# TRAINING MANUAL FOR NURSES ON THE USE OF ANTIRETROVIRAL DRUGS IN NIGERIA

**(First Edition: 2005)**

*Produced by*

NIMR

*In Collaboration with*

NACA

NASCP

*With the Support of*

APIN


# TRAINING MANUALS FOR NURSES ON THE USE OF ANTIRETROVIRAL DRUGS IN NIGERIA

## FIRST EDITION: 2005

## TABLE OF CONTENT

# FORWARD

Infection with the Human Immunodeficiency Virus (HIV) which is the causative agent of the Acquire Immunodeficiency Syndrome (AIDS) remains the greatest public health problem of this age. The first cases of HIV infections and AIDS were diagnosed in the USA in 1981 amongst homosexual drug abusers. Essentially, the infection spread so dramatically that by 1987 cases had been diagnosed in virtually all countries of the world. The pandemic had touched virtually all aspects of the social fabrics of most nations. It has affected men and women in urban and rural areas, as well as adolescents high and low profile politicians and socialities, servicemen and women, public and private sector workers, students and sex workers.

Despite several strategies to prevent emergence of new infections, the morbidity and mortality rates of HIV increased progressively in several countries. As new cases emerged, the pool of people living with the virus continued to increase and a substantial number were dying of AIDS. The impact of the pandemic was initially on the health sector but it soon evolved to enormously affect the socio-economic and development sectors. In most countries, the pandemic has had a selective impact on young men and women who constitute the mainstay of agriculture, education, commerce, industry and health. These developments stimulated efforts to strengthen preventive efforts as well as develop strategies for care and support of those already infected.

A turning point in the global control of the pandemic was the development of the Antiretroviral Drugs (ARVs). The use of adequate combination of ARVs was documented to be effective in the clinical management of HIV infections. The ARVs reduce morbidity and mortality of those infected through sustainable suppression of viral replication and reconstitution of the depleted immune system. The beneficial aspects of ARVs encouraged countries to adopt their use in the clinical management of HIV infections. However, ARVs are a new set of drugs with different levels of potencies and side effects. Their use in proper combinations achieve the desired results. However, when there are not properly used, treatment outcome can be enormously adverse. It is therefore imperative that health care personnel implementing ARV programmes must be adequately trained on the proper use of the ARVs.

In 2002, the Federal Government of Nigeria initiated a national ARV programme. Subsequently, other ARV programmes were initiated by various stakeholders including non-governmental organizations, faith-based organizations, state and private sector health facilities. To ensure that these programmes are properly implemented, there was the need to adequately train the various health personnel implementing these programmes. A training manual was developed by the Nigerian Institute of Medical Research in 2003 to meet this challenge. With this manual, several health personnel implementing ARV programmes in the country were trained between 2004 and mid 2005. A recent exercise was carried out by a team of consultants to evaluate the impact of these previous trainings on the quality of the ARV programmes implemented. One of the major recommendations in the outcome of the evaluation exercise was the need to develop specific training manuals for the various cadres of health care personnel. This was against the rather generic manual which was used in the earlier training programmes for all cadres of personnel including Doctors, Pharmacists, Nurses, Counsellors, Laboratory Scientists and Record Officers. It was envisaged that the use of specific modules for each cadre will help enhance the knowledge base of each group on the proper use of ARVs.

This challenge of developing new manuals was further taken up by the Nigerian Institute of Medical Research with the support of the Federal Ministry of Health and other agencies. The efforts have resulted in the development of separate training manuals for Doctors, Pharmacists and Nurses on the use of ARVs in the country. This achievement came at a good time in view of the need to continuously build a critical mass of trained personnel to sustain the national ARV scale up plan which is envisaged in the country in the next five years. I therefore highly commend the efforts of NIMR, NACA, NASCP and APIN for putting these new training manuals together.

It is with pleasure that I recommend this training manual for phramarcists for wide usage by all sectors and stakeholders implementing ARV programmes in the country.

**Professor Eyitayo Lambo**
Honourable Minister of Health
Federal Republic of Nigeria.

## PREFACE - FMOH

Despite the fact that in the past two decades several preventive strategies have been implemented in the developed and the developing countries, the HIV/AIDS pandemic is still growing globally. While the number of new cases is declining or stabilizing in the developed and a few developing countries, new infections are still emerging at a geometric rate in several developing countries. Africa and South-East Asia are bearing the greatest brunt of the pandemic as the two continents account for over 75% of the estimated 40million people living with the virus globally in 2004. Cumulatively, the pool of people infected globally is growing, and a substantial number are dying of AIDS.

Clinical management of infected individuals had essentially been palliative with focus on adequate nutrition and effective treatment of associated opportunistic infections. The development of the antiretroviral drugs in the mid 1990s was a landmark in the global control and management of those infected. Though the drugs don't offer a complete cure, their proper use has been documented to significantly reduce mortality and morbidity amongst those infected. Indeed the antiretroviral drugs, when taken in right combinations, have been reported to suppress viral replication and enhance the reconstitution of the immune system of those infected. These attributes of the ARVs have encouraged several countries to adopt their use in the clinical management of HIV infections.

A national ARV programme was initiated in Nigeria in 2002. Since then many more ARV programmes are being implemented in various centres in the country. The desire for the proper use of the ARVs to enhance the quality of the treatment underlined the need for training of the health personnel involved in the implementation of these programmes. Also with the proposed scaling up of the national programme, it has become imperative to train personnel that will implement the programmes in the new sites. The initial challenge was developing adequate manuals for the training programmes. However, with the support of APIN, the training manuals were developed by NIMR in 2003. With these manuals several training programmes were carried out between 2004 and mid 2005. However, it was observed that the training will be more effective if separate training manuals are used for the various cadre of personnel; namely, Doctors, Pharmacists, Nurses, Counsellors, Laboratory Scientists and Record Officers.

Efforts were deployed to develop these documents and by the end of third quarter of 2005, separate training manuals had been developed for the various cadre of personnel. These documents will serve as effective training companions to the health care providers for a better understanding of the fundamentals of ARV therapy. I therefore wish to recommend these manuals to the various health personnel especially those involved in the implementation of ARV programmes. I want to particularly commend the members of the Expert and Review Committees, other technical partners particularly NASCP, NIMR, NACA, APIN who contributed to the successful completion of this activity. The Federal Ministry of Health is also pleased to project this training programme as one example of the Health Sector Response Programmes of this administration.

**DR. EDUGIE ABEBE mni**
DIRECTOR OF PUBLIC HEALTH
FEDERAL MINISTRY OF HEALTH
ABUJA, FCT.

## PREFACE - APIN

The global HIV/AIDS pandemic continues to spread with more than 40 million cases reported in 2004. Nigeria represents one of the top five nations in the world contributing to the global pandemic, largely due to its large population size. The Government of Nigeria has made significant efforts towards prevention and control of the HIV/AIDS epidemic and part of the response has included the critical attention to those already infected with the HIV virus and in need of antiretroviral therapy (ART).

It is well recognized that prevention efforts to encourage voluntary counselling and testing, prevention of mother to child transmission and behaviour change interventions are enhanced when access to ART treatment and care is provided. In this way, stigma is reduced and communities are encouraged to mobilize prevention efforts while caring for those already infected and affected by the virus. Enacted by the Federal Ministry of Health, the Nigerian ART program has already provided life-saving ART to over 15,000 Nigerians suffering from AIDS. The plans for massive scale-up of this program through the support of the Government of Nigeria and other international ART partners are ambitious but necessary to provide drugs to the 100,000s of HIV infected Nigerians still in need of ART. The early success of the program is noteworthy and provides confidence that the goals for roll-out and scale-up will be achievable.

As provision of ART has begun in many developing countries, it has become clear that a major obstacle to successful implementation is the need for training of all sectors of the health care system. In the absence of such critical training, ART provision and management would be doomed to poor quality, a lack of standardization and a low potential for sustainability. In 2003, the National Institute of Medical Research (NIMR) initiated a critical program to design and implement the training required for ART treatment and care throughout Nigeria. Spearheaded by the leadership and vision of the Director General, ***Dr. Emmanuel Idigbe***, the modules were first drafted with input of Nigerian and outside experts in ART diagnosis, clinical management, counselling, and laboratory techniques. Training modules were designed, edited and finalized with important consultation of all ART treatment partners in Nigeria.

As Nigeria embarks on scale-up of their National ART program, the contribution of all members of the health care delivery system is clearly warranted. The training of doctors and ART specialists is obviously important yet nurses and counsellors will play a major and under appreciated role in the sustained delivery and management of ART therapy, so critical to effective treatment and care. The training modules directed to these groups should be commended. The development of high quality laboratory standards required for monitoring of patients on ART is another challenge of ART provision in developing countries. Nigeria has tremendous capacity for developing this key component of the ART program and the developed laboratory worker training modules will provide the necessary foundation for development of this capacity. The Nigerian ART training modules not only represent the highest quality and state of the art training materials for ART provision, but through the coordinated development with Nigerian investigators, stakeholders and government, represent content that is appropriate and specific to the Nigerian context.

The AIDS Prevention Initiative in Nigeria (APIN) funded by the Bill & Melinda Gates Foundation has been honoured to contribute and support this important effort. Our program has not only considered training and capacity building as a critical foundation to Nigeria's prevention and control efforts, but also a requirement for a high quality and sustainable ART treatment and care program.

The wide-scale implementation of these training modules will allow more and more ART centres throughout the country to be developed and deliver high quality ART. The multidisciplinary approach will allow all sectors of the health care system to participate in this ambitious program allow for more rapid expansion and support their local sustainability. The Government of Nigeria has set high goals for the scale-up of the Nigerian ART program, the implementation of the Nigerian ART Training modules will play an important role in our efforts to achieve these goals.

The program will no doubt serve as a model to other developing countries as they look to Nigeria's example for guidance in developing their own ART national programs.
More widespread access to high quality ART treatment and care will facilitate and integrate well in Nigeria's HIV/AIDS prevention and control programs already underway. We acknowledge this important contribution and remain confident that it will aid in our efforts to impact the HIV/AIDS epidemic in Nigeria.

**Prof. Phyllis Kanki**
*Director*
*AIDS Prevention Initiative in Nigeria (APIN)*
*Harvard School of Public Health*
*Boston, USA.*

## ACKNOWLEDGEMENT

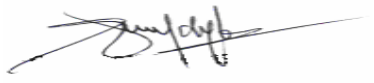
The Federal Government of Nigeria initiated a national antiretroviral treatment programme in 2002. Under this programme, 10000 adults and 5000 children living with the virus were to be treated in 25 health facilities. This was followed by other ART initiatives by NGOs, FBOs, the Organized Private Sector, the AIDS Prevention Initiative of Nigeria (APIN), the USA President's Emergency Programme for AIDS Relief (PEPFAR) and the Global Funds Programmes. The thrust of these other initiatives was to ensure that more people living with the virus have access to ART in the country.

For these programmes to be effectively implemented, it was pertinent to train the health care providers working in the various ART centres, on all issues related to national antiretroviral drug administration and monitoring. The Nigerian Institute of Medical Research was charged with the responsibility of conducting these training programmes. A training manual was subsequently developed by the Institute and in 2004/2005 several training programmes were carried out. A team of health personnel was trained from each ART centre and this comprised of a doctor, pharmacist, nurse, counselor, laboratory scientist and record officer.

In June 2005, the impact of the training programmes was evaluated by a team of independent consultants. One of the main recommendations from the evaluation exercise clearly identified the need to develop separate training manuals for the various cadres of health personnel in place of the rather generic manual that was used in the previous training programmes. This edition of the training manual for Nurses was therefore developed as an outcome of the evaluation exercise. This revision came at a good time, when cummulative efforts are being directed towards a further scale up of the ARV treatment programmes in the country. It therefore became imperative to build a critical mass of health care providers with adequate expertise to sustain these various scaling up programmes.

This revised manual essentially addresses the training needs of Nurses to effectively provide antiretroviral therapy as well as other components of care and support of people living with the virus. To achieve this, an expert committee whose membership comprised of experienced Nursing Educators, Administrators, Clinicians, Nutritionist, Counsellors, Representatives of the Nursing and Midwifery Council of Nigeria as well as the West African College of Nursing was set up. The task of the committee was to review the earlier manual and develop the outline and content of a new manual that will be specific for Nurses. The draft recommendation of this expert committee was further reviewed by a sub-committee for its structure and content validity. Subsequently, this final version of the manual was developed by a consultant.

I would therefore want to acknowledge the brilliant efforts and contributions of the members of the Expert Committee as well as members of the Review Committee. They have been adequately listed in the document. I would also like to acknowledge the efforts of our consultant Dr. M. O. Ukpong, who developed the manual and those of the members of the monitoring and evaluation team and respondents who took part in the exercise. Finally, the Institute is grateful to the AIDS Prevention Initiative in Nigeria (APIN) for providing the financial support for this project.



**Dr Oni Idigbe**
*Director General*
*NIMR*

## MEMBERSHIP OF THE EXPERT COMMITTEE

| S/N | NAME | POSITION | ORGANISATION |
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| 3. | Mrs Nelson Nneoma Nmannaya | Member | School of Nursing, LUTH, Lagos |
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| 6. | Mrs. Sowemimo- Coker M. O. | Member | NIMR, Yaba, Lagos |
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| 9. | Damtong Nandi | Member | JUTH, Jos Plateau |
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| 17. | Mrs. Sanwo Adeola 0. | Member | CHO Training Institute, LUTH, Lagos |
| 18. | Mrs. Belin Anne | Member | ACNO, Faith Alive Foundation Jos |
| 19. | Mrs. Erinoso A. A. O. | Member | FMOH, Nurse Tutors' Programme, Lagos |
| 20. | Miss Nnaji Ijeoma R. N. | Member | AIDS Control Unit, Min of Health, Enugu, |
| 21. | Mrs. Adigwe Esther Enweniwe | Member | Nordica Fertility Centre, VGC, Lagos |
| 22. | Mrs. Eze Margaret Chika | Member | Nursing & Midwifery Coun. of Nig, Lagos |
| 23. | Mr. Peter Christopher Jantulla | Member | 68 Nigerian Army Reference Hosp, Lagos |
| 24. | Mrs. Usifoh Charity A. | Member | Obstetrics & Gynaecology, LUTH, |
| 25. | Mrs. Garba Comfort | Member | Ahmadu Bello Univ. Teaching Hosp, Zaria |

# MEMBERSHIP OF THE FINAL REVIEW SUB-COMMITTEE

| S/N | POSITION | ORGANIZATION |
|---|---|---|
| 1. Chief Opara Rose | Chairman | Nurse Consultant, LSDPC Lagos |
| 2. Miss Nnaji Ijeoma R.N. | Secretary | AIDS Control Unit, Min. of Health, Enugu |
| 3. Mrs. Amadi, Eva. N | Member | NIMR, Yaba, Lagos |
| 4. Mrs. Chiemeka O. | Member | Nursing & Midwifery Council of Nig, Lagos |
| 5. Garba Comfort | Member | Ahmadu Bello Univ. Teaching Hosp, Zaria |
| 6. Dr. R. C. Anyanwu | Member | NIMR, Yaba, Lagos |
| 7. Mrs. Mamzu. Z. G. | Member | Federal Ministry of Health, Abuja |
| 8. Mr. Adeleye Solomon | Member | West African Council of Nurses, Lagos. |
| 9. Mrs. Nneoma N. Nelson | Member | School of Nursing, LUTH, Lagos |
| 10. Mrs. A. A. O. Erinoso | Member | FMOH, Nurse Tutors' Programme, Lagos. |

# USE OF THIS MANUAL

This training targets all nurses who provide clinical care and support to patients infected with HIV in health care settings. Course participants are nurses working in the public, private and government hospitals (primary, secondary and tertiary health care institutions)

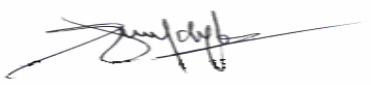
Trainers who use the various modules must be experts in their particular field. The training design uses an integrated approach to antiretroviral administration taking recognition of the roles of clinical medicine and laboratory monitoring in the adequate management of HIV-infected patients in health care settings. The manual consists of fourteen training modules to be taught over a minimum of six days and maximum of twelve days. The modules are:

- Overview of HIV/AIDS
- Strategies for Prevention and Control of HIV
- Voluntary Counselling and Confidential Testing
- HIV/AIDS: Nursing Perspective
- Assessment of Patient with HIV/AIDS
- Antiretroviral Drug Therapy in the Management of HIV/AIDS
- Strategies of Highly Active Antiretroviral Therapy (HAART)
- Adherence to Antiretroviral Therapy
- Comprehensive Care and Support for PLWHA
- Opportunistic Infections
- Nutrition and HIV/AIDS
- HIV Palliative and Terminal Care
- Women and HIV/AIDS
- Emerging Special Circumstances

Specifically, this manual is developed as a trainer of trainers manual. The concept is to train a critical mass of trainers that can act as facilitators at the geopolitical zones and train other health care personnel in the zone. The training programme entails interactive lecture sessions in the mornings and ending the day by performing activities that would enhance knowledge and skills through the application of the concepts learned from the lectures. Practical sessions includes visit to ARV therapy implementing centres, HIV/AIDS testing and monitoring laboratories as well as other networking facilities.

A complementary resource book published by NIMR should be used along with the manual to facilitate the understanding of the content of the lecture notes.

The concept of antiretroviral therapy is ever changing and so would the content, structure and duration of the use manual. The intent is that this edition would be reviewed periodically. Comments are therefore welcome on the content of this manual.



