)**

- Emergency water reserve
- Electricity supply back up (generator, solar)
- Automated haematology (low volume)
- Automated biochemistry (low volume)
- ELISA testing
- CD4+ testing (low volume)
- Refrigerator including freezer compartment for samples
- Refrigerator including freezer compartment for reagents
- Freezer, -20°C

### **(i) Pharmacy services**

- Storage space for 1 month supply of ARV drugs
- Key policy in place (limited access)
- Functional ARV-tracking system
- Use of SOPs (national ARV-pharmacy instructions)
- Refrigerator

### **(j) Finances**

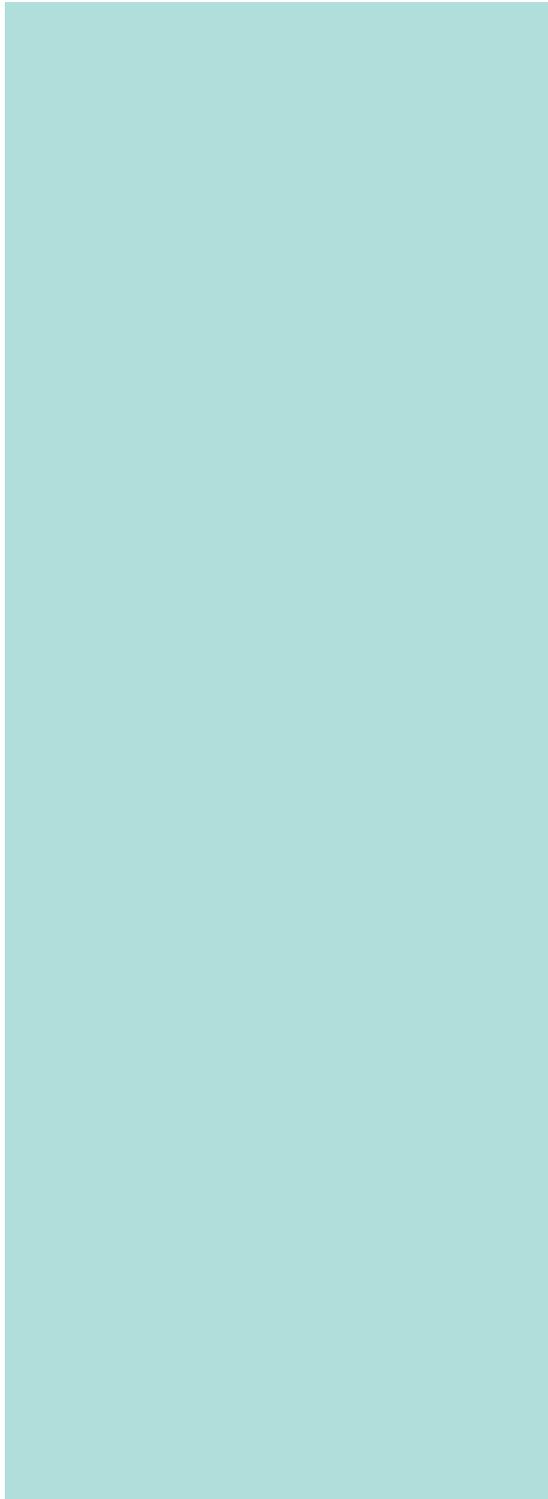
- Budget earmarked for strengthening clinical HIV and AIDS services
- External quality control arrangement in place
- Internal quality control arrangement in place





Annexes

Annexes



## Revised WHO clinical staging for adults and adolescents: presumptive and definitive criteria for recognizing HIV and AIDS-related clinical events (for Table 15)

For use in adults and adolescents aged 15 years and above with laboratory evidence of HIV infection.

Clinical event	Presumptive diagnosis	Definitive diagnosis
<b>Primary HIV infection</b>		
Unrecognized infection Acute retroviral syndrome	Acute febrile illness 2-4 weeks, post-exposure often with lymphadenopathy, pharyngitis and skin manifestations.	Detectable core P24 antigen and high blood HIV RNA, profound temporary lymphopenia and other transient blood abnormalities may occur. Not usually HIV antibody-positive until after symptoms. Seroconversion from HIV Ab-negative to Ab-positive.
<b>Clinical Stage 1</b>		
Asymptomatic	No symptoms reported and no signs on examination.	Not required.
Persistent generalized lymphadenopathy (PGL)	Swollen or enlarged lymph nodes >1 cm, in two or more non-contiguous sites, excluding inguinal nodes, in absence of known cause.	Not required but can be confirmed by histology (germinal centre hyperplasia, lymph node structure preserved).
<b>Clinical Stage 2</b>		
Moderate unexplained weight loss (<10% of presumed or measured body weight)	Reported weight loss but no obvious thinning of face or body.	Confirmed by documented weight loss.
Recurrent presumed bacterial URTI (two or more in any six-month period)	Symptoms complex, e.g. unilateral face pain with nasal discharge (sinusitis) or painful swollen eardrum (otitis media), cough with purulent sputum (bronchitis), sore throat (pharyngitis). Two or more documented occurrences of antibiotic-responsive URTI.	Not required but may be confirmed by laboratory studies where available, e.g. culture of suitable body fluid.
Herpes zoster	Painful rash of small fluid-filled blisters in distribution of a nerve supply, can be haemorrhagic on erythematous background, and does not cross midline. Current or in the last two years. Severe or frequently recurrent herpes zoster is usually associated with more advanced HIV disease.	Not required.
Angular cheilitis	Splits or cracks on lips at the angle of the mouth with depigmentation, usually respond to antifungal treatment but may recur. Also common in nutritional deficiency, e.g. of B vitamins.	Not required.
Recurrent oral ulcerations occurring twice or more in six months	Aphthous ulceration, typically with a halo of inflammation and a yellow-grey pseudomembrane.	Not required.
Papular pruritic eruptions	Papular pruritic vesicular lesions. Also common in uninfected adults. Note: scabies and obvious insect bites should be excluded.	Not required.
Seborrhoeic dermatitis	Itchy scaly skin condition, particularly affecting scalp, face, upper trunk and perineum. Also common in uninfected adults.	Not required.
Fungal nail infections of fingers	Fungal paronychia (painful red and swollen nail bed) or onycholysis (separation of the nail from the nail bed) of the fingernails. Also common in uninfected adults. Proximal white subungual onychomycosis is uncommon without immunodeficiency.	Not required but confirmed by culture of nail scrapings.