**Dr Oni Idigbe**
*Director General (NIMR)*

## List of acronyms

AIDS -Acquired Immune Deficiency Syndrome
ALT - Alanine Transferase
APIN - AIDS Prevention Initiative in Nigeria
ART - Antiretroviral Therapy
ARV - Antiretroviral Drugs
AZT - Azidothymidine (Zidovudine)
BCG - Bacillus- Calmette-Guerin
CBOs - Community Based Organisations
CDC - Centres for Disease Control
CMV - Cyclomegalovirus
CTZ - Co-trimoxazole
DNA - Dioxyribonucleic Acid
EBF - Exclusive Breast Feeding
ELISA - Enzyme-linked Immunosorbent Assay
FMOH - Federal Ministry of Health
FTC - Emtricitabine
HAART - Highly Active Antiretroviral Therapy
HIV - Human Immunodeficiency Virus
IEC - Information, Education & Communication
IgG - Immunoglobulin G
INH - Isoniazid
MAC - Mycobacterium Avium Complex
MTCT - Mother-to-Child Transmission
NACA - National Action Committee on AIDS
NAFDAC - National Agency for Food and Drug Administration and Control
NASCP - National AIDS/STDs Control Programme
NNGO - Non Governmental Organisation
NNRTI- Non Nucleoside Reverse Transcriptase Inhibitors
NRTI - Nucleoside Reverse Transcriptase Inhibiton
NtRTI - Non Nucleotide Reverse Transcriptas Inhibitors
NVP - Nevirapine
OIs - Opportunistic Infections
OPV - Oral Polio Vaccine
PABA - People affected by AIDS
PCP - Pneumocystis carinii pneumonia
PCR - Polymerase Chain Reaction
PI - Protease Inhibitors
PLWHA - People Living with HIV/AIDS
PMTCT - Prevention of Mother-to-child Transmission of HIV
RNA - Ribonucleic Acid
STIs - Sexually Transmitted Infections
TB - Tuberculosis
TT - Tetanus Toxoid
UNAIDS - United Nations Joint Programme on HIV/AIDS
UNFPA - United Nations Population Fund
UNICEF - United Nations Children's Fund
USAID - United states Agency for International Development
VCCT - Voluntary Counselling and Confidential Testing for HIV
WHO - World Health Organisation

# Introduction to the Use of the Training Manual

## Teaching the course

Familiarise yourself with some more details about the content of the manual. You can get more details by reading the topics in the training manual reference document developed specifically for use along with this manual. Ensure that trainers and participants have clear and accurate expectations about the course.

Trainers play a unique role in helping their audiences confront the dynamics of the HIV/AIDS epidemic. Although you might be an expert in technical content and training, your role in this course extends beyond lecturing or providing information. Trainers need to inform, support and acknowledge implementation issues within the social and cultural context of the existing training setting to ensure a successful experience for all training participants.

This section will review the principles of adult learning generally and within the specific context of training to provide HIV/AIDS treatment, care and support.

## Principles of adult learning

Principles to keep in mind when working with adult learners:

- Create a supportive learning environment and establish safe training practices, e.g., be sure that learners feel confident that their contributions will be received respectfully.
- Build trust with learners by demonstrating that you are committed to the course and are willing to share your own experiences.
- Provide opportunities for learners to practice what they are learning and to address feelings and ideas that arise.
- Build teamwork and a sense of group belonging by encouraging active participation.
- Be accountable. Explain how you know what you know.
- Create a culturally sensitive and respectful learning environment by becoming familiar with local customs and values.

## The role of the trainer in adult learning

The trainer's role is to facilitate the learning experience of the adult learner. To that end, you should create a climate in which participants can accomplish course outcomes and explore their life experiences to help them to learn.

## Trainer tips

- Emphasise the immediate usefulness and applicability of material presented. Adult learners are particularly receptive to information that will make a difference in their daily practice.
- Elicit personal experiences that are culturally sensitive and appropriate. Adult learners can bring a reservoir of experience to the course, and their contributions are an important resource for training programmes.
- Encourage group interaction and participation early in each session.

- Make an effort to learn participants' names earlier on and to use their names whenever possible.
- Be available after each session to answer questions and discuss concerns.

- Consult with participants throughout each presentation to gauge their comprehension and attentiveness. Generally, the more side conversation and noise in a room, the less the participants are focused on the material. Pay attention to nonverbal cues to gauge learners' attentiveness.
- Be clear, concise and easily understandable
- Do not judge participants, but assist them with learning – be encouraging
- Praise or thank participants when they perform an exercise well, participate in a group discussion, ask a question or help other participants.

## Strategies for educating adults

*Presentations and discussions*

Use didactic training methods (as directed on the following page) to present scientific and technical content. Avoid reading directly from the overheads or slides. Instead, supplement them with examples, practical problems, and discussion questions. Elicit feedback from the audience at critical junctures; encourage discussion.

*Small group discussions*

Facilitate small group discussions to foster team coherence. Those discussions provide trainers with an opportunity to validate or modify learners' perceptions and knowledge.

- Assign a topic, issue, or question that participants can address in small groups.
- Designate a leader to facilitate and summarise the group's findings.
- Consider the task objective as you determine how to constitute groups. You might divide participants according to region (clinic X or clinic Y). If you want the groups split up randomly you could ask participants to count off by threes (or any small number): the first person is in group 1, the second is in group 2, the third is in group 3, the fourth is group 1 and so on.

*Story telling*

Use culturally appropriate stories from learners to illustrate critical points. Weave cultural beliefs and personal experiences into stories to convey information vividly.

*Case studies*

Present culturally relevant, actual or hypothetical clinical situations. Ask learners to propose solutions.

*Interactive exercises and games*

Use interactive exercises to facilitate team building and reinforce learning.

- Invite learners to consider a specific topic.
- Pose questions, allowing time for learners to record their answers.
- Encourage participants to discuss their answers and exchange ideas.
- Record responses on the flipchart and encourage learners to respond to the group's feedback.

### *Panel discussions*

During group work sessions, use panel discussions to help participants gain insight into the physical, emotional, and financial impact of HIV/AIDS. Panels with persons infected or affected by HIV can be a powerful tool for influencing the attitudes and behaviours of healthcare workers. Other panels that may be considered include:

- Healthcare workers panel: to share ideas for handling the emotional challenges of caring for patients with HIV infection.
- Ministry of Health leaders and staff member panel: to provide information about national policies and strategies for fighting HIV/AIDS.
- Nongovernmental organisation (NGO) employees' panel: to share information about the important role of NGOs in providing PMTCT services and support for people living with HIV/AIDS (PLWHA).

## The flow of training

### *Flow and pacing*

Pay attention to the order and flow of activities to ensure that new information is assimilated at an appropriate pace. Make sure that learners complete the course with a clear action plan for applying their knowledge.

### *Didactic training*

Didactic training progresses from the simple to the complex. The trainer first reviews and outlines fundamental concepts to establish a shared understanding of the basics. New material is integrated gradually and illustrated with practical examples when possible. Remember that learners can absorb and integrate only five or six new pieces of information at a time.

## Trainer skills

### *Facilitating the group*

Facilitation is not teaching, not telling, not lecturing, not preaching and not directing, nor just a technique for running workshops. It is the facilitator's role to provide resources and structures for participants to explore, learn and develop.

A facilitator helps participants learn through individual and group discussions. As a trainer, you are the facilitator.

You should be thoroughly familiar with module content. Preparation is the key to conducting a successful training course. Complete the following before starting each module:

- Read module objectives and teaching exercises.
- Prepare for each of the exercises.
- Obtain and organise the materials needed.
- Read the text and overhead materials.
- Ensure that you understand national policies.

Responsibilities of the facilitator include the following:

- Introduce each module and key concept.
- Lead group discussions and training exercises.
- Answer questions.

- Explain ideas and clarify issues.
- Discuss how learners can apply the information to their own work.
- Give constructive feedback.

Familiarity with the local cultural environment is essential to effective group facilitation. Training strategies could require modification to respect various cultural standards. For example, in some areas, cultural norms dictate acceptable eye contact or physical proximity of the trainer and learners.

## Managing challenging participants

In extreme circumstances the Facilitator must also be prepared to act as a conflict manager if conflict arises. Just remember, conflict can be helpful, leading to improved communication. Do not become involved in personal conflict or arguments. Your own views are really not important. Focus on what the group think and feel. You may encourage participants to reflect, question and evaluate their experiences, but never force participants to accept your viewpoint.

Through training, continually assess the interpersonal dynamics of the group. Occasionally, the learning environment might be disrupted by individual participants. A challenging participant might be overly talkative or dominating in discussions. He or she may be disrespectful to other participants and, as a result, other participants may be hesitant to express their opinions. Depending on the situation, the trainer should address such behaviours either in public or privately.

## Encourage balanced discussion

HIV/AIDS is a controversial subject in many communities that is likely to prompt fervent debate. To tackle key underlying issues and foster discussion, the trainer should actively engage participants who express disparate viewpoints. In some settings, the group might accept the position or approach presented in the curriculum. In others, the group could need additional time to reach consensus on complex issues.

## Managing time

Times allocated for each section in the curriculum are guidelines only. All of the training content is important; however, the trainer should acknowledge the particular needs, knowledge and experience level of the group and make adjustments accordingly. It is however very important for facilitators to be disciplined with time allocation. However, do not try to run through all the activities at lightening speed to keep to a schedule. The Facilitator needs to run at a pace that suits the group. Remember, sometimes less will mean more. Keep an eye on time and learn to interrupt a discussion gently.

Each trainer may re-allocate time provided that the key concepts of each module are addressed and the programme presented as a comprehensive ART package within the overall time limit.

## Course schedule

The course schedule is outlined in the manual. It is recommended that each module begins with an introduction of its overall goal and objectives as well as a brief introduction to the content of the module. This can be done in approximately 10 minutes.

## Endnote

As a trainer, you are a facilitator of learning, not merely an instructor. Encourage participants to identify their aims and objectives for the course. As a trainer, you will help them accomplish those aims and objectives. Remember that all members of the group respect and learn from each other's unique skills, perspectives, and life experiences.

## Trainer's preparation checklist

### Daily preparation

Each day arrive with enough time to set up the materials and equipment and arrange the furniture and audiovisual equipment in a way that fosters learning and teamwork.

### Climate setting

Ensure that the physical environment is comfortable, well lit, and adequately equipped. Create a psychological environment where learners feel accepted, respected, and supported.

### Room setup

Because this course uses a combination of didactic, interactive, and experiential techniques, the classroom should have tables and chairs that can be rearranged easily. For didactic presentations, the room should be set up so that all participants can see the slides or overhead projections. For interactive activities, more informal arrangements work best. In either case, you might need to arrive early to organise the room.

### Goals and objectives

Review each module's goal and objectives.

### Course content

Review existing resources to ensure you have all background materials related to the course content. Although you will not be able to answer every question, try to master the curriculum content, related support materials and relevant examples.

### Course materials and teaching aids

Be sure that all educational materials (overheads, flipcharts, markers) are available and that equipment is in good working condition.

# Module 1
# Theme: Overview of HIV/AIDS

## Goal
To enhance the background knowledge and the natural progression of HIV infection.

## Objectives
1. Understand the biology and structure of HIV
2. Discuss epidemiology of HIV/AIDS globally, in Africa and particularly in Nigeria.
3. Describe the pathogenesis and natural progression of HIV infection
4. Update knowledge on HIV/AIDS and discuss any misconception and myths

## Content
- Background history of HIV infection
- Immune system in health and illness
- Modes of transmission of HIV
- Pathogenesis of HIV infection
- Progression of HIV infection
- Epidemiology of HIV/AIDS

## Methodology
- Lectures/Discussion
- Brainstorming
- Question and answers
- Video Show

## Materials required
- Overhead projector
- Data/Multimedia projector
- Transparencies
- Flipcharts and flipchart stand
- Markers
- Masking tape
- Laptop
- Diskettes/Other media storage devices

## Activity 1: Background history of HIV

Participants will have a good understanding of how HIV infection became a diagnostic entity and how the HIV virus was identified and characterized.

***Time: 25 minutes***

## Activity 2: Epidemiology of HIV/AIDS

The current status of the global epidemic will be discussed. The epidemic as it affects sub-Saharan Africa and Nigeria will be highlighted during this session

***Time: 25 minutes***

## Activity 3: Modes of transmission and Prevention of HIV infection

Participants will update their knowledge on the various modes of transmission of HIV, the routes of infection most common in Nigeria and the risks associated with the different modes of transmission.

***Time: 20 minutes***

## Activity 4: Biology and structure of HIV

The specific biologic and structural components of the virus which contributes to its infectivity and makes it difficult to eradicate.

***Time: 20 minutes***

## Activity 5: Mechanism of HIV infection

The process of actual infection of CD4-bearing cells will be described. Participants will be instructed on the basic processes in HIV infection and replication.

***Time: 20 minutes***

## Activity 6: Molecular epidemiology of HIV

The various strains, subtypes and recombinant forms of HIV and its global distribution will be shared with participants. The implications for vaccine and drug research will be highlighted.

***Time: 25 minutes***

## Activity 7: Pathogenesis of HIV

Participants should understand the progression of HIV infection from sero conversion until AIDS. The implications of this for laboratory investigations will also be discussed.

***Time: 20 minutes***

## Activity 8: Group work

Participants would watch a film which shows the ravaging impact of HIV infection and its implications for everyday living

***Time: 40 minutes***

# Lecture/Facilitator's notes

## Introduction

The facilitator should introduce the goal and objectives of the module. The goal of the module is to update the knowledge of participants on the epidemiology, biology and pathogenesis of HIV. Together with participants, the risk factors and impact of the epidemic in Nigeria will be identified and possible intervention strategies would be identified. The objectives of the module should be highlighted: S(he) would then introduce the resource person who would take participants through the content of the module.

*Time: 5 minutes*

## Activity 1: Background history of HIV

- HIV infection was first identified among homosexual men in the United States of America in 1981.
- This observation resulted in an early hypothesis (and misconception) that AIDS resulted from behaviour specific to gay men because at that time in the 1980s' gay men sometimes inhaled amyl and butyl nitrate as 'poppers' to enhance sexual performance.
- This was largely dismissed when the syndrome was later observed in other population groups in Europe, America and Central Africa. HIV/AIDS did not originate from gay men and neither is its origin known.
- The observations of symptoms among heterosexual, bisexuals, homosexuals, haemophiliacs, intravenous drug users and in babies of infected mothers led to the inference that HIV was an infectious process and that transmission of infection was through body fluid, blood and blood products
- This led scientists to begin investigating a host of other infectious agents for any sero-epidemiological association with AIDS.
- Among the chief suspects were cytomegalovirus because of its association with immuno-suppression, Epstein Barr virus because of its known property for populating lymphoid tissue and hepatitis B virus because it was also transmitted by sexual exposure and blood. It was thought that perhaps one or more of these viruses may have mutated to cause a new clinical syndrome, AIDS.
- Comparative sero-prevalence studies showed no convincing association between AIDS and any of these viruses or a score of other agents.
- The human T-lymphotropic virus Type 1 (HTLV-1) was recognised 2 years before the discovery of HIV and therefore only a few researchers were aware of its existence. Also, retroviruses were well known in animals and were associated with leukaemia and lymphoma rather than frank immunosupression. The virus HTLV-1 was found at highest rates in regions of the world where AIDS had not yet been diagnosed.
- Studies on the HTLVs showed that they preferentially infected and alter T lymphocytes, the cells most often affected by AIDS and that they could cause immuno suppression. Evaluation of persons with AIDS showed the presence of HTLV-related antibodies and reverse transcriptase enzymes.
- In 1983, the HIV virus was isolated by scientists working in the laboratory of Robert Gallo and at the same time by other scientists in France. It was initially named HTLV-III or the lymphadenopathy associated virus (LAV). This was later called human immunodeficiency virus or HIV, later termed HIV-1 after the discovery of HIV-2.

- In 1986, another retrovirus that resulted in immunodeficiency in humans was identified in West Africa. This virus was named HIV-2.

### History of HIV/AIDS in Nigeria

- Since the first reported case in 1986, prevalence has increased over the years from 1.8% in 1991 to 5.0% in 2003.
- 3.8 million Nigerians 15–49yrs are estimated to be infected, the highest in the world
- 350,000 to 700,000 PLWHA require antiretroviral therapy.
- It is estimated that 100,000 HIV positive children are born annually and 1.2 million children have been orphaned since the beginning of the epidemic; the highest number for any country globally.

## Activity 2: Epidemiology of HIV/AIDS

*(Mount the transparencies on epidemiology of HIV. this would enhance participant's understanding)*

- In the first decade of the AIDS pandemic, cases were reported largely from North America, Europe, Australia and part of Latin America.
- In the second decade of the global pandemic, studies showed rapid increase in HIV-1 infection in Asia, Africa and further increases in the number of people infected in Latin America.
- Although the prevalence of HIV-1 infection is decreasing in North America and Europe, success in containing the infection globally is being overwhelmed by failure to prevent millions of new infections in Africa and Asia.
- Globally, 47 million people have been infected with HIV infection. As of December 2004, 39.4 million people are estimated to be living with the virus. Of these, 37.2 million are adults, 17.6 million are women and 2.2 million are children under the age of 15 years. Approximately 20 million adults and children have died from HIV/AIDS and an estimated 14 million children have been orphaned by HIV/AIDS.
- According to UNAIDS, about 14,000 new infections occurred *each day* in 2004. Of these new infections:
    - About 6,000 each day were among persons 15 to 24 years old.
    - Almost 2,000 each day were in children younger than 15 years old.
    - Most of the infections in children younger than 15 years old occurred through mother-to-child transmission (MTCT) of HIV.

- Sub-Saharan Africa is the worst affected by the epidemic with 28 million of the global 40 million infected persons living on the continent. In 2003, 3.4 million Africans became infected with HIV-1 of which 700,000 were children under 15 years. In the same year, 2.4 million people died of AIDS in sub-Saharan Africa.
- In Nigeria, the picture is the same. The national prevalence in 2003 for HIV-1 is 5.0% with some states having as high as 12%. 3.5 million adults are infected with HIV-1 with Nigeria being the third worst affected nation in the world after South Africa and India.
- Since the first reported case in 1986, prevalence has increased over the years from 1.8% in 1991 to 5.0% in 2003.
- 3.8 million Nigerians 15–49yrs are estimated to be infected, the highest in the world
- 350,000 to 700,000 PLWHA require Anti-retroviral therapy (ART).
- It is estimated that 100,000 HIV positive children are born annually and 1.2 million children have been orphaned since the beginning of the epidemic; the highest number for any country globally

# Activity 3: Modes of transmission and prevention of HIV Infection

## Sexual exposure:

- Heterosexual exposure is the main mode of transmission of HIV in Nigeria and other parts of sub-Saharan Africa.
- This risk of infection from sexual intercourse depends on a number of factors including:
    - The type of sexual practice (most infections occur through vaginal intercourse though evidence exists as to the increased risk of infection from receptive anal sex)
    - Susceptibility of the exposed individual (the lower the immune status, the higher the risk of infection)
    - Gender (women are more susceptible to infection than men because of prolonged contact of the virus with the vaginal and cervical mucosa compared with the male penis and urethral orifice)
    - The presence of concurrent genital infections (usually arising from sexually transmitted infections).

## Perinatal transmission:

- This term is used for mother-to-child transmission.
- It takes cognizance of all the various routes a child can get infected with the virus from the mother.
- An infected mother can infect her child during her pregnancy, at the time of delivery or through breast feeding.
- The sperm of the father and the ovum of the mother do not appear to play a role in the infective process.
- Rather, during pregnancy, the virus could:
    - cross the placenta barrier
    - there could be contact between the mother and child's blood during passage through the birth canal and exposure to virus infected tissues and fluids
    - the virus could be transmitted to the child through the breast milk
- The proportion of HIV-infected women who pass on the infection to their infants in sub-Saharan Africa ranges from 30%-40%.
- Transmission through breast milk is estimated at 14-29%.
- Currently, about 1 million children under the age of 5 years are infected with HIV.

## Blood and blood products:

- HIV infection can be spread through the use of contaminated needles or equipment.
- Through the sharing of needles by intravenous drug users.
- The risk of infection from blood transfusion has been significantly reduced around the world because of antibody screening of donor blood for HIV and the widespread use of disposable and/or sterilizable needles and medical equipment.

## Occupational exposure:

- HIV transmission by occupational exposure has been intensively studied and monitored.
- Percutaneous, mucous membrane and cutaneous exposures to contaminated body fluids would be ready sources of viral exposure in many health care settings.
- Studies indicate an average risk of HIV-1 seroconversion after needle stick injury as approximately 0.3%.

- Post-exposure prophylaxis with antiretroviral drugs significantly diminishes the risk of transmission of HIV by this route.

### New prevention strategies:

- Currently, a number of HIV prevention strategies are under developed and are been studied. These strategies include:
- Circumcision: A recent study of 3,000 HIV-negative men in South Africa found that circumcision can reduce by about 65% the risk of men contracting HIV through sexual intercourse with women. Similar circumcision studies are under way in Kenya and Uganda
- Treating pre-existing Herpes infection: A study conducted about five years ago in four African cities found that a pre-existing herpes infection increased the risk of HIV transmission. There are two international trials of acyclovir, which is used daily to treat herpes, to see whether suppressing herpes can prevent HIV transmission. If the drug works, it could affect the HIV/AIDS pandemic because more than 80% of HIV-positive adults are co-infected with herpes
- Antiretroviral drugs: Other prevention trials are focusing on whether antiretrovirals might be helpful in preventing HIV transmission. National Institute of Allergy and Infectious Diseases, recently launched a study of antiretroviral treatment involving 1,750 couples worldwide
- Microbicides: Five efficacy trials of vaginal microbicides are currently under way, and one study is examining microbicides that can be placed in the rectum. Researchers also are looking into incorporating antiretrovirals such as tenofovir into microbicides
- Early detection: Scientists also are looking at ways to improve HIV detection at early stages of infection, when the risk of transmission is highest
- Diaphragms: Another study is looking at how the diaphragm and a lubricant can help prevent HIV transmission. Studies are on in Zimbabwe and South Africa with notes that the device might help prevent the virus from reaching the cervix and endocervix, where most female infections occur
- Gels: Other scientists are conducting a study in Kenya to discover whether wiping the penis with an ethanol-based gel can prevent transmission of HIV, herpes and other sexually transmitted diseases
- Antidepressants: A researcher in San Francisco will launch a study that will evaluate the impact of antidepressants on HIV transmission. Previous studies have indicated a connection between the use of anti-depression for depression in men who have sex with men and risky sexual behaviour

## Activity 4: Biology and structure of HIV

*(Mount the picture of the virus on the transparency and teach with the aid of the transparency. This would enhance participant's understanding)*

- The virus is made up of two parts – the outer envelope and an inner core. The outer envelope has glycosylated protein spikes that extend outward (gp120) and are the first viral proteins to be exposed to the immune system.
- The core is enclosed in a coat made of protein known as p24. Within the core of protein are two identical strands of RNA.
- The RNA is the genome or repository of the genetic information of the virus.

- In addition to the RNA, the core contains three enzymes called reverse transcriptase, integrase, and protease.
- The RNA genome is made up of three major genes, *gag* (group-specific antigen), *pol* (polymerase) and *env* (envelope) which code for different products that become structural and non-structural parts of the virus.
- In addition, HIV-1 has a number of regulatory and accessory genes including *vif*, *vpr*, *tat*, *rev*, *vpu* and *nef* that encode proteins that are essential to the viral life cycle.
- There are two main types of the virus – the HIV-1 and HIV 2 viruses. They demonstrate similar virologic properties and common life cycle. They have similar features and structures under the electron microscope. There is little difference in their effect on cells. However, HIV-2 has an additional regulatory and accessory gene – the *vpx* gene. It also utilizes more co-receptors than the HIV-1 virus to bind to cell surfaces.

## Activity 5: Mechanism of HIV infection

*(Mount the picture of this process on the transparency and teach with the aid of the transparency. This would enhance participant's understanding)*

- HIV targets the CD4 receptor bearing cells such as T lymphocytes, glial cells, macrophages, Langahan cells. The sperm and ovum do not contain CD4 receptors. .
- HIV virus has affinity for these cells because it bears a molecule that allows for attachment to cells
- Other cells in the body that can be infected by HIV are the macrophages and glial cells of the brain.
- When the virus binds to the CD4 containing cells, in association with the co-receptor, the HIV envelope penetrates the cell wall, through a mechanism not well understood, allowing viral entry.
- As soon as this happens, the envelope of the virus is shed and the viral contents are released into the cytoplasm of the host cell.
    - Within the host cell, the virus deposits its RNA to reprogram the cell's machinery to produce more viruses.
    - First, the viral RNA must be translated into DNA since DNA is the language of all human cells.
    - To do this, the HIV uses its own enzyme reverse transcriptase, which is carried within the virus particle.
    - Once the reverse transcriptase has made a DNA transcript of the viral RNA, the DNA is integrated into the host cell DNA and the viral DNA is ready to make new HIV.
    - To do so, long chains of viral transcripts may be transcribed and then translated into polypeptides, using host cell machinery.
    - Using the protease enzyme provided by the virus, these chains are cut or cleaved into smaller pieces so that they can be assembled into new viruses.
- As the packaging step is completed, HIV-1 moves to the host cell membrane and interacts with the membrane to allow viral release. The viral envelope incorporated around the assembled virion structure, incorporate portions of the host cellular material as the virion is released from the cell. This process is known as viral budding.
- HIV use part of the cell's membrane to complete its final structure.
- On completion of the cycle, the host cell may be destroyed in a process that is incompletely understood.

## Activity 6: Molecular epidemiology of HIV

*(Mount the picture of this global distribution of the various HIV subtypes and teach with the aid of the transparency. This would enhance participant's understanding)*

- An analysis of the sequences of the HIV genome led to the classification of the HIV-1 strain into three groups – M (major), N (non-major) and O (outlier).
- The latter two are limited to West and Central Africa.
- Group M, the most common globally, is further divided into nine subtypes namely, A, B, C, D, F, G, H, J and K
- A number of other forms arise from a recombination of the subtypes. These are known as recombinant forms. Recombination occur when an individual is superinfected with two or more subtypes or groups of HIV-I.
- Co-infection of HIV-1 and HIV-2 can occur but recombinants of the two types have not been reported.
- Subtype C is the most predominant subtype globally and is most often seen in Southern Africa and the Horn of Africa. It is also observed in India and China.
- Subtype A is commonly seen in Central, West and East Africa.
- The predominant subtype in Nigeria is the A/G recombinant, also called Circulating Recombinant Form_02/A/G or CRF_02/A/G.
- The subtype in Western Europe and North America is the subtype B. Most of what we know about HIV-1 comes from studies of HIV-1 subtype B.
- Most of the diverse groups of known HIV-1subtypes have been found in Africa. All HIV-1 subtypes have been reported in Central Africa.

## Activity 7: Pathogenesis of HIV

*(Mount the transparencies on the pathogenesis of HIV. This would enhance participants' understanding)*

- Only 30-70% of primary HIV-1 infection is associated with acute clinical symptoms ranging from a mild viral syndrome to a severe systemic illness.
- The incubation period from initial infection to onset of symptoms is an average of 21.4 days.
- The initial symptoms are self-limiting and resolve within 1-2 weeks.
- HIV-1 viral load in the blood peaks in the first 15-30 days concurrently with a drop in CD4 cell count and an increase in CD8 lymphocytes
    - The CD8 cells are killer cells which are produced to kill foreign bodies through the production toxins. These killer cells are produced as a response to the presence of the HIV.
    - The CD4 cells are known as helper cells. They stimulate B lymphocytes to produce antibodies against the virus. Unfortunately, most of these antibodies are not effective against the virus. The antibodies they produce against the virus, forms the basis of a number of laboratory diagnostic tests.
- Following primary infection, there is widespread dissemination of the virus. An immune response is established with a rebound increase in the level of CD4 lymphocyte count. The count however, does not return to pre-infection level.
- Seroconversion occurs between 2 – 12 weeks after the onset of initial symptoms.
- Together with the symptomatic period, this time frame is in the order of 3 – 12 weeks. During this period, an antibody test for the virus will be negative. This is known as the *window period*.
- After the acute retroviral syndrome, clinical symptoms subside and patients enter a clinically latent period of the disease. This period of *clinical latency* varies with the median time being estimated as 7-10 years. During this period, the amount of HIV (the

viral load) in the peripheral blood is relatively low compared to that in lymphoid tissues; the viral load increases as the disease advances. Also, the CD4 cell count gradually decreases in number because they are destroyed by the virus.

- Eventually, the immune system is overwhelmed .
- The hallmark of HIV-1 infection is the depression of immunity caused by destruction of the CD4 cells. The normal signals from the helper T-cells to monocytes, cytotoxic T lymphocytes, delayed typed hypersensitivity T cells, T suppressor cells and natural killers cells are lost or reduced. The patients are therefore at increased risk of developing infection which the body could otherwise have coped with. These are referred to as *opportunistic infections.*
- In most cases, HIV-1 progresses from primary infection, to asymptomatic period and then to symptomatic period and finally to AIDS.

## Summary:

This session has tried to update participants understanding of HIV/AIDS. This includes the facts that

- The origin of HIV-1 is still unknown
- The main mode of transmission in Nigeria is through heterosexual sex
- The virus infects cells that have the CD4 molecule and appropriate coreceptors.
- The progress of HIV-2 infection is much slower than HIV-1
- The most common form of the HIV-1 virus in Nigeria is CRF_02/A/G recombinant
- Nigeria is the third worst affected nation in the world

## Activity 8: Group work

Participants would watch a film which shows the ravaging impact of HIV infection and its implications for everyday living

# Module 2

# Theme: Strategies for Prevention and Control of HIV

## Goal

Participants will be exposed to the effective use of available preventive and control strategies that can reduce the spread of HIV infection.

## Objectives

1. Understand the determinants of HIV transmission
2. Discuss an overview of preventive and control strategies
3. Describe strategies that have been successful in other countries.
4. Explain the future of HIV/AIDS prevention and control

## Content

- Determinants of HIV transmission
- Preventive and control strategies
- Strategies used successfully in other countries
- Future control options

## Methodology

- Lecture/discussion
- Brain storming (experience sharing)

## Material needed

- Overhead projector
- Data/Multi-media projector
- Transparencies
- Flip-chart & flip-chart stand
- Markers (colored)
- Masking tape
- Lap top
- Diskettes/other media storage devices

## Activity 1: Determinants of HIV Transmission

The session will be discussing the role of behaviour in HIV infection and the prevention of occupational health hazards in HIV control

*Time: 30 minutes*

## Activity 2: Preventive and control strategies

The session will focus the role of awareness creation, female and male condom use, behaviour change promotion, VCCT promotion and socio-cultural change in preventing and controlling HIV.

*Time: 10 minutes*

## Activity 3: Strategies for HIV control and mitigation

The session will discuss the role of advocacy, safe blood initiation, health insurance policies, legal and policy reforms in controlling and mitigating the impact of HIV.

*Time: 20 minutes*

## Activity 4: Voluntary Counselling and Confidential Testing

The session would highlight the basics of voluntary counselling and testing as well as enumerate the pertinent points especially with reference to ARV management

*Time: 10 minutes*

## Activity 5: The future of HIV prevention and control

The lecture will highlight present research efforts in ensuring that the 90% global population presently uninfected with HIV remain uninfected. It would also discuss global and national efforts in developing new HIV prevention technologies and the role of nurses in facilitating its uptake when developed.

*Time: 20 minutes*

## Activity 6: Group work

# Lecture/Facilitator's notes

## Introduction

The facilitator shall introduce the goal and objectives of the module. Together with participants, the risk factors and impact of the epidemic in Nigeria would be identified and possible intervention strategies S (he) would then introduce the resource person.

*Time: 5 minutes*

## Activity 1: Determinants of HIV transmission

- HIV/AIDS has developed under diverse conditions around the world with consequent variations in the mode of transmission and the rate of transmission.
- In the industrialized countries, what began as an epidemic among men who have sex with men and then needle sharing drug users, is now increasingly concentrated in poor and marginalized sectors of the population.
- In Eastern Europe, HIV is spreading rapidly among intravenous drug users. In Africa and South Asia, the AIDS epidemic is almost entirely among heterosexual non-drug users. Latin America represents a composite of the industrial and developing worlds both in its economic performance and in its HIV epidemics.
- For low-income countries and for middle-income countries with a significant minority of extremely poor people, poverty and poor health promote HIV, not fundamentally different frequencies of sexual contact or types of sexual behaviour.
- HIV prevalence is highly correlated with falling calorie consumption, falling protein consumption, unequal distribution of income, and other variables conventionally associated with susceptibility to infectious disease, however transmitted.
- Protein-energy malnutrition, iron-deficiency anaemia, and vitamin-A deficiency are widespread in sub-Saharan Africa and have been shown in hundreds of studies to decrease disease resistance by weakening physical barriers, humoral immunity, and cell-mediated immunity. Examining the immune system at the cellular level highlights the role of malnutrition and parasitosis in vulnerability to specific diseases, in particular to STIs.
- Vitamin A, for example, is important for epithelial integrity, playing an important role in protecting from STIs, particularly of the ulcerative type, that facilitate HIV transmission.
- Malnutrition and the synergistic effects of infectious and parasitic disease increase the risk of contracting HIV with each sexual contact, regardless of the number of contacts. HIV is opportunist, as are other infectious diseases, and finds fertile ground in malnourished persons.

### Economic determinants of heterosexual HIV

- Poverty of the majority is a major factor that keeps HIV infection going.
- In the *World Development Report* rankings of GNP per capita, African countries, including Nigeria, rank very low. In addition, the sub Saharan countries have one of the most unequal distribution of income in the world; the top ten percent receives almost three times the income of the next decile with extreme poverty of the bottom 20 to 40 percent of the population. The bottom 20 percent receives less than 3 percent of the national income. The under-five mortality rate is high. Education levels for women are extremely low. All these factors promote vulnerability, including

poverty and lack of education, health services, and access to land, which stimulates temporary labour migration.

## Malnutrition

- Considering the importance of nutrition in overall health, there are surprisingly few aggregate data on levels of macro- and micronutrition.
- Estimates show that for children less than five years of age, over 10 percent were having protein-energy malnutrition.
- However, rates of stunting, wasting, and psychomotor problems in children are not only much higher than official data indicate, but are even more severe in children between five and twelve, an age group that is less often studied.
- Vitamin-A deficiency varies by socioeconomic class. Iron-deficiency anaemia affects more than 50 percent of the population in some countries in the region, affecting work capacity, resistance to disease, and maternal and foetal survival.
- Almost all the countries of Africa have insecure food systems so that even when supply is adequate, undernutrition is still widespread. This therefore increases the severity of HIV infection and associated complications

## Parasitosis

- Safe supply of drinking water is still lacking for rural and periurban populations throughout Africa, and almost 90 percent of sewage is dumped directly into streams and rivers untreated.
- Intestinal helminths affect 20 to 30 percent of the general population of all the countries in the region and 60 to 80 percent of people in highly endemic regions.
- If the data were collected by income class, it would show that virtually 100 percent of children in poor neighbourhoods, without clean water and sanitary services, have intestinal helminths. The heavy parasite load in children and adults plays a dual role in disease susceptibility.
- Diarrhoeal infections are the most important cause of malnutrition. Secondly, parasite infestation chronically activates the immune system. In both ways, parasitosis weakens the immune response.
- Malaria infection plays a very important role in immune suppression in Africa. Malaria is endemic in the region. Malaria is the single most important factor in iron-deficiency anaemia in endemic zones. This leads to greater susceptibility to infection and increased likelihood of delivering an underweight baby who will face a life-long disadvantage in immunosuppression

## Labour migration and dislocation of populations

- Among the results of rural poverty and are urbanization and short-term labour migration, both internal and international.
- The pace of urbanization is rapid in Africa. Several countries also have had steady streams of international labour migrants,
- Temporary migration is very common; migrants, mostly men, spend a few years in the United States or Europe, sending money home to build houses or start small businesses.
- Data on temporary internal migration are scant, but pointers indicate that over 80 percent of men between the ages of 20 and 35 migrate, mostly to urban region like Lagos and Portharcourt, for work. They apparently bring home STIs, according to data

from women's gynaecological examinations of populations due to war and natural disasters with attendant effects on health status and social cohesion.