<b>Clinical Stage 3</b>		
Severe unexplained weight loss (more than 10% of presumed or measured body weight)	Reported weight loss without trying, and noticeable thinning of face, waist and extremities.	Documented loss of more than 10% of body weight.
Unexplained chronic diarrhoea for longer than one month	Chronic diarrhoea (loose or watery stools three or more times daily) reported for longer than one month.	Not required but confirmed if three or more stools observed and documented as and two or more stool tests reveal no pathogens on microscopy and culture and no faecal leukocytes.
Unexplained persistent fever (intermittent or constant and for longer than one month)	Reports of fever or night sweats for more than one month, either intermittent or constant with reported lack of response to antibiotics or antimalarials. No other obvious foci of disease reported or found on examination. Malaria must be excluded in malarious areas.	Not required but confirmed if documented fever >37.5 °C with negative blood culture, negative Ziehl-Nielsen (ZN) stain, negative malaria slide, normal or unchanged chest X-ray (CXR) and no other obvious foci of disease.
Oral candidiasis	Creamy white to yellow soft small plaques on red or normally coloured mucosa which can often be scraped off (pseudomembranous), or red patches on tongue, palate or lining of mouth, usually painful or tender (erythematous form), responding to antifungal treatment.	Not required.
Oral hairy leukoplakia	Fine small linear patches on lateral borders of the tongue, generally bilaterally, which do not scrape off	Not required.
Pulmonary TB (current or in last two years)	Chronic (symptoms lasting three or more weeks) productive cough, haemoptysis, shortness of breath, weight loss, fever, night sweats and fatigue, no resolution of symptoms with standard broad-spectrum antibiotics, positive ZN stain. Response to standard anti-TB treatment in one month. <b>Note:</b> TB diagnosis and treatment should follow national or international guidelines. CD4+ should be used where possible to guide therapy; very low CD4 may require urgent ART.	Not required but confirmed by positive sputum culture.
Severe presumed bacterial infection (e.g. pneumonia, meningitis, empyema, pyomyositis, bone or joint infection, bacteraemia)	Fever accompanied by specific symptoms or signs that localize infection, and response to antibiotic.	Not required but confirmed by bacteria isolated from appropriate clinical specimens.
Acute necrotizing ulcerative gingivitis or necrotizing ulcerative periodontitis	Severe pain, ulcerated gingival papillae, loosening of teeth, spontaneous bleeding, bad odour, and rapid loss of bone and/or soft tissue.	Not required.
Unexplained anaemia (<8g/dl), neutropenia (<1000/mm <sup>3</sup> ) or thrombocytopenia (<50 000/mm <sup>3</sup> ) for more than one month	No presumptive clinical diagnosis.	Diagnosed on laboratory testing and not explained by other non-HIV conditions. Not responding to standard therapy with haematinics, antimalarials or anthelmintics as outlined in relevant national treatment guidelines, WHO IMCI guidelines or other relevant guidelines.
<b>Clinical Stage 4</b>		
HIV wasting syndrome	Unexplained weight loss greater than 10% of body weight and visible thinning of face, waist and extremities; plus either unexplained chronic diarrhoea (lasting more than one month) or unexplained prolonged or intermittent fever for one month or more.	Confirmed by documented weight loss without trying; plus documented unformed stools negative for pathogens; negative for modified ZN; or Documented temperature of 37.5°C or more on occasions with no obvious foci of disease, negative blood culture, negative malaria slide and normal or unchanged CXR.
Pneumocystis pneumonia	Dry cough, progressive shortness of breath, especially on exertion, with cyanosis, tachypnoea and fever, response to high-dose co-trimoxazole +/- prednisolone. Bilateral crepitations on auscultation with or without reduced air entry. CXR usually shows typical bilateral interstitial infiltrate with bat wing appearance.	Not required but confirmed by: microscopy of induced sputum or bronchoalveolar lavage (BAL), or histology of lung tissue.
Recurrent severe or	Two episodes of fever, wet cough, fast and	Not required but confirmed by culture or

radiological bacterial pneumonia (two or more episodes within one year) Chronic herpes simplex virus (HSV) infection (orolabial, genital or anorectal of more than one month, or visceral of any duration) Oesophageal candidiasis	difficult breathing and chest pain. Consolidation on clinical examination and CXR. Response to antibiotics. Severe and progressive painful orolabial, genital, or anorectal lesions caused by recurrent HSV infection reported for more than one month. History of previous episodes. Scarring from previous episodes may be evident.  Chest pain and dysphagia (difficulty in swallowing), odynophagia (pain on swallowing food and fluids), or retrosternal pain worse on swallowing (food and fluids) +/- oral <i>Candida</i> . Responds to antifungal treatment. Systemic illness usually with prolonged fever, night sweats, weakness and weight loss.	antigen test from appropriate specimen.  Not required for mucocutaneous HSV but required for visceral HSV. Suggestive symptoms of organ damage, e.g. bronchitis, pneumonitis, oesophagitis, colitis, encephalitis, supported by histology or culture. Not required but confirmed by macroscopic appearance at endoscopy or bronchoscopy, microscopy or histology.
Extrapulmonary/ disseminated TB	Systemic illness usually with prolonged fever, night sweats, weakness and weight loss. Clinical features of organs involved, e.g. focal lymphadenopathy, cold abscess, sterile pyuria, pericarditis, ascites, pleural effusion, meningitis, arthritis, orchitis, lupus vulgaris. CXR may reveal diffuse uniformly distributed small miliary shadows Response to standard anti-TB treatment in one month.	Not required but confirmed by acid-fast bacilli (AFBs) seen in microscopy of (cerebrospinal fluid (CSF), effusion, lymph node aspirate, urine, etc. Mycobacteria TB isolated from blood culture or any appropriate specimen except sputum or BAL. Histology (e.g. pleural or pericardial biopsy). CXR may show interstitial infiltrates. Lymphocytic CSF with typical abnormalities, no bacterial growth and negative cryptococcal antigen (CRAG). Not required but confirmed by :
Kaposi's sarcoma	Typical appearance in skin or oropharynx of persistent, initially flat, patches with a pink or blood-bruise colour, skin lesions that usually develop into nodules. Can be confused clinically with bacillary angiomatosis, non-Hodgkin lymphoma and cutaneous fungal or bacterial infections.	- typical red-purple lesions seen on bronchoscopy or endoscopy; - dense masses in lymph nodes, viscera or lungs by palpation or radiology; - histology.
CMV (retinitis or CMV infection of an organ other than liver, spleen or lymph nodes)	Retinitis only.  CMV retinitis may be diagnosed by experienced clinicians. Progressive floaters in field of vision, light flashes and scotoma. Typical eye lesions on serial fundoscopic examination; discrete patches of retinal whitening with distinct borders, spreading centrifugally, often following blood vessels, associated with retinal vasculitis, haemorrhage and necrosis.	- typical red-purple lesions seen on bronchoscopy or endoscopy; - dense masses in lymph nodes, viscera or lungs by palpation or radiology; - histology.
CNS toxoplasmosis	Fever, headache, focal neurological signs, convulsions. Rapid response (within 10 days) to high-dose co-trimoxazole, or pyrimethamine and sulphadiazine or clindamycin.	Definitive diagnosis required for other sites. Symptoms and signs of other organ involvement, e.g. pneumonitis, pancreatitis, colitis, cholecystitis, not responding to co-trimoxazole or antibiotics. Histology. CSF polymerase chain reaction (PCR). Not required but confirmed by computed tomography (CT) scan showing single/multiple lesions with mass effect/enhancing with contrast. If lumbar puncture (LP) performed, CSF nonspecific or normal. Resolution of findings after treatment if patient survives.
Cryptococcal meningitis or other extrapulmonary <i>Cryptococcus</i> infection	Meningitis: usually subacute, fever with increasing severe headache, meningism, confusion, behavioural changes. Responds to antifungal therapy.	Confirmed by CSF microscopy (India ink or Gram stain). Serum or CSF CRAG-positive or culture-positive.
HIV encephalopathy	Clinical finding of disabling cognitive and/or motor dysfunction interfering with activities of daily living, progressing over weeks or months in the absence of a concurrent illness or condition other than HIV infection which might explain the findings. LP should be conducted to exclude other infectious causes.	Recommended to confirm clinical features and exclude other causes including neurosyphilis: - brain scan by means of CT or magnetic resonance imaging (MRI) with - LP.
Disseminated	No presumptive diagnosis.	Nonspecific clinical symptoms including