## Lack of access to health care and medicines

- In Africa, an important cofactor for HIV is untreated STIs due to lack of access to health care and lack of medicines.
- Some countries had good public health systems in the past, but have let them deteriorate.
- In Nigeria for example, decades of economic decline and policies of the military administration left the public health sector in disarray and the population burdened with infectious and parasitic disease.
- Health centers and public hospitals lack medicines, sterilizing equipment, sinks for washing hands, and reagents for testing blood..
- Some countries do not have adequate public health facilities, especially in the rural areas, and so STIs that can act as cofactors remain undiagnosed and untreated.
- Even where there are facilities, there are no labouratories.
- In cities, most hospitals do not follow an accepted set of norms.

## Prostitution

- As in many countries, poverty, abuse, and lack of alternatives drive people into prostitution.
- The economic vulnerability of the sex worker makes negotiating safe sex extremely difficult, except where sex workers are organized.
- Most sex workers in Africa and Nigeria are on the street, and children in particular are increasingly at risk especially with the advent of child trafficking. The numbers of people selling sex to live are very high.
- The custom of fathers bringing their sons to prostitutes for initiation continues to contribute to the incidence of HIV

## Street children

- There are an estimated over 20 million children in Africa who work and live on the street, entering the street on average at age 9.
- Street children often engage in "survival sex" with adults to secure food, clothing and shelter.
- Surveys show that many of these sexually active street children had been treated for a sexually transmitted disease and a number are infected with HIV. Over 70 percent of the street girls are prostitutes and yet, do not use condoms.
- Nigeria is noted as a source of child prostitutes for Latin America and European countries
- Governments are doing little to protect the children.
- It is difficult to estimate the extent of sexual transmission of HIV among children aged 10 to 14 because 0 to 14 is the grouping for child infections. In Brazil, however, almost 10 percent of AIDS cases in children aged 12 or younger in 1998 were not the result of mother-to child transmission (UNAIDS, 1999b).

## Lack of awareness

- Lack of AIDS consciousness plays an important role in the spread of HIV.
- In Nigeria, as high as 80 percent of women and 85 percent of men believe they are not at risk of contracting HIV. The tendency and predisposition to use of condom by married women, during sexual contact with their husbands is low.

- Surveys show that less women had heard of AIDS in comparison to men. This however varies with educational level, and rural/urban dwelling.

## Activity 2: Preventive and control strategies

- In Africa, transmission of HIV has been primarily heterosexual and vertical (mother to child) and is highly correlated with malnutrition, unequal distribution of income, and urbanization.
- It is generally in the poorest countries, and among poor people in middle-income countries, that heterosexual and vertical transmission are greatest.
- We can expect that characteristic to become more pronounced in the future. Since the middle-income countries comprise an affluent minority and a poor majority, semi-generalized epidemics – that is, generalized among the poor – are likely.
- In Africa, where there is a heterosexual epidemic, only a few countries have seen falling incidence.
- Preventive policies that emphasize behaviour modification are effective among groups where behavioural factors are most important in the rate of transmission.
- The epidemic is not leveling off in most developing countries with heterosexual epidemics. Where protein-energy malnutrition, micronutrient deficiency, parasitosis, lack of hygiene, lack of health care and medicines, and child abandonment are important factors in HIV epidemics, behaviour-based preventive policies are not enough.
- HIV has become a part of poor people's lives, and the solution to HIV will have to include an assault on poverty and its effects on general health.
- In developing countries like Nigeria, behaviour-modification programs are useful but are not substitutes for economic policies that promote equitable development and health programs that provide preventive and curative care.

## Activity 3: Strategies for HIV control and mitigation

- HIV/AIDS prevention and control programmes should be characterised as broad, cross-sectoral, multi-disciplinary and community based programmes These include:
- Providing equipment for testing of blood and protection of health workers in primary and secondary level health facilities.
- Information, education, communication and training.
  - Prevention through information, education and behaviour modification communication efforts.
  - Prevention through condom promotion.
  - Testing of blood and blood products
  - Voluntary counselling and testing of individuals.
  - Information, education and awareness creation, targeting all age groups and in particular focusing on children and adolescents,
- Feasible, adequate, efficient and effective use of highly active anti-retroviral therapy (HAART) for persons with HIV/AIDS
- Feasible, adequate, efficient and effective prevention of mother to child transmission programmes
- Provision of peer outreach activities
- Community and home based care and support for orphans

- Provision of social support to persons infected or in other ways affected by the epidemic. Including micro-credit schemes
- Gender specific programme designs
- Human and legal rights as well as advocacy
- Development support for
  - Peace and reconciliation.
  - Access to basic social services, including HIV/AIDS.
  - Food security.
  - Disaster preparedness.
  - Emergency and rehabilitation assistance to refugees and internally displaced persons.
  - Risk education and support.
- There is increasing interest in harnessing the potentials of HIV related clinical trials to address the issue of focused prevention counselling and increasing assess to ARV treatment. New prevention technology related clinical trials have noted up to 50% decrease in risk behaviour of persons who practice high risk behaviours

## Activity 4: Voluntary Counselling and Confidential Testing

- Voluntary counselling and confidential testing is not an end point in itself but an essential link and an entry point to prevention, care and support services.
- Voluntary counselling and confidential testing is not an end point in itself but an essential link and an entry point to prevention, care and support services.
- If this link is well established and the services provided meaningful, then VCCT services can be a powerful catalyst towards increased prevention, care and support and vise versa.
- People who test positive can gain prompt access to medical care, health information and ongoing psychosocial support services
- Those who test negative can continue to receive services that enhances their ability to stay negative
- VCCT therefore facilitates early and prompt access to effective referrals which helps to prevent infection and enhance the quality of life of persons who test positive
- Such services include; health information that promotes and facilitates behaviour change; PMTCT services, access to medical management of opportunistic infections and ARVs, access to support services; as well as services that helps individuals plan for the future (will, orphan care).
- In addition, VCCT is an indirect tool for addressing stigma and discrimination in the community
- It is therefore important that each VCCT centre
  - Network with other service providers
  - Counsellors need to be able to make holistic assessment of client's need and draw up an individualised care plan to address this. The care plan outlines the client's daily living activities, specific needs and means of addressing them.
  - Counsellor should be able to communicate the need for ongoing counselling for all clients as well as the need for accessing medical and social services promptly
  - VCCT service centres should be accessible and should access both infected and affected persons

# Activity 5: The Future of HIV Prevention and Control

## Preventive vaccine

- The success achieved in the eradication of smallpox and polio (only pockets of polio exists in few countries worldwide presently) and the significant reduction in morbidity and mortality associated with other diseases such as measles, yellow fever and chickenpox has encouraged the initiative for the development of an HIV vaccine
- A vaccine presently presents the only long term hope for a control of the infection as behaviour control has recorded limited success in the last 20 years of the infection
- A vaccine would also be cheap, affordable and possibly accessible by many when it is eventually developed
- HIV vaccine research has been going on for some years now. There are ongoing trials in African countries such as Botswana, Kenya, Uganda, South Africa
- The process of developing a vaccine is however long. This is because, time is needed for
  - Laboratory development of potential candidate vaccine
  - In vitro testing
  - Animal testing
  - Human testing
    - Phase I for safety and immuno genicity in 20 – 50 volunteers
    - Phase II for additional safety, immuno genicity, dose finding, route of administration and vaccination schedule in a few hundred volunteers
    - Phase III for efficacy against infection or disease in a few thousands of volunteers
- All over the world, there is testing of candidate vaccines in various stages of trials. Multiple studies are necessary because of the potential need to develop specific HIV strain-related vaccines at this initial stage and then work towards the development of a globally acceptable vaccine which can work against all strains of HIV-1
- Nigeria has its own HIV-1 vaccine development plans and would hope to join global efforts within the next two years

## Microbicides

- Microbicides are substances that can be applied in the vagina so as to reduce the risk of infection from HIV-1 and other STIs as well as prevent unwanted pregnancies
- It does not eliminated the need for condom but it empowers people whose partners would not use condom or cannot use condom
- A microbicide kills microbes, viruses and bacteria.
- There are no microbicides available that have been proven safe and effective for destroying HIV-1, and as a result, HIV-1 transmission prevention depends on condom use (either male or female).
- A microbicide could be inserted into the vagina in the same way that spermicide foams are used to prevent pregnancy, and would be a woman-controlled HIV-1 prevention method.
- Microbicides are in development, and with adequate financial support, could be available on the market in 2-5 years.
- There are various types of microbicides that have been developed for both
  - Vaginal applications: Some products that have been tested for vagina use are
    - Carraguard
    - Buffer gel
    - PRO 2000

    - Cellulose Sulfate
  - Rectal applications
    - This is important so as to protect individuals involved in anal sex
    - Products for rectal application may need to be different from that of vaginal application because
    - The rectal lining is more fragile than the vagina lining
    - The rectum is richer in CD4 receptors, cells particularly vulnerable to HIV-1 infection, than the vagina
    - The ecology of the rectum differs from that of the vagina
    - The vagina is a closed pouch while the rectum is an open ended cavity and thus may need greater quantity of the microbicide for use
- Four different approaches to protection are under study:
  - Broad spectrum
    - In the broad spectrum approach, all microbes present in the semen are destroyed.
    - An example of a broad spectrum microbicide is a buffer gel.
    - A buffer gel works by keeping the vagina at a low pH during and after sex.
    - A quick chemistry review: low pH means acidic (like lemon juice or vinegar). HIV-1 prefers a basic environment, that is, an environment with a high pH. So if the vagina is kept at a low pH after ejaculation, the HIV-1 can be destroyed.
  - Inhibitor of viral entry
    - In the inhibitor of viral entry approach, HIV-1 is prevented from infecting the cells of the vaginal wall and cervix.
    - One such method is the "invisible condom." A substance is inserted into the vagina, and body heat causes the material to thicken, creating a barrier to HIV- 1
  - Inhibitor of viral replication
    - This involves the use of anti-HIV medications in the vagina.
    - This method may be useful for people who wish to get pregnant, as the medications would be active against the virus but might not necessarily destroy the sperm.
  - A combination approach.
    - A combination approach would involve the use of a broad spectrum method plus an inhibitor of viral entry method for maximum effectiveness against HIV-1.

- Currently, there are twenty microbicides in preclinical development (in the laboratory) and twenty-three products in various stages of clinical trials.
- The development of one product can cost up to $50 million.
- Microbicides could be produced as
  - Gels
  - Foams
  - Creams
  - Suppository
  - Sponge
  - Vaginal ring
  - Vaginal wipe

## Effectiveness issues of microbicides

- Pharmaceutical companies are hesitant to join the development effort because of liability issues, and current government funding is not adequate to ensure timely availability of these products.
- However a number of products are at various stages of clinical trials. These include those in:
  - Phase I which are initial safety trials of the product in question
  - Phase IIa is a pilot clinical trial to evaluate efficacy and safety
  - Phase IIb is a pivotal trial that must adhere to a rigorous demonstration of efficacy
  - Phase IIIa is conducted in the target population
  - Phase IIIb deals with quality of life and marketing issues
  - Phase IV focuses on issues that arise once the product is marketed and is based on observation or experience of the target population.
- Currently, there are 14 microbicide product leads in the pre-clinical phase.
- Six product leads have completed Phase I trials
  - Cellulose sulphate
  - PMPA
  - PSS
  - CSIG
  - Acidiform
  - DS
- Three products have completed Phase II trials
  - Carraguard
  - Lactobacillus crispatus
  - PRO 2000- with Phase III trials planned to begin soon.
- Only two products have undergone phase III before
  - N-9 based products - that have been discontinued as N-9 has been shown to increase the risk of HIV acquisition.
- The next three to enter Phase III trials, however, have more hopes pinned on them
- Hopefully, by 2007, the first microbicide should be in the market
- Nigeria has also been involved with trials
  - There are Phase III Savvy trials going on in Lagos and Ibadan
  - There are Phase III Cellulose sulphate trials in Lagos and Portharcourt
  - There are plans to start a Phase I TMC120 trial in Abuja and Vivagel trial in Sagamu

## Activity 6: Group work

- Group discussion and presentation of preventive strategies
- Condom demonstrations.

# Module 3

# Theme: Voluntary Counselling and Confidential Testing

## Goal

To promote behavioural change in the prevention of HIV infection and its transmission to other people and give psycho-social support to those whose live or affected by HIV.

## Objectives

1. Understand the importance of counselling and good communication skills in the management of PLWHA
2. Discuss the counseling process
3. Demonstrate counseling skills through role play

## Content

- Definition and types of counseling
- Characteristics of a good counsellor
- Counselling process
- Counselling in special circumstances
- Behavioural change models

## Methodology

- Lecture/discussion
- Role play
- Brainstorming
- Group work

## Materials Needed

- Overhead projector
- Data/Multimedia projector
- Transparencies
- Flipcharts and flipchart stand
- Markers
- Masking tape
- Laptop
- Diskettes/Other media storage devices

## Activity 1: Definition and types of counselling

Participants will be introduced to the principles and philosophy of non directive counseling, they will also introduce to HIV/AIDS counselling. The concepts and key issues for each type of HIV/AIDS counselling will be highlighted and discussed.

*Time: 20 minutes*

## Activity 2: Characteristics of a good counsellor

Skills needed for providing counselling will be identified and so would the attributes of a good Counsellor.

*Time: 20 minutes*

## Activity 3: Counselling process

The rules governing effective counselling and its result of effective counselling will be enumerated and discussed.

*Time: 20 minutes*

## Activity 4: Counselling in special circumstances

Participants would learn how to deal with some envisaged possible difficult moments/special circumstances in counselling. These are counselling situations that may be uncomfortable and difficult to handle. Trainers would demonstrate how to handle some of these difficult moments

*Time: 30 minutes*

## Activity 5: Group work

# Facilitator's/lecturer's notes

## Introduction

The facilitator will introduce participant to the goal and objective of the module. The importance of participants understanding the basics of counselling as an important prelude to handling clients who would be taking ARV drugs would be discussed. Ideally, all PLWHAs should have had pre and post test counselling at diagnosis and would need ongoing and possibly bereavement counselling in the future. The resource person for the session will then be introduced

*Time: 10 minutes*

## Activity 1: Definition and types of counselling

- Counselling can be defined as a process of helping clients come to make informed decisions about issues that concerns them
- It is a tool used to help clients make informed decisions about their health and life.
- This is a skill by which feedbacks on issues are received and given
- The focus of counselling is on helping the client take their own decisions to solve their own problems.
- This is different from advising or giving instructions
- The primary aim of counselling is to assist clients to explore their feelings and thoughts and to understand themselves better. In so doing they gain the ability and strength to live healthier lives, to make and evaluate their own decisions and to take positive action. It enables people to feel they have more control over their lives.
- There are different types of HIV/AIDS counselling. These are pretest, post test, ongoing, preventive and bereavement counseling etc.
- Points to note during a **pre-test** counselling session includes:
  - Client's reason for requesting screening
  - Explore client's knowledge about HIV/AIDS
  - The what and how of HIV testing
  - Assessment of risk behaviour. This includes:
    - History of past and present high risk behaviour such as drug injections usage, commercial sex workers, bisexuality, having sex with the same gender, multiple sexual partners, unprotected sex
    - History of blood transfusions
    - Skin cutting and piercing procedures such as tattooing, circumcision and scarification.
    - Client's medical history in respect to sexually transmitted infections.
  - The meaning and implications of either a positive or negative test result must be properly explained to the client
  - Who might the client want to share the information of a positive result with.

### Post-test counselling

- For all people who have been tested whether positive or negative, ALL clients must come in to get their results personally.
- Counselling should also be available to the family and associates of the client.

- For a negative result it is important to reiterate to the client the modes of transmission, the need and how to protect oneself and the need to avoid indulging in high-risk behaviour.
- For a positive result great sensitivity is needed in giving the information and beginning to help the client come to terms with the result. The following are some of the reactions to expect from a positive client.
  - **Shock -** Confusion and bewilderment are typical. Some react courageously, while others lose emotional control.
  - **Denial -** The client may deny the situation. S(he) feels the result is not true or a mistake; it cannot be happening to them.
  - **Anger** - Anger directed at oneself; the perceived person who infected them; the counsellor; the doctors or nurses; family and friends; life in general and how unfair it is. The counsellor must help the client deal with this and allow the expression of anger, as it is very natural, even if not very focused. It is a healthy way to deal with the situation provided it is channeled properly. The counsellor helps the client to redirect their anger and motivate them to respond constructively to the challenges the illness presents. This takes time and may take several weeks/months as the client goes through the process of coming to terms with the situation.
  - **Depression and fear of illness or death** - Some dramatic incidents are to be expected as natural reactions to a frightening and life-threatening illness like HIV/AIDS. Relative cheerfulness can give way to continued feelings of hopelessness, sadness, fatigue, apathy, bouts of depression, changes in sleeping patterns, eating habits, feelings of self-blame, guilt and worthlessness.
  - **Acceptance –** unusually, the client may not express any negative emotions. Some simply accept the test result. This may happen with clients who are already anticipating positive results.

**Preventive counselling**

- This is generally aimed at prevention of infection.
- It involves the counsellor giving full and accurate information on HIV/AIDS, modes of transmission, stages of infection and its implications and the means of prevention.

**On-going counselling**

This helps clients:

- Come to terms with the illness
- Stay healthy for a long time
- Handle periods of frequent illness
- Identify who to tell, why, when and how – (spouse, partner(s) children, parents, friends, colleagues at work, employer etc).
- Prepare for living and dying
- The counsellor may also help provide support, friendship and advocate for client during this period.
-

### Bereavement counselling

- There are typical stages that most people go through when confronted by sudden, unexpected loss and tragedy.
- These stages are:
  - alarm/threat
  - impact of the news, event
  - searching/taking stock of the effects/ how does it affect others and me?
  - gaining a new identity/rescue and recovery/moving on
- Feelings during bereavement include::
- shock
- denial/guilt/anger
- withdrawal/depression
- sadness/ acceptance
- The important thing is to be able to accept the bereaved person with all their ambivalences, contradictions and complexities.
- In accepting and understanding the stages of grief, you can give reassurance that while each grief/tragedy experienced is personal and unique, the person experiencing it is not abnormal in the ways that they express themselves

## Activity 2: Characteristics of a good counsellor

### Attributes of a good counsellor should include being:

- a good listener
- confidant
- able to relate well with people
- able to respect client
- observant
- patient
- trustworthy
- knowledgeable
- able to understand client's problem
- accommodating

### Skills needed by a good counsellor are:

- Listening skills (verbal and non-verbal): These are done using the
  - eyes
  - heart
  - ears
  - It is perhaps the most essential skill used in counselling.
  - It is an active, not passive process.