non-tuberculous mycobacteria infection		progressive weight loss, fever, anaemia, night sweats, fatigue or diarrhoea. Severe anaemia and/or elevated alkaline phosphatase and/or (in case of diarrhoea) persisting AFB in the stool in spite of TB therapy. Plus: Culture of atypical mycobacteria species from stool, blood, body fluid or other body tissue, excluding lung.
PML	No presumptive diagnosis.	Progressive focal neurological signs without
Candidiasis of trachea, bronchi, lungs	No presumptive diagnosis.	headache or fever, cortical blindness, cerebellar signs, dementia. Confirmed by consistent MRI or CT scan, and biopsy. Viral PCR for Jacob Creutzfeldt virus. Confirmed by symptoms, clinical signs
Cryptosporidiosis (with diarrhoea lasting more than one month)	No presumptive diagnosis.	suggestive of organ involvement and/or macroscopic appearance at bronchoscopy. Histology or cytology, or microscopy of specimen from tissue.
Isosporiasis	No presumptive diagnosis.	Chronic diarrhoea, often profuse and watery, with weight loss, ± abdominal pain, nausea, vomiting; confirmed by modified ZN microscopic examination of stool. Stools observed to be unformed with organism visualized in stool sample. Watery diarrhoea, cramps and weight loss.
Any disseminated mycosis (e.g. coccidiomycosis, histoplasmosis, penicilliosis)	No presumptive diagnosis.	Symptoms usually indistinguishable from those of cryptosporidiosis. Isosporiasis responds to high-dose cotrimoxazole. Clinical symptoms nonspecific, e.g. skin rash, cough, shortness of breath, fever, anaemia, weight loss. CXR: infiltrates or nodules. Confirmed by direct microscopy, Histology: usually granuloma formation. Isolation: antigen detection from affected tissue. Skin lesion culture or microscopy positive.
Recurrent non-typhoidal salmonella septicaemia (two or more episodes in last year)	No presumptive diagnosis.	Nonspecific symptoms: fever, sweats, headaches, weight loss, diarrhoea and anorexia. Confirmed by blood culture.
Lymphoma (cerebral or B cell non-Hodgkin)	No presumptive diagnosis.	Symptoms consistent with lymphoma: lymphadenopathy, splenomegaly, pancytopenia, testicular or lung mass lesions; no response clinically to antitoxoplasma or anti-TB treatment. CNS imaging: at least one lesion with mass effect on brain scan; histology. Persistent vaginal discharge, postcoital or intermenstrual bleeding unresponsive to appropriate antibacterial or antifungal treatment; cervical lesions visualized. Histology. Cytology, but not carcinoma in situ.
Invasive cervical carcinoma	No presumptive diagnosis.	
Visceral leishmaniasis	No presumptive diagnosis.	
	Suggestive symptoms: malaise, chronic fever, hepatosplenomegaly, pancytopenia. Amastigotes visualized or cultured from any appropriate clinical specimen.	

## Clinical staging events as a tool to guide clinical management in adults and adolescents (pre-ART and ART follow-up care)

The same criteria for presumptive and definitive diagnosis apply

Clinical events pre-ART	Action
Stage 1	No action required
Stage 2	Requires cotrimoxazole
Stage 3 Or Stage 4	Requires cotrimoxazole if not already started Consider ART First ever occurrence of a stage 3 or 4 event requires notification for surveillance purposes
Clinical events on ART	Action
Stage 1	Consider interruption of cotrimoxazole
New or recurrent :  Stage 2 or stage 3	Check adherence Treat and manage condition Restart cotrimoxazole Should alert the provider to the possibility of poor adherence or failing response to treatment.
New or recurrent  Stage 4	Check adherence Treat and manage condition Restart cotrimoxazole Consider regimen switch Suggest failure to respond to ART, possibly because of true failure of the regimen and/or poor adherence.

## Revised WHO clinical staging for infants and children: presumptive and definitive criteria for recognizing HIV and AIDS-related clinical events (for Table 9.1)

For use in infants and children aged under 15 years with laboratory evidence of HIV infection: HIV antibody in those aged 18 months and above, DNA or RNA virological testing or P24 antigen testing for those aged under 18 months.

Highlighted events are still awaiting further data for clarification of definitions

Clinical event	Presumptive diagnosis	Definitive diagnosis
<b>Clinical Stage 1</b>		
Asymptomatic	No symptoms reported and no signs on Not required.	examination.
PGL	Swollen or enlarged lymph nodes >1 cm at two or more non-contiguous sites, without known cause.	Not required. (Histology; germinal centre hyperplasia, lymph node structure preserved.)
<b>Clinical Stage 2</b>		
Hepatosplenomegaly	Unexplained enlarged liver or spleen.	Not required.
Papular pruritic eruptions	Persistent papular pruritic vesicular lesions; scabies should be excluded.	Not required.
Seborrhoeic dermatitis	Itchy scaly skin condition particularly affecting scalp, face, upper trunk and perineum. Also common in uninfected children and in babies.	Not required.
Fungal nail infections	Fungal paronychia (painful, red and swollen nail bed) or onycholysis (painless separation of the nail from the nail bed). Proximal white subungual onchomycosis is uncommon without immunodeficiency.	Culture of nail scrape.
Angular cheilitis	Splits or cracks on lips at the angle of the mouth with depigmentation, usually responding to antifungal treatment but may recur. Also common in nutritional deficiency, e.g. of B vitamins.	Not required.
LGE	Erythematous band that follows the contour of the free gingival line; may be associated with spontaneous bleeding. Uncommon in HIV-uninfected children.	Not required.
Human papilloma virus infection(extensive facial, more than 5% of body area or disfiguring)	Characteristic skin lesions; warts; small fleshy grainy bumps, often rough, on sole of feet are flat (plantar warts). Also common in uninfected children.	Not required.
Molluscum contagiosum infection (extensive facial, more than 5% of body area or disfiguring)	Characteristic skin lesions: small flesh-coloured, pearly or pink, dome-shaped or umbilicated growths, may be inflamed or red. Also common in uninfected children.	Not required.
Recurrent oral ulcerations (two or more in six months)	Aphthous ulceration, typically with a halo of inflammation and a yellow-grey pseudomembrane.	Not required.
Parotid enlargement	Asymptomatic bilateral swelling that may spontaneously resolve and recur, in absence of other known cause, usually painless. Uncommon in HIV-uninfected children.	Not required.
Herpes zoster	Painful rash with fluid-filled blisters, dermatomal distribution, can be haemorrhagic on erythematous background, and can become large and confluent. Does not cross the midlines. <b>Note:</b> severe persistent herpes zoster may have worse prognosis.	Viral culture, histology, EM of lesion fluid
Recurrent URTI (otitis media, otorrhoea or sinusitis) twice or more in any six-month period	Symptoms complex, e.g. fever with unilateral face pain and nasal discharge (sinusitis) or painful swollen eardrum (otitis media), sore throat with productive cough ( bronchitis), sore throat (pharyngitis) and barking croup-like cough (LTB). Persistent or recurrent ear discharge.	Not required but may be confirmed by laboratory or X-ray studies where available, especially for sinus, and culture or appropriate specimens.

Clinical Stage 3		
Unexplained moderate malnutrition (very low weight-for-age: up to – 2 standard deviations (SDs) (3, 4); not responding adequately to standard therapy,	Unexplained weight loss not explained by poor or inadequate feeding or other infections, and not adequately responding within two week to standard management,	Documented loss of body weight, failure to gain weight on standard management and no other cause identified during investigation.
Unexplained persistent diarrhoea (14 days and above)	Unexplained persistent diarrhoea (loose or watery stool, three or more times daily), not responding to standard treatment.	Not required, but confirmed if stools observed and documented as unformed. Culture and microscopy reveal no pathogens.
Unexplained persistent fever (intermittent or constant and for longer than one month)	Reports of fever or night sweats for longer than one month, either intermittent or constant, with reported lack of response to antibiotics or antimalarials. No other obvious foci of disease reported or found on examination. Malaria must be excluded in malarious areas.	Not required but confirmed if documented fever of >37.5 °C with negative blood culture, negative malaria slide and normal or unchanged CXR, and no other obvious foci of disease.
Oral candidiasis (outside neonatal period )	Persistent creamy white to yellow soft small plaques on red or normally coloured mucosa, easily scraped off (pseudomembranous), or red patches on tongue, palate or lining of mouth, usually painful or tender, responding to antifungal treatment.	Microscopy or culture.
Oral hairy leukoplakia	Fine small linear patches on lateral borders of tongue, generally bilaterally, which do not scrape off	Not required.
Pulmonary TB	Nonspecific symptoms, e.g. chronic cough, fever, night sweats, anorexia and weight loss. In the older child also productive cough and haemoptysis. Response to standard anti-TB treatment in one month. <b>Note:</b> diagnosis should be made in accordance with national guidelines.	Abnormal CXR plus positive
Severe recurrent presumed bacterial pneumonia	Cough with fast breathing, chest indrawing, nasal flaring, wheezing, and grunting. Crackles or consolidation on auscultation. Responds to course of antibiotics.	Not required but confirmed by isolation of bacteria from appropriate clinical specimens.
Acute necrotizing ulcerative gingivitis or stomatitis, or acute necrotizing ulcerative	Severe pain, ulcerated gingival papillae, loosening of teeth, spontaneous bleeding, bad odour, and rapid loss of bone and/or periodontitis soft tissue.	Not required.
LIP	No presumptive clinical diagnosis.	CXR: bilateral reticulonodular interstitial pulmonary infiltrates present for more than two months with no response to antibiotic treatment and no other pathogen found. Oxygen saturation persistently <90%. May present with cor pulmonale and may have increased exercise-induced fatigue. Frequently confused with miliary TB.
Chronic HIV-associated lung disease (including bronchiectasis)	No presumptive clinical diagnosis.	History of cough productive of copious amounts of purulent sputum, with or without clubbing, halitosis, and crepitations and/or wheezes on auscultation; CXR may show honeycomb appearance (small cysts) and/or persistent areas of opacification and/or widespread lung destruction, with fibrosis and loss of volume. CT scan of chest may be used to confirm.
Unexplained anaemia (<8g/dl), and or neutropenia (<1000/mm <sup>3</sup> ) and or thrombocytopenia (<50 000/ mm <sup>3</sup> ) for longer than one month	No presumptive clinical diagnosis.	Diagnosed on laboratory testing, not explained by other non-HIV conditions, or not responding to standard therapy with haematinics, antimalarials or anthelmintics as outlined in IMCI.

Clinical Stage 4		
Unexplained severe wasting or severe malnutrition not adequately responding to standard therapy	Persistent weight loss not explained by poor or inadequate feeding, other infections and not adequately responding in two weeks to standard therapy. Characterized by: visible severe wasting of muscles, with or without oedema of both feet, and/or weight-for-height of $-3$ SDs, as defined by WHO IMCI guidelines.	Documented weight loss without trying.
Pneumocystis pneumonia (PCP)	Dry cough, progressive shortness of breath, cyanosis, tachypnoea and fever; chest indrawing or stridor. Response to high-dose co-trimoxazole +/- prednisolone. (Severe or very severe pneumonia as in IMCI). Usually of sudden onset and very severe in infants under six months of age .	Microscopy of induced sputum or BAL, or histology of lung tissue. CXR shows typical bilateral perihilar diffuse infiltrates.
Recurrent severe presumed bacterial infection (two or more episodes in one year) e.g. meningitis, empyema, pyomyositis, bone or joint infection, bacteraemia	Fever accompanied by specific symptoms or signs that localize infection. Responds to antibiotics.	Not required but confirmed by bacteria isolated from appropriate clinical specimens and includes recurrent non-typhoidal salmonella septicaemia.
Chronic herpes simplex virus infection (chronic orolabial or intraoral lesions of more than one month or visceral of any duration)	Severe and progressive painful orolabial or skin lesions attributable to recurrent HSV reported for more than one month. History of previous episodes Scarring from previous episodes may be evident.	Visceral HSV requires confirmation. Suggestive symptoms of organ damage, e.g. bronchitis, pneumonitis, oesophagitis, colitis, encephalitis, supported by histology or culture.
Oesophageal candidiasis	Chest pain and dysphagia (difficulty in swallowing) odynophagia (pain on swallowing food and fluids), or retrosternal pain worse on swallowing (food and fluids) +/- oral <i>Candida</i> . Responds to antifungal treatment. May be difficult to detect in young children. Suspect if oral <i>Candida</i> observed and if refusal occurs or if there are difficulties or crying when feeding.	Not required but confirmed by macroscopic appearance at endoscopy, microscopy of specimen from tissue or macroscopic appearance at bronchoscopy or histology.
Extrapulmonary TB	TB not limited to lungs. Systemic illness usually with prolonged fever, night sweats, weight loss. Clinical features of organs involved, e.g. focal lymphadenopathy, cold abscess, sterile pyuria, pericarditis, ascites, pleural effusion, meningitis, arthritis, orchitis, lupus vulgaris. <b>Note:</b> simple lymph gland extrapulmonary TB may have a better prognosis.	Responds to standard anti-TB therapy. Mycobacterium TB isolated from blood culture or other specimen except sputum or BAL. Positive AFB on microscopy or culture on relevant specimens. Biopsy and histology. X-ray.
Kaposi's sarcoma	Typical appearance in skin or oropharynx, initially flat patches with a pink or blood-bruise colour, usually developing into nodules.	Typical red-purple lesions seen on bronchoscopy or endoscopy. Biopsy.
CMV retinitis and CMV infection of organs other than liver, spleen or lymph nodes, with onset at age over 1 month	No presumptive clinical diagnosis. Clinically, disease suspected if there are typical eye lesions on serial fundoscopic examination; discrete patches of retinal whitening with distinct borders, spreading centrifugally, often following blood vessels, associated with retinal vasculitis, haemorrhage and necrosis.	Symptoms and signs of organ involvement, e.g. typical eye lesions on fundoscopy or pneumonitis not responding to co-trimoxazole or antibiotics. Histology or detection of antigen from affected tissue.
CNS toxoplasmosis (outside the neonatal period)	Fever, headache, focal neurological signs, convulsions. Response to high-dose co-trimoxazole or pyrimethamine and sulphadiazine or clindamycin.	CT scan showing single/multiple lesions with mass effect/enhancing with contrast. CSF results normal or nonspecific. Resolution of findings after treatment if patient survives.
Cryptococcal meningitis	Meningitis: usually subacute, fever with increasing severe headache, irritability, meningism, confusion, behavioural changes. Responds to antifungal therapy	CSF: microscopy (India ink or Gram stain) Positive serum CRAG test.