- One listens by:
  - Making appropriate eye contacts. Eye contact makes the client understand that s(he) has your unwavering attention. It also enables you as a counsellor to pick up non-verbal clues.
  - Reading the body language. Body language is important as it can tell us a lot about how someone is feeling. It may also give a different message from the one

the client is actually saying. Therefore it is important for the Counsellor to be aware of this difference and what it might mean.

- The use of appropriate trunk lean, gestures that may connote interest in the client as well as appropriate use of facial expressions. This helps to further elicit information from the client
- The use of Encouragers are simple but powerful forms of active listening closely akin to body language, in which verbal and non-verbal signals are given to encourage the client to speak, to keep talking or to express their feelings. These small signals are vital, if unobtrusive, and are indicators to the client that you are listening, interested and pleased that s(he) is expressing him/herself.
- Reflecting back on the meaning of what the client has expressed, either in regard to facts or feelings, is a useful technique for encouraging the client to continue talking and expressing feelings

- **Empathizing**- This shows that you understand and heard what the client is feeling from her/his point of view. It differs from sympathy
- When you sympathize you are sorry for the person, but from your own point of view.
- With empathy you reflect on the client's feeling and the client remains the focus of attention. With sympathy, the focus is removed from the client to you. This is usually unproductive and results in negative outcomes
- The use of effective listening skills by the counsellor is central to this process and forms the crux of counselling.
- Through the use of attending skills, encouragers, reflections and summarizing the counsellor gives undivided attention to the client and positively encourages them in a supportive and non-judgmental manner.
- This allows the client to safely explore their feelings and concerns and provides the opportunity for healthy change.

## Activity 3: Counselling process

### The don'ts of counselling should include don't:

- interrupt the client
- undermine the client's problem
- impose your own values
- judge
- advise
- discriminate
- be aggressive

### Effective counselling:

- helps to explore self
- helps to vent feelings
- allays fear
- helps client to make informed decision
- helps to correct misconceptions
- promotes healthy living
- promotes positive behavioural changes
- gives a ray of hope
- helps reduce the spread of the infection

### General guidelines for effective counselling

A counsellor must:

- be able to control his/her emotion
- must not be judgemental
- accept the client as an individual
- not take decisions on behalf of the client
- not assume the burden of another person
- be adequately informed

## Activity 4: Counselling in special circumstances

### Counselling can become a problematic issue due to the following barriers:

- cultural/religious inhibitions
- language barriers
- gender issues/gender discrimination
- lack of trust and confidentiality
- influence of significant others and spouse
- personal attributes of the counsellor
- Difficult moments/special circumstances in counselling sessions are situations where the client or the counselor or both the client and the counselor may find it difficult to handle situations they are faced with.
- Examples of difficult moments in counselling include:
    - Dealing with emotional crisis of client
    - Giving a positive result
    - Silent client (mute client)
    - Handling a Denying client
    - Counselling while stressed/burnout
    - Dealing with an excessively crying client
    - Fear of death and other loses
    - Dealing with a misinformed client

*Culled frpm NE:LA Home Based Care Training Manual*

## Activity 5: Group work

Facilitators would demonstrate the steps involved in counselling. Participants would then practice triads. Each person in the triad should play the role of a counsellor, client and the observer in turn. The role of the observer is vital in giving feedback to the 'counsellor'

# Module 4
# Theme: HIV/AIDS: NURSING PERSPECTIVE

## Goal
Participants will understand how their roles and behaviour impacts on the care of PLWHA/PABA.

## Objectives
1. Increase their awareness on the need for a positive image of the nurse in the management of PLWHA/PABA.
2. Understand the link between stigma and discrimination in care of PLWHA.
3. Update participants' knowledge of universal precautions and its application in patient care including implications of non compliance.
4. Demonstrate understanding of clients'/patients rights in the health care setting.
5. Apply ethical principles in addressing issues associated with management of PLWHA/PABA.

## Content
- The nature and philosophy of nursing
- Stigma/Discrimination in the health care setting
- Universal Precautions
- The Rights of the Client
- Ethical/Legal issues associated with management of PLWHAs.

## Methodology
- Lecture
- Discussion
- Group work

## Materials required
- Overhead Projector
- Data/Multimedia projector
- Transparencies
- Flipcharts and flipchart stand
- Markers
- Masking tape
- Laptop
- Diskettes/Other media storage devices

## Activity 1: Nature and Philosophy of Nursing

Participants would once again identify themselves as a professional with unique function. Also, the nurse's attitudes to patient care and their role as members of health care team would be discussed. Finally, strategies for positive attitudinal change in the provision of quality care to PLWHA/PABA would be discussed.

*Time: 40 minutes*

## Activity 2: The Rights of the Client

Participants will understand and respect the rights of patients while focusing on PLWHA/PABA.

*Time: 40 minutes*

## Activity 3: Universal Precautions

The principles of universal precautions, the implementation and the risk of non-compliance will be discussed.

*Time: 40 minutes*

## Activity 4: Addressing Stigma/Discrimination in the Health Care Setting

Participants will have a better understanding of stigma/discrimination, their sources, determinants, manifestations and support systems.

*Time: 40 minutes*

## Activity 5: Ethical/Legal Issues

Participants will appreciate the ethical/legal issues associated with the care of PLWHA as well as nurses/midwives moral and ethical responsibilities in patient care.

*Time: 40 minutes*

## Activity 6: Group work

# Lecture/Facilitator's notes

## Introduction

The facilitator shall introduce the goal and objectives of the module. The goal of the module is to ensure that the Nurse understands how her behaviour and her role impacts on the care of PLWHA/PABA. The session would introduce participants to the place and role of the nurse within the ARV therapy management team as well as identify the need for their function and their importance in ensuring the health and well-being of all patients including PLWHA. S(he) would then introduce the lecturer who would take participants through the content of the module.

*Time: 5 minutes*

## Activity 1: Nature and Philosophy of Nursing

- There are varied definitions of nursing. These include:
  - Nursing is defined as the diagnosis and treatment of human responses to actual and potential health problems" (ANA, 1980, p.4). This definition has been massaged since 1980 but with expanded explanations.
  - Nursing is an integral part of the health care system, encompasses the promotion of health, prevention of illness and care of the physically ill, mentally ill and disabled people of all ages in all health care and community settings. Within this broad spectrum of health care, the phenomena of particular concern to the nurse are the individual, family and group's responses to those actual or potential health problems (ANA 1980 pg.9 ICN approved).

- The unique function of the nurse is "to assist the individual, sick or well, in the performance of those activities contributing to health or its recovery (or to a peaceful death) that he would perform unaided if s(he) had the necessary strength, will or knowledge. And to do this in such a way as to help him/her gain independence as rapidly as possible". This aspect of her work, this part of her function, she initiates and controls; of this, she is master (Virginia Henderson, 1966).
- Nursing and the nursing interventions frequently find inspiration in the principle of caring. Caring begins when the nurse enters the field of another person's phenomena, perceiving and feeling the experience of the other person, responding in a way that allows the other person to express feeling or thoughts s(he) has been dreaming of conveying.
- Nursing philosophy involves ontology: What is the nature of nursing? Epistemology: what is the nature of nursing knowledge? And ethics: what is the nature of nursing conduct?
- A nursing philosophy reminds the profession of its beliefs and guides, the pursuit of ethical goals in education, in practice, in research and in theory generation.
- There are various nursing philosophy, but one needs to choose one as the right one, decide that all may be right as differing perspectives of the same thing, consider all as partially right, connect all and consider all as complimentary to each other
- A philosophy is a set of principles or beliefs about a phenomenon. To develop a philosophy, it is first necessary to decide the domains of nursing.

- Domains are fields or spheres of activity and influence. For the nurses, it is the central concept of the practice
- What are the domains of nursing? Nurses work with people, this is the primary area of activity and influence. Therefore, people or person is a nursing domain. Understanding and working with a person's environment to enhance the person's well-being is a nursing activity, so environment is a nursing domain.
- The purpose of nursing is to assist people in ways that enhance their level of health, so health is a nursing domain.
- The activities nurses conduct all fall under the one heading of nursing. Nursing then, is the fourth domain. These four domains are also referred to as the metaparadigms of nursing. These domains or metaparadigms of nursing are:

  - Person
  - Environment
  - Health
  - Nursing
- The role of the nurse includes that of a:
  - Patient advocate
  - Counsellor
  - Manager
  - Coordinator
  - Researcher
  - Clinical specialist

## The nurse as a team member

- The nurse interacts with a whole load of people while working within a team. To function effectively with team, there is a need to acquire skills and attributes that would enhance one's ability to dependently yet, independently for efficient performance of functions. The following attributes would help one function effectively within the team as well as with clients
  - Acceptance
  - Sensitivity
  - Empathy
  - Trust
- These attributes are highly necessary for a nurse to function effectively within the ARV management team – for effective relationship with client as well as with other team members.
- In the management of PLWHA clients, the central role of the PLWHA in his/her care must be acknowledged. As an active participant in treatment and care decisions, the PLWHA has a right to choose how s(he) will participate. And this varies from person to person. The nurse must respect this individual's autonomy to decision making. However, the nurse has the responsibility to ensure the PLWHA has the necessary information and tools to make informed decisions.
- In the care of the PLWHA, there are crucial and valuable roles played by volunteers and informal care providers. It is important that the nurse recognize and validate the important role that informal care providers play within the care giving team and collaborate with all to enhance the quality of life of the PLWHA

- The nurse must also learn not to impose his/her own values and beliefs on others but rather support and validate the efforts and values of the team.

## Activity 2: The Rights of the Client

- HIV is a pandemic that constitutes an ever-increasing threat to humanity and affects all communities.

- People living with HIV/AIDS experience multiple losses which are compounded by both poverty and discrimination which constitute a violation of human rights.
- Federal, State and Local Governments play a critical role in ensuring that there is an effective societal response to preventing the spread of this fatal transmittable disease and supporting those already infected. The response of government to individuals and individual rights is a foundation of any response.
- Persons living with HIV/AIDS have the right to realize the full and equal enjoyment of rights and freedoms, without distinction and under all circumstances. Other rights include:
    - Comprehensive protective legislation and anti-discrimination policies.
    - Universal access and choice to a full continuum of care which allows PLWHA to live and die with dignity and grace.
    - Unrestricted access to the therapies chosen.
    - Explicit commitments to an ongoing and continual research agenda that will improve our lives and realize a cure.
    - Confidentiality pertaining to our HIV sero-status and safety in all environments should we choose to disclose.
    - Full involvement in any decision-making process affecting our lives.
    - Sufficient income and adequate housing which enable us to sustain our health.
    - Full freedom of movement, travel, mobility and migration.
    - Express our sexuality.
    - Absolute control of our reproductive choices.
    - Remaining the parents of our children and continuing to be the children of our parents.
    - Full access to information and services that reflect our needs and that are based on our language, literacy and cultural background.

- Ensuring the quality of life and health of persons with HIV/AIDS is a fundamental responsibility of government. Federal, State and Local. Governments have critical roles to play.
- These rights should be respected and safeguarded.

## Activity 3: Universal Precautions

- Universal precautions are simple infection control measures that reduce the risk of transmission of blood-borne pathogens through exposure to blood or body fluids among patients and health care workers.
- Under the “universal precaution” principle, blood and body fluids from all persons should be considered as infected with HIV, regardless of the known or supposed status

of the person. Improving the safety of injections is an important component of universal precautions.

## Why it is Important

- Any percutaneous or permucosal exposure to blood or body fluids represent a potential source of HIV infection. These include skin-piercing procedures with contaminated objects and exposures of broken skin, open wounds, cuts and mucosal membranes (mouth or eyes) to the blood or body fluid of an infected person.
- Although they account for a minority of HIV infections, health care procedures represent a highly preventable source of HIV infection. Among health care associated sources of infection, unsafe injections are of particular concern, accounting for an estimated 3.9% to 7.0% of new infections worldwide. In addition, unsafe practices in hemodialysis and plasmapheresis centres have been associated with HIV transmission.
- Health care worker protection is an essential component of any strategy to prevent discrimination against HIV infected patients by health care workers.
- If health care workers feel they can protect themselves from HIV infection, they can provide better care.

## Implementation Strategies

- Ensure universal precautions
  - Use of new, single-use disposable injection equipment for all injections is highly recommended. Sterilizable injection should only be considered if single use equipment is not available and if the sterility can be documented with time, steam and temperature indicators.
  - Discard contaminated sharps immediately and without recapping in puncture and liquid proof containers that are closed, sealed and destroyed before completely full.
  - Document the quality of the sterilization for all medical equipment used for percutaneous procedures.
  - Wash hands with soap and water before and after procedures; use of protective barriers such as gloves, gowns aprons, masks, goggles for direct contact with blood and other body fluids.
  - Disinfect instruments and other contaminated equipment.
  - Handle properly soiled linen. Soiled linen should be handled as little as possible. Gloves and leak proof bags should be used if necessary. Cleaning should occur outside patient areas, using detergent and hot water.
- Ensure adherence to universal precautions
  - **Staff understanding of universal precautions:** Health care workers should be educated about occupational risks and should understand the need to use universal precautions with all patients, at all times, regardless of diagnosis. Regular in-service training should be provided for all medical and non-medical personnel in health care settings. In addition, pre-service training for all health care workers should address universal precautions.
  - **Reduce unnecessary procedures:** Reduce the supply of unnecessary procedures: Health care workers need to be trained to avoid unnecessary blood transfusions (e.g., using volume replacement solutions), injections (e.g., prescribing oral equivalents), suturing (e.g. episiotomies) and other invasive procedures. Standard treatment guidelines should include the use of oral medications whenever possible. Injectable medications should be removed from the national

Essential Drug List where there is an appropriate oral alternative. Reduce the demand for unnecessary procedures. Create client demand for new, disposable, single-use injection equipment as well as increased demand for oral medications.

- **Make adequate supplies available:** Adequate supplies should be made available to comply with basic infection control standards. Provision of single use, disposable injection equipment matching deliveries of injectable substances, disinfectants and "sharps" containers should be the norm in all health care settings. Attention should also be paid to protective equipment and water supplies. While running water may not be universally available, access to sufficient water supplies should be ensured.
- **Adopt locally appropriate policies and guidelines:** Use of sterilizable injection equipment should be discouraged, as evidence shows that the adequacy of the sterilization is difficult to ensure. National health care waste management plans should be developed. The proper use of supplies, staff education and supervision needs should be outlined clearly in institutional policies and guidelines. Regular supervision in health care settings can help to deter or reduce risk of occupational hazards in the workplace. If injury or contamination results in exposure to HIV infected material, post exposure counselling, treatment, follow-up and care should be provided.
- **Negative attitude of health care providers**

## Activity 4: Addressing stigma/discrimination in the health care setting

### Defining stigma and discrimination

- Stigma generally refers to a negatively perceived defining characteristic, either tangible or intangible.
- It is an attribute used to set the affected persons or groups apart from the normalized social order, and this separation implies a devaluation (Gilmore and Somerville 1994)
- In regard to HIV/AIDS, stigmatization may be the presence of the actual infection or it may be based on associated behaviours which people believe leads to infection
- Discrimination on the other hand are the actions or treatment based on the stigma and directed toward the stigmatized (Bunting 1996). The stigmatized find themselves ostracized, rejected and shunned (Alonzo et al. 1995) and may experience sanctions, and harassment.

### Why there is stigma related to HIV and AIDS

- In many societies people living with HIV and AIDS are often seen as shameful.
- In some societies the infection is associated with minority groups or behaviours, for example, homosexuality
- In some cases HIV/AIDS may be linked to 'perversion' and those infected will be punished.
- Also, in some societies HIV/AIDS is seen as the result of personal irresponsibility.
- Sometimes, HIV/AIDS are believed to bring shame upon the family or community. Whilst negative responses to HIV/AIDS unfortunately widely exist, they often feed upon and reinforce dominant ideas of good and bad with respect to sex and illness, and proper and improper behaviours.

## Factors which contribute to HIV/AIDS -related stigma

- HIV/AIDS is a life-threatening disease
- People are scared of contracting HIV
- The disease's association with behaviours (such as sex between men, and injecting drug-users) that are already stigmatized in many societies
- People living with HIV/AIDS are often thought of as being responsible for becoming infected
- Religious or moral beliefs that lead some people to believe that having HIV/AIDS is the result of moral fault (such as promiscuity or 'deviant sex') that deserves to be punished.
- Sexually transmitted diseases are well known for triggering strong responses and reactions. In the past, in some epidemics, for example TB, the real or supposed contagiousness of the disease has resulted in the isolation and exclusion of infected people. From early in the AIDS epidemic a series of powerful images were used that reinforced and legitimized stigmatization.

    - HIV/AIDS as punishment (e.g. for immoral behaviour)
    - HIV/AIDS as a crime (e.g. in relation to innocent and guilty victims)
    - HIV/AIDS as war (e.g. in relation to a virus which need to be fought)
    - HIV/AIDS as horror (e.g. in which infected people are demonized and feared)
    - HIV/AIDS as otherness (in which the disease is an affliction of those set apart)

- Together with the widespread belief that HIV/AIDS is shameful, these images represent 'ready-made' but inaccurate explanations that provide a powerful basis for both stigma and discrimination. These stereotypes also enable some people to deny that they personally are likely to be infected or affected.

- Negative attitudes and behaviours of health care providers have also contributed to the negative images associated with HIV infection. Health care providers are recognized as ‘authentic’ source of information and thus, their attitude to HIV infection is equally mirrored by the community.

## Forms of HIV/AIDS-related stigma and discrimination

- In some societies, laws, rules and policies can increase the stigmatization of people living with HIV/AIDS.

- Such legislation may include compulsory screening and testing, as well as limitations on international travel and migration.

- In most cases, discriminatory practices such as the compulsory screening of 'risk groups', both further the stigmatization of such groups as well as creating a false sense of security among individuals who are not considered at high-risk.
- Laws that insist on the compulsory notification of HIV/AIDS cases, and the restriction of a person's right to anonymity and confidentiality, as well as the right to movement of those infected, have been justified on the grounds that the disease forms a public health risk.
- Perhaps as a response, numerous countries (excluding Nigeria) have now enacted legislation to protect the rights and freedoms of people living with HIV/AIDS and to safeguard them from discrimination. Much of this legislation has sought to ensure their right to employment, education, privacy and confidentiality, as well as the right to access information, treatment and support.
- Governments and national authorities sometimes cover up and hide cases, or fail to maintain reliable reporting systems. Ignoring the existence of HIV/AIDS, neglecting to respond to the needs of those living with HIV infection, and failing to recognize growing epidemics in the belief that HIV/AIDS 'can never happen to us' are some of the most common forms of denial. These denial fuels AIDS stigmas by making those individuals who are infected appear abnormal and exceptional.
- Stigma and discrimination can arise from community-level responses to HIV/AIDS. The harassing of individuals suspected of being infected or of belonging to a particular group has been widely reported.
- It is often motivated by the need to blame and punish and in extreme circumstances can extend to acts of violence and murder.

## Health Care

- Many reports reveal the extent to which people are stigmatized and discriminated against by health care systems.

- Many studies reveal the reality of withheld treatment, non-attendance of hospital staff to patients, HIV testing without consent, lack of confidentiality and denial of hospital facilities and medicines. Also fuelling such responses are ignorance and lack of knowledge about HIV transmission.
- A survey conducted in 2002 among some 1,000 physicians, nurses and midwives in four Nigerian states, returned disturbing findings.

    - One in 10 doctors and nurses admitted having refused to care for an HIV/AIDS patient or had denied HIV/AIDS patients admission to a hospital.
    - Almost 40% thought a person's appearance betrayed his or her HIV-positive status, and 20%felt that people living with HIV/AIDS had behaved immorally and deserved their fate.
    - One factor fuelling stigma among doctors and nurses is the fear of exposure to HIV as a result of lack of protective equipment.
    - Also at play, it appears was the frustration at not having medicines for treating HIV/AIDS patients, who therefore were seen as 'doomed' to die.

- Lack of confidentiality has been repeatedly mentioned as a particular problem in health care settings.

- Many people living with HIV/AIDS do not get to choose how, when and to whom to disclose their HIV status.
- When surveyed recently, 29% of persons living with HIV/AIDS in India, 38% in Indonesia, and over 40% in Thailand said their HIV-positive status had been revealed to someone else without their consent.
- Huge differences in practice exist between countries and between health care facilities within countries. In some hospitals, signs have been placed near people living with HIV/AIDS with words such as 'HIV-positive' and 'AIDS' written on them.

## The way forward

- HIV-related stigma and discrimination remains an enormous barrier to effectively fighting the HIV/AIDS epidemic.

- Fear of discrimination often prevents people from seeking treatment for AIDS or from admitting their HIV status publicly.
- People with or suspected of having HIV may be turned away from healthcare services, employment, refused entry to foreign country. In some cases, they may be evicted from home by their families and rejected by their friends and colleagues.
- The stigma attached to HIV/AIDS can extend into the next generation, placing an emotional burden on those left behind.
- Denial goes hand in hand with discrimination, with many people continuing to deny that HIV exists in their communities. Today, HIV/AIDS threatens the welfare and well being of people throughout the world.
- At the end of the year 2004, 39.4 million people were living with HIV or AIDS and during the year 3.1 million died from AIDS-related illness.
- Combating the stigma and discrimination against people who are affected by HIV/AIDS is as important as developing the medical cures in the process of preventing and controlling the global epidemic.
- So how can progress be made in overcoming this stigma and discrimination? How can we change people's attitudes to AIDS? A certain amount can be achieved through the legal process.
- In Nigeria, a large number of people who are living with HIV/AIDS lack knowledge of their rights in society. They need to be educated, so they are able to challenge the discrimination, stigma and denial that they meet in society.
- Institutional and other monitoring mechanisms can enforce the rights of people living with HIV or AIDS and provide powerful means of mitigating the worst effects of discrimination and stigma.
- However, no policy or laws can alone combat HIV/AIDS related discrimination. The fear and prejudice that lies at the core of the HIV/AIDS discrimination needs to be tackled at the community and national levels.
- A more enabling environment needs to be created to increase the visibility of people with HIV/AIDS as a 'normal' part of any society.
- There is also a need to confront the fear based messages and biased social attitudes, in order to reduce the discrimination and stigma of people who are living with HIV or AIDS.
- Health workers, who are role model in the society, also need to address and eliminate stigma and discrimination of PLWHA within health care setting

# Activity 5: Ethical/Legal Issues

## Ethical principles and implications in nursing care

- Ethics could be defined as the principles based on morality, particularly those dealing with right or wrong, of our action, as rules of conduct for members of a particular profession, as a science of the study of ideal human behaviour: the concepts of good behaviour
- Ethics is based on the following principles, justice, benevolence/maleficence and respect for autonom
- The implication of ethics for the nursing care of PLWHA would be discussed in the following session.

## Consent for Serological Testing

- This implies that the reason why the test is being recommended is clearly explained to the patient in language he/she can understand, and the results are made known to patient/client, and that he/she agrees to this test and understands its significance.
- Nurses must not take blood or collude with other professionals in obtaining blood for named serological testing for antibodies to HIV or HIV antigens unless patient has given consent for this procedure.
- Nurses and other health care professionals should ensure that they have the necessary expertise and training to engage meaningfully in pre and post test counselling.
- Actions aimed at leading patient/client to believe that blood specimens taken for HIV testing were for some other purpose, expose Nurses themselves to possibility of complaints to alleging misconduct.
- If a nurse is unsure as to whether or not patients/clients are being asked for their consent to serological testing for HIV or HIV antigens, he/she should discuss with the medical staff who ordered for the investigation and if necessary seek professional advice

## Duty to Care

- The ethics of the profession embraces the concept that skilled nursing care should be available to all individuals regardless of race, religion, age, sexual or political orientation or disease presentation.
- Nursing personnel do not have the right to decide which patients they will care for and which patients they will not care for.
- All nurses have an individual responsibility to update themselves on management of patients living with HIV/AIDS or HIV related illness.
- Refusal to care for any patient or any HIV/AIDS patient because of perceived risk to self or family will lead to professional misconduct.
- Nursing care of PLWHA should not be judgmental

## Employment of Nursing Personnel infected with HIV

- Protection of the human rights and dignity of HIV-infected persons, including persons with AIDS is essential for the prevention and control of HIV/AIDS.
- Nurses with HIV infection who are healthy should be treated the same as any other Nurses.
- Nurses with HIV related illness including AIDS, should be treated the same as any other Nurse with an illness.

- If a Nurse confides confidential information to a Senior Officer, it may not be disclosed to other management colleagues without the express consent of the affected Nurse.
- Nursing personnel are encouraged to confide the nature of their HIV antibody status or illness to their authority to allow for appropriate support.

## Nurses and Midwives: Moral and Ethical responsibilities

- ICN document on reducing the impact of HIV/AIDS on Nurses/Midwives personnel affirms that the Nurses primary responsibility is to those people who require Nursing Care.
- In situations where HIV/AIDS and human sexuality cannot be discussed openly, Nurses and Midwives often feel embarrassed and uncomfortable about discussing sexual issues. Topics may be totally ignored during health education session.
- Nurses and caregivers should be prepared to break with tradition and to accept and provide counselling and education about these topics.
- Nurses and Midwives must be perceived as competent professionals capable of discussing issues openly and confidently and acting compassionately.
- If Nurses could become the role models for such open and compassionate behaviour others would soon follow their example.
- An important first step in attending to the care needs of PLWHA would be to advocate for compassionate, dignified and competent care for our own infected colleagues.

## Confidentiality

- Like all other patients, PLWHA have the right to the greatest possible confidentiality with regard to their illness and test results. PLWHA has the right to expect that information shared with the nurse and other members of the team will remain confidential both while alive or following his or her death.
- However, strict or absolute confidentiality is not regarded as being either necessary or desirable, e.g. need to inform the spouse or members of the family.
- The general obligation to maintain confidentiality therefore rests on good reason.
- There is need to balance the rights of those in a spousal relationship or those involved in the care of the PLWHA with the threat of discrimination against the PLWHA
- All Nurses have both a legal and professional responsibility to observe their ethical code that concerns confidentiality.
- It is essential that Nurses, midwives recognize the fundamental right of their patients/clients to information about them being kept private and secure.
- The care of confidential information includes ensuring or helping to ensure that record systems are secure (Laboratory test results/medical records) e.g. Storage and movement, for research purposes and or students' clinical assessment

## Other issues on ethics

- The primary mode by which HIV is acquired is via mother-to-child transmission for children and sex for adults.
- Acquisition through blood transfusion, intravenous drug usage, rape, or human bites are possible and account for a number of cases.
- Thus, people mainly acquire HIV in a manner that relates to the survival of families and communities.
- In the attempt to control the HIV epidemic, governments and health care providers risk:
    - being intrusive into personal privacy and families

- being on collision course with communities' survival needs
- antagonizing traditional and religious beliefs
- being overbearing or authoritarian
- in the end, losing the trust and confidence of patients and their families

- In Nigeria, there is no public legislation dealing specifically with HIV/AIDS.
- The existing Public Health Act focuses on infectious diseases, but may be inadequate for HIV/AIDS.
  - It is not clear whether HIV is notifiable or not
  - Yet, coded test reporting is frequently done
  - It should authorize but not require that healthcare professionals DECIDE, whether to inform their patients' sexual partners of the HIV Status of their patients
  - Such a decision to inform should only be made in accordance with the following criteria that - The PLWHA in question has been thoroughly counseled; Counselling of the HIV-positive person has failed to achieve appropriate behavioural changes; The PLWHA has refused to notify, or consent to the notification of his/her partner(s); A real risk of HIV transmission to the partner(s) exists; The PLWHA is given reasonable advance notice; and that follow-up is provided to ensure support to those involved
- Whether testing infringes on fundamental human rights is interpretive and remains a legal minefield.
- It depends on the circumstances of each case and the interpretation of the laws in question.
- Human rights are guaranteed in the Constitution of Nigeria to all persons, regardless of race, place of origin, colour, creed or political opinion.
- These rights are subject only to respect of freedoms of others and public interest.
- The right to life includes the right to live in dignity and safety; subjecting anyone to inhuman treatment is prohibited by the Constitution.
- The right to privacy is meant to protect the dignity of persons, including their honour and reputation. Confidential information relating to HIV/AIDS falls under this right.
- Any violation of the right to privacy must be justifiable.
- However, although the foregoing rights are guaranteed, the rights of other persons exposed to the possibility of infection are not sacrificed in the process of trying to protect the rights of those that are infected
- Detailed guidelines regarding testing are contained in the Ministry of Health Policy on HIV/AIDS and international guideline e.g. UNAIDS
- The following principles should be observed:
  - Testing should not be done without the knowledge of the subject except when screening of blood, in patients presenting with HIV suggestive symptoms and during anonymous surveillance
  - All testing should be voluntary and pre- and post-test counselling should be done in all cases
- The following principles should also be observed:
  - Consent for testing must be given by persons with the capacity to understand after adequate information has been provided
  - Persons with HIV/AIDS should be made aware of their responsibility to prevent onward transmission to others

  - The responsibility of PLWHA to their sexual partners is paramount; penalties are prescribed for deliberate spread
- Generally, information regarding HIV status should be treated confidentially and should not be divulged to others without the consent of the person concerned
- There is no obligation for the employee to inform the employer, however, where an employee feels that sharing the information with an employer or supervisor is helpful, they should be assisted to do so
- The principle of "shared confidentiality" applies to those (usually family) who need to know in order that proper care may be provided. This requires:
  - Timely involvement of family members
  - Making efforts to involve family members during pre-test phase

## Human rights and social justice

- HIV infection has the greatest impact on marginalized populations and groups such as women, sex workers and drug addicts. This aspect of an individual's life must be taken into consideration when providing nursing interventions.
- It is however important for the individual nurse to examine and be clear about one's own beliefs, prejudicial attitudes and limitations
- The nurse then has the responsibility to fight against sexist, racial or cultural prejudices that fuel stigma and discriminatory actions
- It is equally important for the nurse to help ensure that PLWHA have access to care, treatment and support regardless of gender, race, sexual orientation, lifestyle, economic status or place of residence

## Children and the Laws of Nigeria

- The UN Convention on the Rights of the Child enjoins all nations to take necessary measures to protect children from all forms of physical and mental violence, abuse or negligent treatment
- Although this right is not specifically mentioned in Botswana's Constitution, the essence is expressed in the Children's Act
- The UN Convention grants the right to access to health care and requires state parties to ensure such access
- The Constitution of Nigeria does not guarantee the right to health or other socio-economic rights (the right to work and to education)
- Socioeconomic rights are considered difficult to enforce as their enforceability depends on the country's financial capacity
- In conclusion, like adults, children have a right to confidentiality and to be consulted according to their maturity and capacity to understand the issues that pertain to their health

## Conclusion

- The rights of the PLWHA need to be respected. This is because:
- The principle of autonomy guarantees the respect for individual liberty. Patients with HIV/AIDS has right to enter into treatment any stage of care
- While upholding the principle of justice, nurses should ensure that each patient receives care as much as the other. The concern for Justice and fairness is the fundamental principle upon which all laws are based

### Activity 6: Group work

Group work on issues pertinent to Nurse-Patient relationship which will later be presented by either role play or group presentation.

# Module 5

# Theme: Assessment of Patient with HIV/AIDS

## Goal

To collect adequate information about HIV infection from clients to enable one diagnose, plan and manage them effectively.

## Objectives

1. Collect comprehensive data towards establishing HIV infection
2. Develop a treatment plan with the client and adequate follow-up

## Content

- Key points to note when taking history/physical examination using nursing diagnosis frame work
- Key points to note when doing physical examination of patient
- Assessment of patients sexual behaviour
- Laboratory assessment for diagnosis of HIV infection
- Treatment plan and follow up
- Documentation

## Methodology

- Lecture/discussion
- Demonstration

## Materials required

- Overhead projector
- Data/Multimedia projector
- Transparencies
- Flipcharts and flipchart stand
- Markers
- Masking tape

- Laptop
- Diskettes/Other media storage devices

## Activity 1: History taking/physical examination

During this session, participants will identify pertinent information that needs to be recorded when taking a history of a HIV infected patient. In addition, participants will be made to note pertinent examinations to do and to identify signs that will help to increase the index of suspicion for a possible HIV diagnosis.

*Time: 20 minutes*

## Activity 2: Taking history of sexual and individual risk reduction techniques

For the effective and comprehensive management of HIV infection, it is important to document the sexual history of the client. The documentation of sexual history of a client needs appropriate skills. This session will take participants through the methodology of taking a sexual history from clients and identify the required skills needed.

*Time: 20 minutes*

## Activity 3: Interpreting HIV laboratory results

Once a diagnosis is made, laboratory investigations are needed to help confirm the diagnosis. The session takes participants through the necessary investigations a patient will need to undertake to confirm a diagnosis of HIV, and those which will also form baseline investigation for possible commencement of antiretroviral (ARV) therapy. In addition, pointers to help with the interpretation of these results will be discussed

*Time: 20 minutes*

## Activity 4: Using the Nursing Assessment Framework

This session will highlight on the use of the nursing process to make a diagnosis and plan for the management of PLWHA

*Time: 20 minutes*

## Activity 5: Documentation

The session will highlight the need for proper documentation during the management of PLWHA. It will also highlight the various items that need to be documented and the reasons and importance of such documentations.

*Time: 20 minutes*

## Activity 6: Group work

# Lecture/Facilitator's notes

## Introduction

Facilitator will introduce the objectives of the module. S (he) would highlight that HIV-1 infection could be defined by clinical signs and symptoms as well as several laboratory tests. A high index of suspicion is essential for diagnosis. With increasing availability of ARVs, the clinical team in any institution needs to understand the various clinical and laboratory requirement essential for patient management. Questions will be asked at the end of the module. S (he) will then introduce the resource person who would take participants through the content of the module.

*Time: 5 minutes*

## Activity 1: History taking/physical examination:

- The establishment of a good diagnosis starts with a good history.
- The nurse may need to discuss the issue of confidentiality as early as possible while taking the history to help build confidence and trust. Confidentiality means assuring the patient that all information divulged shall not be shared with a third party.
- Nurses should note that assurance of confidentiality is not an allegiance to secrecy because information about the patient may need to be divulged when required and necessary.
- Patients with HIV infection may complain of:
    - weight loss
    - fever
    - pain
    - fatigue
    - recurrent diarrhoea
    - abdominal pain
    - difficulty with eating
    - headache
    - seizures
- A detailed family and social history using the nursing assessment format will help the nurse identify the possible mode of transmission. History of multiple sexual partners, men who have had sex with other men, past history of STIs, transfusion or contact with blood or blood products should be ascertained.
- The past medical history should determine history of: prolonged fever, unexplained weight loss, recurrent cough, persistent frequent stools and oral thrush. These are very significant aspects of the medical history that can aid in making a diagnosis of HIV infection.
- A systemic review would help elicit any other essential information that might have been left out during the history taking process. The attitude of the nurse should be non-judgmental in order to elicit a good history.

### Physical examination:

- The nurse needs to perform a general physical examination before examination of the systems. All systems should be examined.

- During physical examination, it is important to note the following signs and symptoms which may point to the possible diagnosis of HIV infection.
    - shortness of breath
    - chest pain
    - thrush –oral/vulval
    - abdominal pain
    - paraplegia
    - hemiparesis
    - altered mental status
    - wasting
    - fever
    - anaemia
- A combination of the symptoms noted in the medical history above and some of the observed signs should give the Nurse a high index of suspicion of HIV-1 infection. Appropriate laboratory investigations can then be ordered to confirm the diagnosis.

## Activity 2: Taking history of sexual behaviour and risk reduction technique

- Taking a sexual history is an essential prerequisite to adequate examination and management of STIs. Many clinicians express concern about their ability to take a sexual history from a patient and often patients feel embarrassed or ashamed to discuss sexual health issues with their doctor/Nurses.