HIV encephalopathy	At least one of the following, progressing over at least two months in the absence of another illness: - failure to attain, or loss of, developmental milestones, loss of intellectual ability; or - progressive impaired brain growth demonstrated by stagnation of head circumference; or - acquired symmetric motor deficit accompanied by two or more of the following: paresis, pathological reflexes, ataxia, gait disturbances.	Brain CT scan or MRI to exclude other causes.
Any disseminated mycosis (e.g. histoplasmosis, coccidiomycosis, penicilliosis)	No presumptive clinical diagnosis.	Organ-specific and nonspecific symptoms, e.g. may cause skin rash, or cough, shortness of breath, fever, anaemia, weight loss. Diagnosis confirmed by direct microscopy, histology or antigen detection in relevant specimens. CXR may show infiltrates or nodules.
Candidiasis of the trachea, bronchi or lungs	No presumptive clinical diagnosis.	Macroscopic appearance at endoscopy. Microscopy and culture of specimen from endoscopic tissue.
Disseminated mycobacteriosis, other than TB	No presumptive clinical diagnosis.	Nonspecific clinical symptoms including progressive weight loss, fever, anaemia, night sweats, fatigue or diarrhoea; plus culture of atypical mycobacteria species from stool, blood, body fluid or other body tissue, excluding lung.
Cryptosporidiosis (with diarrhoea lasting more than one month)	No presumptive clinical diagnosis.	Chronic diarrhoea, often profuse and watery, with weight loss, ± abdominal pain, nausea, vomiting, but usually mild or no fever. Confirmed by microscopic examination on modified ZN stain.
Isosporiasis	No presumptive clinical diagnosis.	Chronic diarrhoea, often profuse and watery, with weight loss, ± abdominal pain, nausea, vomiting. Isosporiasis responds to high-dose co-trimoxazole.
Cerebral or B cell non-Hodgkin lymphoma	No presumptive clinical diagnosis.	Symptoms consistent with lymphoma: lymphadenopathy, hepatosplenomegaly, pancytopenia, besides other nonspecific or organ-specific symptoms. No response clinically to antitoxoplasma or anti-TB treatment. CNS imaging: at least one lesion with mass effect on brain scan, and no response to antitoxoplasma and anti-TB treatment. Cytology. Histology. Response to chemotherapy.
PML	No presumptive clinical diagnosis.	Progressive focal neurological signs without headache or fever. Cortical blindness and cerebellar signs. Convulsions are rare. MRI or CT scan
Acquired HIV-associated rectal fistula, including rectovaginal fistula		Further information and evidence relating to this condition and its definition are being sought. Case reports from African countries suggest that it is highly specific to HIV and that the prognosis is poor. Clinical features suggestive, exclusion of other causes, faecal discharge through the vagina or urethra, or urine discharge through the rectum in an HIV-infected child usually following an episode of diarrhoea.

HIV-associated nephropathy	No presumptive clinical diagnosis.	Further information and evidence relating to this condition and its definition are being sought. Symptoms and signs suggestive of renal disease, with no other obvious cause identified. Early morning urine protein/creatinine ratio of >200mg/mmol in absence of a urinary tract infection and absence of an axillary temperature of 38.0 °C. Renal biopsy and histology.
HIV-associated cardiomyopathy	No presumptive clinical diagnosis.	Further information and evidence relating to this condition and its definition are being sought. Exclusion of other causes of congestive cardiac failure. The left ventricle and right ventricle are enlarged. The end-diastolic and end-systolic dimensions of the left or right ventricle are increased (2 SDs from the mean for body surface area), with a reduced fractional shortening and ejection fraction (2 SDs from the mean). Echocardiography check.

### Clinical staging events as a tool to guide clinical management for infants and children (pre-ART and ART follow-up care)

The same criteria for presumptive and definitive diagnosis apply

Clinical events pre-ART	Action
Stage 1	May require cotrimoxazole
Stage 2	Requires cotrimoxazole
Stage 3	Requires cotrimoxazole if not already started
Or Stage 4	Consider ART Notification for surveillance purposes of first ever occurrence of a stage 3 or 4 events
Clinical events on ART	Action
Stage 1	Currently not advised to discontinue cotrimoxazole in children under 5 years
New or recurrent : Stage 2 or stage 3	Check adherence, provide support Treat and manage condition Should alert the provider to the possibility of poor adherence or failing response to treatment.
New or recurrent Stage 4	Check adherence, provide support Treat and manage condition Consider ART regimen switch Suggests failure to respond to ART, possibly because of true failure of the regimen and/or poor adherence.

## ARV DOSAGE RECOMMENDATIONS: Tanzania 1st and 2nd Line ARV Regimens and Cotrimoxazole Prophylaxis (CPT)

## NRTI (Nucleoside analogues)

DRUG	PRODUCT	BRAND	STRENGTH	DOSE	SPECIAL CONSIDERATIONS	SIDE EFFECTS
AZT	Zidovudine (ZDV)	Retrovir	100 mg caps 300 mg tab 10 mg/mL	Pediatric dose: 240 mg/m <sup>2</sup> /dose bd Adoles: 200 mg/dose q 12 hrs Adult: 300 mg/dose q 12 hrs	Do NOT use AZT with ddT Take with / without food	Anemia, neutropenia G intolerance, headache, myalgia Fingernail discoloration
3TC	Lamivudine	Epivir	150 mg tab 10 mg/mL	Pediatric dose: 4mg/kg/dose q 12 hr up to max dose 150mg dose q 12 hr	Can cut or crush tablets. Take with / without food Can use Duovir/Combivir (AZT 300/3TC 150) in adults >40 kg Duovir/Combivir tablets should not be split	Few side effects G intolerance, headache Rare : pancreatitis, peripheral neuropathy
ABC	Abacavir	Ziagen	300 mg tab 20 mg/ml	Pediatric dose: 8 mg/kg/dose q 12 hrs Adult: 300 mg/dose q 12 hrs	Take with / without food Hypersensitivity: Must stop immediately and never re-start Rare (<3%) but can be fatal	Contraindicated if previous hypersensitivity: Symptoms include: Abdominal pain, diarrhea, fever, nausea, fatigue, malaise, lethargy, edema, myalgia, arthralgia, cough, shortness of breath, pharyngitis, parosmia, rash,
ddl	Didanosine	Videx	25, 50, 100 and 200 mg tabs 10 mg/ml	Pediatric dose: 90-150 mg/m <sup>2</sup> /dose q 12 hr Adoles choose: 120 mg/m <sup>2</sup> /dose q 12 hr Adoles/Adult: <60kg:125 mg/dose q12 hr OR 250 to 300 mg/dose OD >60 kg:200 mg/dose q12hr OR 400 mg/dose OD	Administer on empty stomach : 1h before or 2h after meal Don't take with acidic drinks (such as fruit juice) but can take with water For proper buffer dose, MUST take 2 or more caps Do not give ddi AND ddT to pregnant women	G intolerance Peripheral neuropathy Pancreatitis
ddT	Stavudine	Zerit	15, 20, 30 and 40 mg caps 1 mg/mL	Pediatric dose: 1 mg/kg/dose q 12 hr Adult dose: <60kg: 30mg/dose q 12 hr >60kg: 40mg/dose q 12 hr	Take with / without food Capsules can be opened Do NOT use ddT with AZT Do not give ddi AND ddT to pregnant women	Pancreatitis, peripheral neuropathy (more frequent if combined with dd ) Headache, G intolerance increase in liver enzymes
Not all formulations available						

## NNRTI (Non-nucleoside reverse transcriptase inhibitors)

DRUG	PRODUCT	BRAND	STRENGTH	DOSE	SPECIAL CONSIDERATIONS	SIDE EFFECTS
NVP	Nevirapine	Viramune	200 mg tab 10 mg/1mL	Peds 120 mg/m <sup>2</sup> /dose OD X 2 wks Then Increase, if LFT's OK, to 200 mg/m <sup>2</sup> /dose q 12 hr <b>NOTE new dosing based on BSA with no age changes</b>	Take with/without food Start with low dose for 14 days to help prevent rash Stop if severe rash or involvement of mucous membranes Caution with rifampicin	Skin rash (usually at day 7-14 but up to 8 weeks) Hepatitis (usually first 12 weeks) Hypersensitivity reaction can occur even up to 6 mos
Triumune 30 or 40 contains dd4 30 or 40 mg, 3TC 150 mg, and NVP 200g If body weight < 60 kg use Triumune 30 If body weight > 60 kg use Triumune 40				<b>Maximum dose always 200 mg/dose</b> Adult dose: 200mg/dose OD X 2 wks Then Change, if LFT's OK, to: 200 mg/dose q 12hr	Do NOT increase dose with mild non-systemic rash Women: f on triple ART with NVP and baseline CD4 > 200, check SGPT at week 2 and q 4 weeks for first 6 months ONLY for Children > Age 3 years	Most NVP hypersensitivity reactions occur within 8 wks of starting NVP Women with baseline CD4 > 200 have significantly higher risk of fatal hepatic toxicity when on NVP triple ART
EFV	Efavirenz	Stocrin	50, 100 and 200 mg caps 600 mg tabs	Pediatric dose: Single dose qhs: 10-14 kg: 200 mg/dose qhs, 15-19 kg: 250 mg/dose qhs, 20-24 kg: 300 mg/dose qhs, 25-32.5 kg: 350 mg/dose qhs 32.5-40 kg: 400mg qhs Adult dose: >40 kg: 600 mg/dose qhs (800 mg qhs with rifampicin if Body weight > 60 kg)	Bedtime-dosing is recommended Can open capsules and mix with food or water Do not take with fatty meal Do not use during pregnancy (teratogenicity) Concurrent use with Rifampicin is possible but EFV dose may need an increase by 25% (800 mg EFV in adults)	Skin rash Central nervous system (usually present during first 14 days) increase in liver enzymes Rare: hepatitis
Not all formulations available						

## PI (Protease inhibitors)

DRUG	PRODUCT	BRAND	STRENGTH	DOSE	SPECIAL CONSIDERATIONS	SIDE EFFECTS
NFV	Nelfinavir	Viracept	250 mg tab Powder 50 mg/ level scoop	Pediatric dose: 20-55 mg/kg/dose q 8hr to q 12 hr Adoles choose: 55 mg/kg/dose q 12 hr Adult dose: 1250 mg q 12 hr	Can break in half, crush and mix with food or drink Do not use with Rifampicin	Diarrhea is common but can often be treated with symptomatic care
LPV/RTV	Lopinavir / Ritonavir	Kaletra	single cap: LPV/RTV 133.3/33.3 mg Dosed on LPV	Peds(6 mos-12 yrs) if 7- < 15 kg: 12 mg LPV/kg/dose q12 hrs if 15-40 kg 10 mg LPV/kg/dose q 12 hrs Adults: 3caps/dose q 12hrs (max dose 400 mg LPV (> 40kg))	Better absorbed and tolerated if taken with food See ARV Guidelines if using with NVP/EFV for higher dose Must take with food Peds Solution contains alcohol Store at room temperature Need higher dose with rifampicin	Asihenia, body aches, abdominal pain, diarrhea, nausea, vomiting, rash, headache, insomnia
Susp: 80/20 mg/ml: Dosed on LPV						

## Cotrimoxazole Prophylaxis

DRUG	PRODUCT	BRAND	STRENGTH	DOSE	SPECIAL CONSIDERATIONS	SIDE EFFECTS
TMP-SMX	Cotrimoxazole	TMP-SMZ	TMP 40mg/5mL	Peds dose : 6 - 8 mg/kg/day (of TMP) divided bd TMP/SMZ correct dosing based on 150 mg/m <sup>2</sup> /day of TMP while chart uses an estimate of 5 mg/kg/day TMP Peds doses: > 6 weeks of age: given daily for better prevention of PCP bacterial pneumonia/respiratory infections, diarrhoeal illnesses, cerebral toxoplasmosis and skin infections Adults: 1 DS tab OD or 2 SS daily for prevention of PCP bacterial pneumonia/respiratory infections, diarrhoeal illnesses	Use after age 4- 6 weeks until age 12 mos if mother H IV+ Stop if baby proven H V negative or if CD4% > 15% after age 12 months in H V+ child	Rash Myelosuppression, pancreatitis, emesis
Single Strength (SS) TMP 80 mg / SMX 400 mg Double Strength (DS) TMP 160 mg / SMX 800 mg						

ARV - DRUGS DOSE RANGES: Tanzania 1st and 2nd Line ARV Regimens and Cotrimoxazole Prophylaxis (CPT)