- Nonetheless, taking a sexual history ensures that the clinician is not making assumptions about the patient and it also allows for an exploration of factors affecting sexual health. Taking a sexual history may also provide the patient with an opportunity to discuss issues that they may not have otherwise raised and it can also allow for the further identification of potentially harmful or risky behaviour.
- The nature of the clinical encounter will determine the timing of sexual history taking. Focusing on the presenting complaint is usual and when this is not related to sexual health, a statement about the standard nature of your subsequent sexual health questions is helpful.
- Below are some pointers to taking a sexual history that may assist the process.

    - Ensure privacy and that the client is seated comfortably.
    - Be non-judgmental and respectful.
    - Avoid making assumptions about people, their sexual identity and their sexual practice.
    - Make eye contact and have a relaxed body language.
    - Provide the patient with a context for the questions that are to follow (e.g. “I am going to ask you some questions about your sexual activity so that we can decide what tests to do
- Clinicians and patients often struggle with their choice of terminology. It can be difficult to determine whether vernacular or more medical terms will make the patient more comfortable or less.

- Generally utilize vernacular and colloquial expressions rather than more technical expressions, though use your judgment as this may make some feel more uncomfortable.
- Adapt your language to the level of understanding of the patient.
- Utilize the language used by the patient, though be cautious as often patients attempt to express issues in medical terms but may get the meaning wrong.

- It may be helpful to check back with the patient that have understood what has been said

- The first question is perhaps the most difficult, so start with a general and less threatening question.
- Questions should be open-ended (do not require a yes or no answers), clear and unambiguous.

- Ask 'how', 'what', 'where' type of questions to explore behaviour.

- Avoid asking 'why' questions as they imply complex understanding of behaviour.

- Do not be afraid to be direct.

- Questions about sexual partners are important as they may be at risk of STIs because of their partner's sexual activity.
- Ask about knowledge and use of condoms as it provides an opportunity for further information and education.
- Finish the session with a general open-ended request for further information. For example "Is there anything else that concerns you?"
- A sexual history checklist should include:

  - Physical symptoms such as nature of problem, length of time and general sexual concerns

  - Previous diagnosis of STIs
  - symptoms and diagnoses in recent sexual partners
  - sexual behaviour such as regular/casual sexual partner contact, last sex contact with other partner(s), number of sexual partners in the last one year, type of sexual contact engaged with each partner, condom use and consistency of use, erectile dysfunction, non consensual sex
  - relationship history such as regular partner, regular partner's sexual activities, casual sexual contacts
  - pattern, forms and frequency of drug and alcohol use
  - drug allergies and current medications

## Activity 3: Interpreting HIV Laboratory results

- The ELISA test is the screening test used for the diagnosis of HIV infection in patients above 18 months. It detects HIV antibodies. It is very sensitive but can also be rarely positive for other diseases such as autoimmune diseases, syphilis, haematological malignancies and pregnancy. This does not make it highly specific since false positive HIV results can be obtained, requiring a confirmatory test.

- A confirmatory test is often recommended for an initial diagnosis of HIV infection in view of false positive results with an ELISA or rapid test. The Western blot test is such a confirmatory test.
    - The western blot has viral proteins that were previously electorphoresed and transferred to the western blot membrane. When reacted with patient sera that are specific to the viral proteins, a series of enzyme detection steps reveal the presence of the viral proteins recognized by the patient's antibodies. If no bands are seen, the Western blot is negative. Control HIV antibody positive and negative sera are usually run with patient sera to insure that the test is working properly.
    - The Western blot could be inconclusive or indeterminate when only few bands are seen during the test.
    - For indeterminate results, the test is repeated two weeks later and periodically for the next six months. If the pattern persists after six months, the individual is not likely to be infected with HIV.
- The Nigerian algorithm recommends that two rapid tests, using different testing formats be used; one for diagnosis and another for confirmation
- Several rapid tests have been developed. These tests detect anti-HIV antibodies much like the ELISA assay. The advantage is that results are available within minutes increasing the effectiveness of post test counselling
- No patient should be allowed to take an HIV test without pre-test counselling.
- Following pre-test counselling, a patient should go voluntarily for an HIV test only when the patient is ready for it. Allow the participants to react to this information; clarify information and answer questions before going ahead with a test session

*(Present the flow chart. this would help increase participants' understanding of diagnosis in the clinical setting)*

## Other required laboratory tests

- The diagnosis of HIV infection cannot be made during the window period through the use of ELISA test. The window period refers to the time for adequate antibody development to the viral proteins, such that standard antibody tests can detect them as positive. Therefore, an ELISA may only be able to detect HIV antibodies 3-12 weeks after initial infection when the HIV antibodies would be present in sufficient quantity for possible detection. The patient can however transmit the virus during this period. A PCR would however detect HIV during this period since this detects viral infected cells present at very low quantities immediately after infection.
- Detuned Elisa can be used o detecting recent HIV sero-conversion.
- There are other rapid HIV test kits including those that use oral mucosa transudates, urine or vagina secretions but they are presently expensive.
- The CD4 cell count may also be required to help with the clinical staging of HIV infection and in making a recommendation for ARV therapy. The CD4 cell count indicates the health of the person's immune system. The normal range is 800 to 1,200 CD4 cells per millilitre. Someone with a measurement of 500 or less is said to be "immune compromised". Anyone with less than 200 CD4 cells and with some sort of opportunistic infection in tow is said to have AIDS
- Where this is not available, a total lymphocyte count can also be used. Clinical staging of the disease could be made based on CD4 cell count or through the use of lymphocyte count in combination with clinical symptoms.
- WHO clinical staging, which does not depend on laboratory parameters, could also be used.

- The viral load measures the number of viruses per millilitre of blood. It is needed as a base line investigation and a monitoring tool. A person who is HIV infected will start to show a viral load that increases from the time that the virus infects the body until the person eventually succumbs to opportunistic infections. People who have viral loads of less than 50,000 are usually not treated with HAART therapy unless their T-cells are extremely low.

The others listed below would be needed for baseline investigations because ARV therapy may affect organ functions. This is because HIV-1 infected individuals may have multi-system disease prior to ARV therapy and may therefore require multiple drug therapies. These must be evaluated.

- Tuberculosis diagnostic tests
  - Sputum microscopy
  - Tuberculin skin testing
  - Chest radiography
- Liver function tests: (These are used in determining the appropriate ARV therapies and monitoring of patients on ARV for hepatotoxicity)
  - Total and direct bilirubin
  - Total protein
  - Glutamic pyruvic transaminase (GPT)/ALT
  - Glutamic oxaloacetate transaminase (GOT)/AST
  - Alkaline phosphatase (ALP)
- Hepatitis B antibodies and antigen and hepatitis C antibody assays
- Pancreatic function tests (pancreatitis is associated with certain ARV drugs)
  - serum amylase
- Lipid profile (certain ARV drugs will lead to abnormal lipid profile)
  - Cholesterol (total, High density lipids and low density lipids)
  - Triglycerides
- Full blood count to help determine the impact of the infection and associated conditions on haematological parameters.
  - ARV drugs like AZT may result in anaemia - many guidelines suggest that patients should not be put on AZT if haemoglobin levels are below 8.5 mg/ml.
- Blood film for malaria parasites
- Electrolytes, urea and creatinine to assess renal function
- Serum chemistry tests should be repeated annually in HIV infected patients and more frequently in patients with abnormal results and in those who are taking antiretroviral drugs with proven haematologic, hepatotoxic or nephrotoxic side effects.

## Activity 4: Using the Nursing Assessment Framework

- The nursing science as applied through the nursing process provides a framework from which nursing interventions are derived. Nursing interventions may have a primary, secondary or tertiary focus.
- In HIV/AIDS care, the involvement of the person is crucial, for often PLWHA, their family and the social network challenge the traditional values and beliefs of many nurses
- In managing any patient including a PLWHA, it is important to collect the health data with which one arrives at a diagnosis and make plans for management
- When doing a baseline assessment for PLWHA, the following should be noted

- chief complaint: the nurse should assess the patient's knowledge about his/her HIV infection including risk factors
- assess patient's coping mechanism
- assess patient's history of treatment and experiences with treatment such as medications, side effects and complications
- prepare with the patient and primary care giver, the short and long term goals of management.

➢ Next, a health history is taken
- do a complete assessment of the past medical history of the patient
- take a STI history and assess if proper treatment and follow up was done
- take a surgical history including laboratory investigations and results
- take a history of current medication including doses and frequency. Allergic reactions and side effects with use of medications should also be noted
- documentation of immunization history is important because of the increasing importance of HIV co-infection with hepatitis
- the family history is important especially with respect to long term management of HIV infection. It is therefore important to rule out possible co-morbid conditions
- take a social history also including sexual history, needle and blood exposure, tobacco and alcohol use, drug use, health insurance travels, exercise and rest. It is also important to have information on the nutritional and occupational history as these are important considerations in client management.
- For a woman, the obstetrics and gynaecological history is important.

➢ Following a health history, it is important to do a review of systems. Care must be taken to ensure that the patient's privacy and comfort is ensured. This would include
- assessing the general appearance
- assessing the skin for lesions and rashes
- ruling out headaches, ear problems, eye problems, nose problems, oral lesions and difficulty with swallowing
- assess the respiratory, cardiovascular, gastrointestinal, genitourinary, musculoskeletal, endocrine, haematological and neurological systems.
- Do a psychiatric and emotional assessment to rule out depression, anxiety, mood swings or a history of mental illness.

➢ A physical examination should also be completed in its entirety at baseline. This should involve all the systems identified for a systemic review

➢ The results of necessary laboratory and diagnostic evaluations needed should be obtained during the baseline assessment and compared with previous results for any possible clinically significant changes. This diagnosis made should include identified etiological factor as well as verbal and non verbal signs and symptoms identified.

➢ A nursing plan includes defining the objective of treatment or expected/desired outcomes of management, identifying specific interventions to be taken to manage the problem and where there is a need for referral, such referral needs are identified. These identified/prescribed interventions would be implemented by the nurse. The nurse would also need to evaluate the outcome of management periodically to assess client's progress towards attainment of expected outcomes.

➢ Interventions for HIV infection could be divided into primary, secondary or tertiary.
- primary nursing interventions are directed towards the health appraisal of persons concerned about or living with HIV infection

- secondary nursing interventions are directed towards health promotion for PLWHA
- tertiary nursing interventions are directed towards minimizing the disabilities related to advancing HIV infection or AIDS and maximizing the quality of life.

- Often times, PLWHA are hospitalized for the management of opportunistic infections and possibly AIDS. Goals of care are to assist with measures to treat the infection, reduce anxiety and fear, maintain comfort, assist the client to cope with the diagnosis and educate him/her about follow up care.
- Prior to discharge, the client should be able to:
  - identify ways to prevent the spread of HIV infection
  - identify ways to decrease the risk of opportunistic infections
  - state signs and symptoms that needs to be reported promptly to the health care provider
  - share feelings about concerns that may result from the diagnosis

## Activity 5: Documentation

### Documentation of Nursing Care

- The professional actions of nurses that are intended to ensure safe and effective care that may affect patient outcomes should be documented in the patients' medical records.
- Nurses in every clinical practice setting should routinely document the quantity and quality of services provided and the estimated effect on patient outcomes.
- Confidentiality of medical data is protected by common law and by constitutional rights to privacy. Confidentiality for the HIV-infected person is a critical issue because of the stigma that is sometimes still associated with the illness.
- Nurses should always take extreme care in nursing care of patients to ensure that confidential medical information is not overheard by other individuals. Information about medications should be disclosed only to appropriate individuals and only with authorized consent from the patient.
- Before counselling anyone other than the patient about care needs, the nurse needs to ascertain that the person with whom s(he) is speaking has been authorized by the patient. Nurses are urged to explore their local and state laws that may apply to the confidentiality of medical records.

### Documentation of Services

- As members of the interdisciplinary health care team, nurses should have access to patients' health records and authority to make entries necessary for the team's coordinated care of the patient.
- With access to the patient's health record comes the nurse's professional responsibility to safeguard the patient's rights to privacy and confidentiality.
- Patients should be informed that nurses, as well as other members of the health team, have access to their records.
- Nurses' documentation in patient records should include nursing care given, drug therapy administered, monitoring of medication effects, patient and family education and counselling activities and other activities as indicated.
- Medication profiles should be maintained and should include information about prescription and non-prescription drug products, dietary supplements, and alternative and complementary therapies.

### Activity 6: Group work

Break participants into two or three groups. Organise a quiz competition amongst the group representatives. Quiz should be based on HIV/AIDS related questions.

# Module 6

# Theme: Antiretroviral Drug Therapy in the Management of HIV/AIDS

## Goal

To introduce participants to Antiretroviral Therapy (ART)

## Objectives

1. Understand the new approaches to antiretroviral therapy
2. Discuss about possible Resistance
3. Discuss nursing consideration in drug administration and adherence
4. Discuss the mechanism, side effects and complication of ARV.

## Content

- Drug classes
- Mechanism of action
- When to start ARV
- Complications associated with antiretroviral use
- Resistance to ARVs
- Patients counselling for Adherence
- Nursing consideration in monitoring and administration of antiretrovirals
- Economic consideration and implications for ARV drugs
- Psychological readiness for the initiation and social support for ARV therapy

## Methodology

- Lecture/discussion, field trip
- Display of ARV drugs
- Brainstorming
- Role play
- Group discussion with PLWHA

## Materials required

- Overhead projector

- Data/Multimedia projector
- Transparencies
- Flipcharts and flipchart stand
- Markers
- Masking tape
- Laptop
- Diskettes/Other media storage devices

## Activity 1: Drug Classes and Mechanisms of Action of ARVs

The resource person will help participants understand the different classes of ARV available, their mechanism of actions, criteria for starting ARV and the side effects.

*Time: 20 minutes*

## Activity 2: Drug-Drug Interactions

The various indications and contra-indications for the use of ARVs will be highlighted during this session. In addition, features and management of drug interactions will be highlighted

*Time: 20 minutes*

## Activity 3: Complications associated with ARV use

This activity will focus on identifying complications associated with ARV use, management of these complications and how to monitor the signs and symptoms of these adverse drug reactions.

*Time: 20 minutes*

## Activity 4: Resistance testing

Participants will be made to understand the need for resistance testing in ARV therapy, including controlling how to clinically identify drug resistance

*Time: 20 minutes*

## Activity 5: Group work

There should be an organized group discussion with people living with HIV/AIDS. Participants will also be able to identify various types of antiretroviral drugs which will be displayed.

*Time: 60 minutes*

# Facilitator's/lecturer's notes

## Introduction

Facilitator will introduce the objectives of the module and give general background information on the ARV programme in Nigeria. Explain that the Nigerian Government presently offers subsidized ARV drugs for persons infected with HIV-1 at the cost of ₦1,000:00 in 25 centers. The list should be presented on a flip chart for participants to be able to refer to it at the end of the session. For the south of Nigeria, these centers are the Nigerian Institute of Medical Research (NIMR), Creek Military Hospital, Ikoyi, Lagos University Teaching Hospital, University College Hospital, Ibadan, University of Benin Teaching Hospital, University of Ilorin Teaching Hospital, Nnamdi Azikwe Teaching Hospital, University of Nigeria Teaching Hospital University of Port-Harcourt Teaching Hospital, Federal Medical Centre Uyo, and Federal Medical Centre Owerri.

For the North the centers are: NIPRD Abuja, National Hospital Abuja, Directorate of State Service Clinic Annex 1 Abuja, National Intelligence Agency Clinic Annex 2, Gwagwalada Specialist Hospital, Central Bank Clinic, Jos University Teaching Hospital, Ahmadu Bello University Teaching Hospital, University of Maiduguri Teaching Hospital, Usman Dan Fodio University Teaching Hospital, Federal Medical Centre Gombe, Aminu Kano Teaching Hospital and Federal Medical Centre Makurdi. There are also some private initiatives on ARV therapy in the country.

These include the provision of ARV at subsidized prices through some NGOs like Centre for the Right to Health, Lagos, Aids Alliance Lagos, StopAIDS Lagos, and NELA Ibadan. There is also a starfish project run by the Olabisi Onabanjo University Teaching Hospital, Sagamu in conjunction with Obafemi Awolowo University Teaching Hospital Ile-Ife. The APIN initiative of controlling mother-to-child infection in 8 centres in Nigeria also entails the use of ARV. There is also the PEPFAR supported programme in 12 sites in 6 states of the federation. Some states do have ART initiatives.

Taking ARV has its implications. The lecture would help participants understand when to start ARV, what are the complications associated with ARV use and what to do when complications sets in. The facilitator should then introduce the resource person.

*Time: 10 minutes*

## Activity 1: Drug classes and mechanisms of action

*(Use the picture prepared on the data projector to help with the teaching of this session)*

- HIV has three viral enzymes: reverse transcriptase (RT), protease, and integrase.