1st Line ARV's

Drug	Product	Strength	DOSE	3-5 kg	5-10 kg	10-15 kg	15-20 kg	20-25 kg	25-30 kg	30-40 kg	40-50 kg	50-60 kg	>60 kg
AZT	Average Dose ranges based on BSA estimations			100 mg cap	2X 100 mg caps	2X 100 mg caps	MAX dose 200 mg q 12 hr for adolescents until > 40 kg, full dose 300 mg q 12 hrs	2x 100 mg caps	2x 100 mg caps	2 X 100 mg caps 12 hrly	300 mg tab 12 hrly	300 mg tab 12 hrly	300 mg tab 12 hrly
	Zidovudine	100 mg caps, 300 mg tabs	240 mg/m <sup>2</sup> /dose 12 hrly	q12hr OR 5.8 mL to 11.5 mL 12 hrly	q 12 hr OR 9.2 mL to 16.8 mL 12 hrly	q 12 hr OR 12.7 mL to 19.4 mL 12 hrly	2x-100 mg caps OR 20 mL 12 hrly	2x-100 mg caps OR 20 mL 12 hrly	2 X 100 mg caps 12 hrly	300 mg tab 12 hrly	300 mg tab 12 hrly	300 mg tab 12 hrly	300 mg tab 12 hrly
3TC	Lamivudine	150 mg tab	Peds: 4 mg/kg/dose 12 hrly	2.0 mL to 4.0 mL 12 hrly	4.0 mL to 8.0 mL 12 hrly	8.0 mL to 15.0 mL 12 hrly	10 mL to 12 mL 12 hrly	10 mL to 12 mL 12 hrly	10 mL to 12 mL 12 hrly	1 tab 12 hrly	1 tab 12 hrly	1 tab 12 hrly	1 tab 12 hrly
	Epirvir	10 mg/mL		2.0 mL to 4.0 mL 12 hrly	4.0 mL to 8.0 mL 12 hrly	8.0 mL to 15.0 mL 12 hrly	10 mL to 12 mL 12 hrly	10 mL to 12 mL 12 hrly	10 mL to 12 mL 12 hrly	1 tab 12 hrly	1 tab 12 hrly	1 tab 12 hrly	1 tab 12 hrly
NVP	Peds: Start 120 mg/m <sup>2</sup> /dose OD X 2 wks, then 200 mg/m <sup>2</sup> /dose q 12 hr			Average Dose ranges based on BSA estimations									
	Nevirapine	200 mg tabs	First 2 weeks 3.3 mL OD	2.9 mL to 5.7 mL OD	4.6 mL to 8.4 mL OD	6.3 mL to 9.7 mL OD	7.7 mL to 12.8 mL to 15.4 mL to 1 tab 12 hrly	9.2 mL to 14.3 mL OD	15.4 mL to 1 tab 12 hrly	Adults: Trimmune: start with 1 Trimmune tab in AM and d4/3TC 12 hours later in PM for 2 weeks. After 2 weeks, then Trimmune only: 1 tab q 12 hr			
	Viramune	10 mg/mL	After 2 weeks 3.6 mL to 5.6 mL 12 hrly	4.8 mL to 9.6 mL 12 hrly	7.7 mL to 14 mL 12 hrly	10.6 mL to 16.2 mL 12 hrly	12.8 mL to 1 tab 12 hrly	15.4 mL to 1 tab 12 hrly	1 tab 12 hrly	1 tab (200 mg) OD for first 2 weeks then 1 tab (200 mg) q 12 hr			
d4T	Stavudine	15, 20, 30, and 40 mg caps	1 mg/kg/dose 12 hrly	3 mL to 5 mL 12 hrly	5 mL to 10 mL 12 hrly	15 mg cap OR 20 mg cap 12 hrly	15 mg cap OR 20 mg cap 12 hrly	20 mg cap 12 hrly	30 mg cap 12 hrly	30 mg cap 12 hrly	30 mg cap 12 hrly	30 mg cap 12 hrly	40 mg cap 12 hrly
	Zerit	1 mg/mL		5 mL to 10 mL 12 hrly	10 mL to 12 hrly	15 mL 12 hrly	20 mL 12 hrly	20 mL 12 hrly	20 mL 12 hrly	20 mL 12 hrly	20 mL 12 hrly	20 mL 12 hrly	20 mL 12 hrly
EFV	Efavirenz	50, 100 and 200 caps		Special EFV weight classes: 10 < < 15 kg > age 3 yrs 200 mg cap nocte	15-20 kg 50 mg Plus 200 mg cap nocte	20-25 kg 2 X 50 mg Plus 200 mg cap nocte	25-32.5 kg 3 X 50 mg Plus 200 mg cap nocte	32.5-40 kg > 40 kg 3 X 200 mg caps nocte	30 mg cap 12 hrly	30 mg cap 12 hrly	30 mg cap 12 hrly	30 mg cap 12 hrly	40 mg cap 12 hrly
	Stocrin	600 mg tabs											
2nd Line ARV's													
ddl	Average Dose ranges based on BSA estimations			4.5 mL to 8.4 mL	6.5 mL to 9.7 mL	9.7 mL to 10 mL	10 mL to 15 mL	10 mL to 15 mL	10 mL to 15 mL	10 mL to 15 mL	10 mL to 15 mL	10 mL to 15 mL	10 mL to 15 mL
	Didanosine	25, 50, 100, 150, and 200 mg tabs, 10 mg/mL	120 mg/m <sup>2</sup> /dose 12 hrly	2.1 mL to 3.6 mL q 12 hrly	2.8 mL to 6.0 mL OR 2 X 25 mg to 3 X 25 mg tabs	OR 2 X 25 mg to 3 X 25 mg tabs	OR 3 X 25 mg to 2 X 50 mg	OR 2 X 50 mg to 2 X 50 mg	OR 2 X 50 mg to 2 X 50 mg	OR 2 X 50 mg to 2 X 50 mg	OR 2 X 50 mg to 2 X 50 mg	OR 2 X 50 mg to 2 X 50 mg	OR 2 X 50 mg to 2 X 50 mg
ABC	Abacavir	300 mg tab	8 mg/kg/dose 12 hrly	1.2 mL to 2 mL 12 hrly	2 mL to 4 mL 12 hrly	4 mL to 6 mL 12 hrly	6 mL to 8 mL 12 hrly	8 mL to 10 mL or 1/2 tab 12 hrly	10 mL to 12 mL or 1/2 tab 12 hrly	12 mL to 15 mL 12 hrly	12 mL to 15 mL 12 hrly	12 mL to 15 mL 12 hrly	12 mL to 15 mL 12 hrly
	Zidgen	20 mg/mL		2 mL to 4 mL 12 hrly	4 mL to 6 mL 12 hrly	6 mL to 8 mL 12 hrly	8 mL to 10 mL or 1/2 tab 12 hrly	10 mL to 12 mL or 1/2 tab 12 hrly	12 mL to 15 mL 12 hrly	12 mL to 15 mL 12 hrly	12 mL to 15 mL 12 hrly	12 mL to 15 mL 12 hrly	12 mL to 15 mL 12 hrly
LPV/RTV	Single cap: LPV/RTV 133.3/33.3 mg			> 7 kg: 1.1 mL to 1.5 mL 12 hrly	1.5 mL to 2.3 mL 12 hrly	2.5 mL to 3.1 mL 12 hrly	3.1 mL to 3.8 mL 12 hrly	3.1 mL to 3.8 mL 12 hrly	3.1 mL to 3.8 mL 12 hrly	3.8 mL to 5 mL 12 hrly	3 caps 12 hrly	3 caps 12 hrly	3 caps 12 hrly
	Ritonavir	100 mg tabs	12 mg/kg/dose q 12 hrs	1.1 mL to 1.5 mL 12 hrly	1.5 mL to 2.3 mL 12 hrly	2.5 mL to 3.1 mL 12 hrly	3.1 mL to 3.8 mL 12 hrly	3.1 mL to 3.8 mL 12 hrly	3.1 mL to 3.8 mL 12 hrly	3.8 mL to 5 mL 12 hrly	3 caps 12 hrly	3 caps 12 hrly	3 caps 12 hrly
NFV	Kaletra	Susp: 80/20 mg/ml	15-40 kg 10 mg/kg/dose 12 hrly	1.1 mL to 1.5 mL 12 hrly	1.5 mL to 2.3 mL 12 hrly	2.5 mL to 3.1 mL 12 hrly	3.1 mL to 3.8 mL 12 hrly	3.1 mL to 3.8 mL 12 hrly	3.1 mL to 3.8 mL 12 hrly	3.8 mL to 5 mL 12 hrly	3 caps 12 hrly	3 caps 12 hrly	3 caps 12 hrly
	Viracept	250 mg tab	55 mg/kg/dose 12 hrly	1 tab 12 hrly OR 3.3 to 5.5 scoops 12 hrly	1-2 tab 12 hrly OR 5.5 to 11 scoops 12 hrly	2-3 tab 12 hrly OR 11 to 16.5 scoops 12 hrly	3-4 tab 12 hrly OR 16.5 to 22 scoops 12 hrly	4-5 tab 12 hrly OR 22 to 25 scoops 12 hrly	5 tab 12 hrly	5 tab 12 hrly	5 tab 12 hrly	5 tab 12 hrly	5 tab 12 hrly

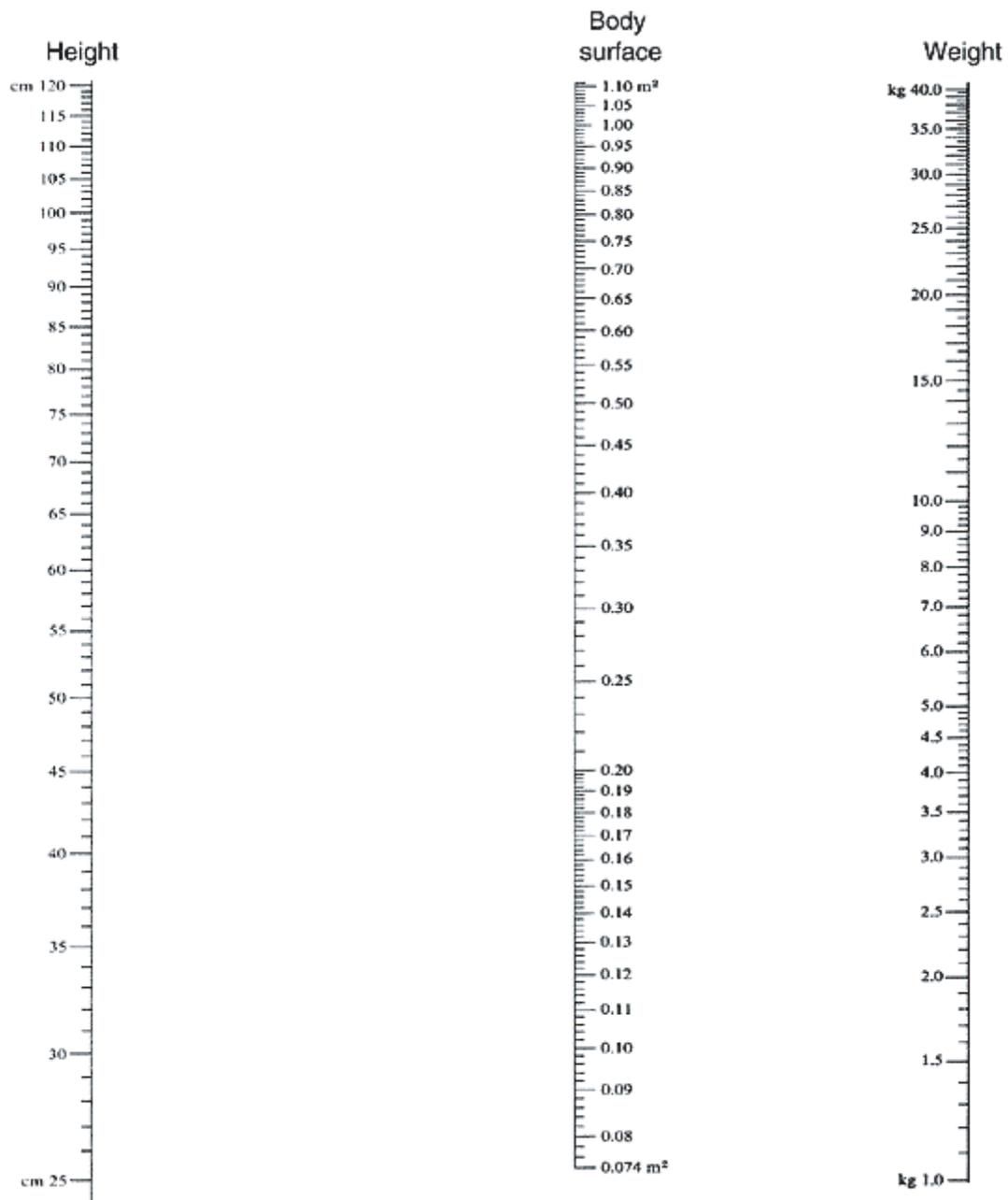
Cotrimoxazole Prophylaxis and BSA calculation for AZT, NVP and ddl

TMP-SMX	Cotrimoxazole	TMP 80/SMX 400mg (SS)	6-8 mg/kg/day divided bd	1 tab bd	1 tab bd	1 tab bd	1 tab bd	1 tab bd	2 tab OD	2 tab OD	2 tab OD	2 tab OD
Adults: 1 DS tab OD or 1 SS OD			2.5 mL od	OR 5 mL bd								

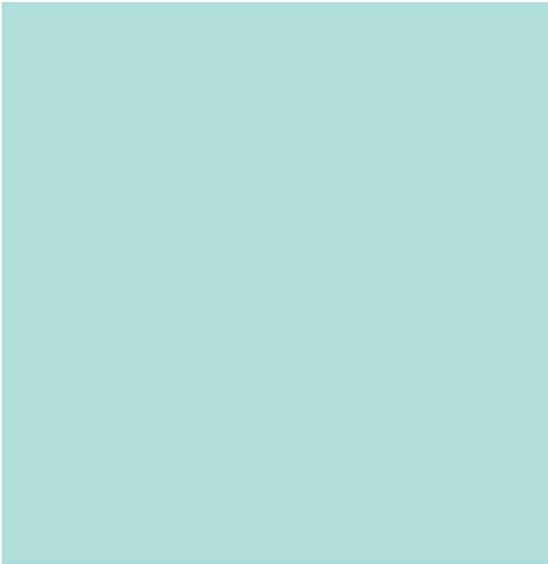
Peds doses: > 6 weeks of age: dose bd daily  
 This guide is for quick reference only. It is better to calculate a dose based on accurate weight or BSA and round to the nearest 10th of a cc. ALL amounts are in amount/dose to be given q 12 hr qhs or OD i.e 12 ml q 12hr means 12 ml/dose given every 12 hours qhs means the dose is given once per day at bed time (same time each day) while OD means the dose is given once per day at the same time each day

Originally developed by Medecins Sans Frontieres - Thailand. Adapted from KITSO of Botswana with CTX input from ANECCA Vers 4.0 Apr 05

### Normogram for Estimation of Body Surface Area (BSA)

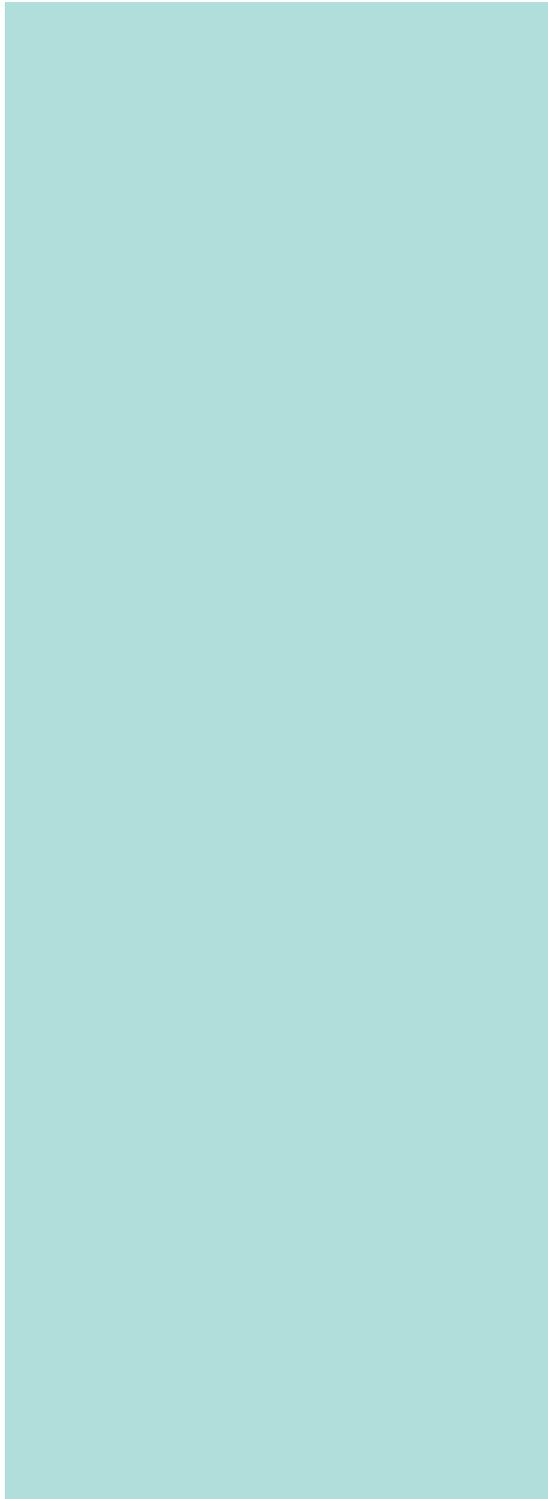


The Body Surface Area (BSA) is indicated where a straight line, which connects the height (in cm - left column) and weight (in kg - right column), intersects the middle BSA column.



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