- The currently available anti-HIV drugs have targeted the RT and protease enzymes. However, integrase inhibitors, entry inhibitors, and co-receptor antagonists are under development.
- A sub-class of entry inhibitors that target the fusion process have shown some early promise in human trials.
- The first class of anti-HIV drugs developed were nucleoside reverse transcriptase inhibitors (NRTIs) - each drug functions as an analog of one of the cellular nucleosides. The NRTIs require intracellular kinase phosphorylations to become active and once phosphorylated, they become incorporated into proviral DNA by RT, which results in chain termination.
- NRTIs can also inhibit cellular DNA polymerases, particularly mitochondrial polymerase.
- It is felt that mitochondrial toxicity may explain some of the long-term side effects caused by drugs in this class.
- In contrast to NRTIs, the non nucleoside reverse transcriptase inhibitors (NNRTIs) noncompetitively inhibit the RT enzyme. It is believed that they inactivate the RT by inducing conformational changes in the binding pocket of the enzyme.
- Because of their high selectivity for the HIV-1 RT, NNRTI's are not active against the HIV-2 RT, eliminating this class of drugs for treatment of HIV-2.
- NNRTIs are all metabolized by the cytochrome P-450 enzyme system They have different potential drug interactions as P-450 inducer (nevirapine), inhibitor (delavindine), or both (efavirenz).
- The newest type of reverse transcriptase inhibitors are the nucleotide analogs (NtRTI). The only approved nucleotide for clinical use is tenofovir. Tenofovir is a nucleoside monophosphonate (nucleotide) analog of adenosine.
- HIV requires the viral protease to cleave the translated precursor polyproteins to individual proteins in order to form mature, infectious viral particles. Protease inhibitors (PI) act by blocking the viral protease, resulting in noninfectious viral particles. They work at the last stage of the virus reproduction cycle. They prevent HIV from being successfully assembled and released from the infected CD4 cell.
- Examples of PIs include Saquinavir (SQV), Ritonavir (RTV) {as pharmacoenhancer}, Indinavir (IDV), Nelfinavir (NFV), Amprenavir (APV), Lopinavir-ritonavir, (LPV/r), Atazanavir (AZV) and Tipranavir

## Activity 2: Drug-Drug Interactions

- Potential for drug-drug interactions is significant in the HIV infected patient
- May be an important cause of treatment failure
- Overlapping toxicities may increase the risk of adverse events
- Beneficial drug-drug interactions are increasingly being used to enhance efficacy and reduce toxicity
- Drugs may interact with each other through:
    - Pharmacokinetic mechanisms
    - Body's effect on the drug
    - Alternations of drug pharmacodynamics
    - Drug's effect on the drug
- Pharmacokinetics: Hepatic Metabolism
    - Hepatic metabolism of drugs takes place most often through the more than 25 cytochrome P450 isoenzymes that either oxidise or reduce drugs.

- The cytochrome enzymes are located in hepatocytes, as well as enterocytes in the GI tract
- The P450 3A4 subset is the major enzymatic route of metabolism of the PIs and NNRTIs, and hence a major point of drug interactions
- Drugs may either inhibit (block the activity of) or induce (upregulate the production of) cytochrome P450 enzymes. P450 inhibitors have the potential to increase plasma levels of the other drugs that are metabolized by this pathway
- This may result in the drug's increased effect.
- The protease inhibitors and ketaconazole are all P450 inhibitors: 3A4>2D6
- Co-administration of another drug that is metabolized by the 3A4 subsystem is relatively contraindicated:
- The protease inhibitor may inhibit the cytochrome resulting in elevated levels of the second drug. This is a potentially life-threatening reaction.
- The NNRTIs (Nevirapine and Efiverenz) have some inducing properties
- A P450 inducer increases the amount of the P450 enzyme
- The increased enzyme results in a more rapid rate of metabolism of drug substrates
- For many drugs, the metabolite formed is less active, hence the result will be a decreased pharmacological effect.
- Drugs such as rifampicin or nevirapine activate the P450 system and thereby increase the liver metabolism of drugs that use the P450 system and thus decrease their plasma level very rapidly.

### Management of Drug-Drug Interactions

- Knowledge of drug-drug interactions continues to evolve
- Large number of interactions can be overwhelming to the clinician
- Consideration of drug-drug interactions when initiating therapy + dose adjustments and careful monitoring are important
- A thorough drug history including non-prescription drugs and alternative therapies must be taken at each follow-up visit
- A high index of suspicion regarding drug interactions is needed in the patient with treatment failure, especially if factors such as adherence can be ruled out
- Interactions may be suspected also if patients have serious toxic effects

*Please refer to the National Guideline on use of ARV for more detailed information*

## Activity 3: Complications associated with ARV use

### 1. Lipodystrophy and Metabolic Disorders:

### A. Possible causes

- HIV disease course
  - Duration of infection
  - Disease progression
- ARVs
  - Duration of treatment
  - NNRTIs
  - NRTIs
  - PIs
- Other contributors

- Age
- Sex
- Diet/exercise
- Host genetics
- Immune reconstitution
- Cytokine dysregulation

### B. Risk factors

- Risk of lipodystrophy increases with increased time on ARVs
- Risk of lipodystrophy increases with increase number of non drug factors such as:
  - Age ≥40 years
  - Nadir CD4 count <100 or <15 percent
  - HIV infected >7 years
  - Time since CD4 nadir >3 years
  - AIDS >2 years
  - Hemophiliac

## 2. Mitochondrial toxicities:

### A. Diseases associated with mitochondrial toxicities:

- Leber's hereditary optic atrophy
- Leigh's syndrome
- Encephalomyopathy
- Myopathies and myoclonic epilepsy
- mtDNA depletion syndromes

### B. Clinical features

- Blindness; optic neuropathy
- Spasticity; ataxia; optic atrophy; basal ganglia degeneration
- CNS abnormalities; myopathies with ragged-red fibers
- Myopathy
- Encephalomyelopathies

### Treatment options for complications

- Lifestyle changes
  - Exercise
  - Diet

- Use of Lipid-lowering agents
  - Fibric acid derivatives
  - Statins

- Switching ART
- Drugs
  - Growth hormone
  - Anabolic steroids
  - Dietary supplements

- Hypoglycemic agents
  - Thiazolidinediones
  - Metformin

- Surgical interventions
  - Surgical removal of fat/liposuction
  - Facial implants
  - Fat-transfer techniques

# Activity 4: Resistance testing

## How to identify resistance

Monitor HIV-1 infected individuals through:
Clinical monitoring - resistance may be suspected by the following:

- General sense of ill health.
- Loss of appetite
- Decrease in weight
- Immunological tests
  - Microscope based CD4 systems which counts the CD4 cells. This is called the Enumeration technique (Dyna Beads). This is error prone because there may be contamination with polymorphonuclear cells which gives a false increase in CD4 cell count. However, a false decrease is more common because of the incomplete isolation and lysis of the cells.
  - Flow or laser based cytometry which uses fluorochrome labeled antibodies to count CD4 cells is considered superior but an expensive and technologically advanced technique. . It is automated and less error prone

- **Virological tests**
  - ***HIV 1 quantiplex bDNA*** (Bayer) used to estimate HIV-1RNA in patients. This is a PCR based method that employs probe detection. The test detect all genetic subtypes within group M with equal efficiency. However, HIV-1 groups O and HIV-2 are not detected, also true of other viral load assays such as Amplicor and Nuclisens.
  - ***Amplicor HIV-1 monitor assay*** (Roche) is another RT-PCR based quantitation method for viral copies per ml of plasma. It is more routinely used in clinical trials in the US and Europe.
  - ***Nuclisens HIV-1 Assay*** (NASBA) This test is also based on RT-PCR amplification of viral copies and is very sensitive. It requires only little amount of blood therefore suitable for children and can be stored at room temperature.
  - ***Reverse Transcriptase Exavir Load Assay***. Used to measure reverse transcriptase enzyme therefore can detect all HIV types and groups. A newer assay that has yet to gain widespread acceptance for viral load quantitation.

- **Resistance testing**
  - ***Genotyping assay (sequencing).*** This looks at the presence of genetic mutation in HIV RT and protease gene sequences that may be associated with drug resistance. If the genetic mutations in a person's virus match mutation assumed to confer resistance for a certain drug, then his or her virus is presumed to be resistant to that drug.
  - ***Phenotyping assay (susceptibility testing***). This test directly measures the sensitivity of a patient's HIV in response to particular antiviral drugs. The result of the test

shows the amount of a particular drug needed to inhibit the growth of HIV by 50%. This is a lengthy and expensive test to perform on a patient's virus sample, and is not routinely performed for clinical management.

- **Haematological tests**

Rebound viraemia may suppress bone marrow function though certain ARV drugs are associated with hematologic depression. Investigations include:

- PCV
- Hemoglobin
- Sedimentation rate (ESR)
- WBC – total and differential
- Platelet count
- Reticulocyte count

## Conclusion

- Initiate ARV therapy:
  - When the patient has HIV-related symptomatic disease
  - If CD4 count is <200 cells/mm3
  - When the patient is ready to start
- Individualize and strategize ARV regimens
- Before changing therapies, figure out the cause of viral rebound/failure
- Minimize complications by interventions

## Activity 5: Group work

This session would focus on group discussions with people living with HIV/AIDS. There shall also be a display of various Antiretroviral drugs for review by participants.

# Module 7

# Theme: Strategies of Highly Active Antiretroviral Therapy (HAART)

## Goal

To introduce the participants to the use of HAART and its effectiveness in the treatment of HIV infection.

## Objectives

1. Participants will understand the history of ARV therapy and the basis for initiating therapy
2. Participants will know how to monitor patients on ARV therapy and how to identify treatment success and failure
3. Participants will understand how to manage treatment failure

## Content

- Goals of HAART
- Initial strategies
- Defining ARV therapy success or failure
- Monitoring therapy
- ARV therapy in treatment-experienced patients
- Post exposure prophylaxis

## Methodology

Lecture, discussion, display of ARV drugs

## Materials Needed

- Overhead projector
- Data/Multimedia projector
- Transparencies
- Flipcharts and flipchart stand
- Markers
- Masking tape
- Laptop
- Diskettes/other media storage devices

## Activity 1: Goals of ARV Therapy

The lecturer will help participants understand the goals of HAART at all stages of` treatment

*Time: 20 minutes*

## Activity 2: Initial Strategy for ARV Administration

The lecturer will help participants understand how to combine various ARVs available in the market, the advantages and disadvantages of each combination. Participants will also understand the bases for drug choice and drug switching for patients' maximal benefit.

*Time: 30 minutes*

## Activity 3: Defining ARV Therapy Success and Failure How do you identify successful treatment?

Participants will learn the clinical and laboratory parameters with which to define ARV success or failure and the possible reasons for these observations.

*Time: 20 minutes*

## Activity 4: Monitoring Therapy

The lecture will take participants through the schedules for monitoring HAART therapy. These include the clinical, counselling and laboratory investigations required during patients' clinical visits

*Time: 20 minutes*

## Activity 5: ARV therapy in treatment-experienced patients

Participants will get to understand the indications for changing therapy in patients already receiving treatment and what alternative drug therapies exist

*Time: 20 minutes*

## Activity 6: Post-exposure prophylaxis

Although statistics show that occupational HIV-1 infection is low even when no intervention is taken, this incidence can be further reduced if immediate ARV medication is administered and continued for one month after accidental exposure to blood and/or blood products. The lecture would take participants through how to use post-exposure prophylaxis in health care settings.

*Time: 20 minutes*

## Activity 7: Group work

# Facilitator's/Lecturer's notes

## Introduction

Facilitator will introduce participants to the objectives of the module. Inform participants that at the end of each session/activity, they would be allowed to ask one or two questions to help clarify issues before the next session starts. Introduce the resource person for the session

*5 minutes*

## Activity 1: Goal of ARV therapy

The goals of therapy for HIV/AIDS are to provide the optimal and individualized treatment for individuals infected with HIV at all stages of disease. Specifically:

- Prolong life
- Reduce morbidity
- Enhance quality of life
- Reduce the transmission of HIV-1 to infants and sexual partners
- Maximally suppress plasma HIV RNA (viral load)
- Enhance immunity (increase CD4 cell count)
- Provide the most convenient HAART regimen by choosing one with a low pill burden, few food effects, and infrequent dosing schedule.
- Select a regimen with the least acute and chronic adverse effects.
- Choose the most "forgiving" regimen, one that has favourable pharmacokinetic properties and a high threshold for the development of resistance

### History of ARV therapy

- The first therapy became available in 1987 with the approval of zidovudine (AZT)
  - A reverse transcriptase inhibitor
  - A nucleoside analogue.
  - Beneficial effects were short-lived - within months the disease would again progress.
- Combination therapy
  - Use of two nucleoside analogues
  - Offered some improvement
  - The benefits were again time limited regardless of the specific combination.
- New classes of antiretroviral agents brought about sustained and clinically phenomenal results. These include:
  - The non-nucleoside reverse transcriptase inhibitors
  - Protease inhibitors
- These were used in combination with two nucleoside RT inhibitors (NRTIs).
- The use of three antiretroviral agents from two drug classes has been termed "highly active antiretroviral therapy" or HAART.
- HAART
  - HAART is associated with sustained suppression of plasma HIV-1 RNA (viral load) as measured by PCR, and significant improvement in immune status as measured by absolute and percentage CD4 cell counts.
  - These results have translated into a proven increase in survival, reduced morbidity, decreased vertical and sexual transmission, and prevention of infection following inadvertent exposure.

- Limitations of HAART
    - Not all three drugs in HAART regimens are equally effective. Those with inferior potency include triple nucleoside combinations, hard-gel saquinavir and nelfinavir-based regimens.
    - Not every HAART regimen has been tested and thoroughly compared.
    - The best overall results have been demonstrated with regimens based on the non-nucleoside reverse transcriptase inhibitors efavirenz and nevirapine or with pharmacologically enhanced protease inhibitors, such as lopinavir, atazanavir, indinavir and saquinavir.

## Activity 2: Initial strategy for ARV administration

- Proven potency
- Ease of administration
- Potential drug toxicities
- pharmacokinetics
- Resistance threshold
- Expense
- Availability

**Disadvantages of "early combination ARV therapy" in asymptomatic HIV infection**

- Resistance may develop, reducing treatment options in the future.
- Long-term, strict adherence to ARV therapy may be difficult to maintain (leading to resistance)
- In asymptomatic patients, ARV therapy may decrease quality of life because side effects are very common and taking large numbers of pills at regular intervals may interfere with employment and daily activities, and can be stressful.
- Long-term ARV therapy is very expensive
- Asymptomatic patients may be less willing to adhere to difficult ARV therapy regimens than symptomatic patients, because ARV therapy does not obviously improve their lives, and has significant side effects
- Adverse consequences of some ARV therapy such as lactic acidosis and pancreatitis may be life threatening.
- The long term side effects of ARV therapy, drug regimens remain unknown.
- The same principles of antiretroviral therapy apply to HIV-infected children and adolescents.
- The treatment of HIV-infected children, however, involves unique pharmacologic, virologic, and immunologic considerations.

## Drug combination

### Nucleoside Combinations Used in HAART

| NRTI Combination | Advantages | Disadvantages |
|---|---|---|
| Stavudine +Lamivudine (a recommended combination) | Acutely well tolerated; inexpensive; readily available | Peripheral neuropathy; pancreatitis; lactic acidosis (rare); lipoatrophy; hypertriglyceridemia. |
| Zidovudine +Lamivudine (a recommended combination) | Inexpensive; readily available. | Gastrointestinal effects; anaemia; neutropenia; lipoatrophy (less so than stavudine-based). |
| Tenofovir +Lamivudine or Emtracitabine (an alternative recommendation) | Acutely well tolerated. | Fewer long term complications; expensive; limited availability; drug interactions more likely with tenofovir (i.e. atazanavir); tenofovir must be taken with food. |
| Stavudine + Didanosine (an alternative, not recommended initially) | Effective; inexpensive | Peripheral neuropathy; pancreatitis; lactic acidosis; lipoatrophy; hypertriglyceridemia; didanosine. Must be taken without food. |
| Zidovudine +Didanosine (an alternative, not recommendation initially) | Effective; inexpensive. | Side effect profile not optimal: gastrointestinal effects; anaemia; neutropenia; peripheral neuropathy; pancreatitis; lactic acidosis; lipoatrophy. |
| Zidovudine +Stavudine (contraindicated) | None should ever be used. | Antagonistic interaction. Should never be used together. |
| Zalcitabine +Zidovudine or any other NRTI (contraindicated) | None should be used. | Low potency and peripheral neuropathy associated with zalcitabine-containing combinations. |

** Dual NRTI combinations must always be used with a third agent, preferably from another class (i.e. protease inhibitor or non-nucleoside reverse transcriptase inhibitor).*

### Triple drug regimen

The third drug of HAART is a critical choice and should be based on potency, pharmacokinetics and adverse event profile and availability

Antiretroviral Drugs Added to Dual Nucleoside Combinations in HAART

| 3rd HAART Drug | Advantages | Disadvantages |
|---|---|---|
| Nevirapine (a recommended choice) | Can be used in pregnant women; inexpensive; available. | Rash (can be severe but rarely fatal); hepatotoxicity (rarely fatal); unfavourable interaction with rifampin. |
| Efavirenz (a recommended choice) | Inexpensive; available; dosed once daily; can be used with rifampin at higher dose (800 mg daily). | Central nervous system effects common (usually self-limited); rash (usually mild-moderate); potential fetal abnormalities-can't be used in pregnancy. |
| Lopinavir/ritonavir (Kaletra®) (an alternative choice) | Potent; relatively well tolerated. | Gastrointestinal effects; hyperlipidemia; abdominal and truncal fat accumulation; expensive. |
| Indinavir with or without ritonavir (an alternative choice) | Inexpensive relative to protease inhibitors. | Without ritonavir, must be taken without food three times daily; nephrolithiasis; skin disorders; abdominal and truncal fat accumulation; glucose intolerance. |
| Atazanavir with or without ritonavir (an alternative choice) | Once daily administration; low pill burden (2); no effect on serum lipids; unique resistance profile. | Indirect hyperbilirubinemia; must be dosed with ritonavir (100 mg daily) if tenofovir coadministered. |
| Nelfinavir (an alternative choice, not recommended for first line therapy) | Relatively extensive favourable safety data available in pregnant women. | Gastrointestinal effects common; less effective than other protease inhibitors that are given with ritonavir; should not be given with ritonavir; hyperlipidemia; abdominal and truncal fat accumulation. |
| Saquinavir (an alternative choice, not recommended for first line therapy) | Less effect on lipids than other protease inhibitors. | Gastrointestinal effects (especially the soft gel formulation); poor pharmacokinetics; should be used with ritonavir and not alone; abdominal and truncal fat accumulation. |

## Activity 3: Defining ARV Therapy Success and Failure

### How do you identify successful treatment?

Successful antiretroviral therapy implies that a patient has taken his or her drugs and responded to treatment. A successful response is associated with:

- Clinical parameters
  - Typically patients describe an improved sense of well-being
  - Weight gain
  - Less fatigue
  - Decrease in oral or vaginal candidiasis
  - Fewer herpes simplex outbreaks
  - Improvement in skin and/or hair texture
  - Regression of condylomata and molluscum
  - o Regression of Kaposi's sarcoma.
- Laboratory parameters
  - Serum cholesterol levels may increase
  - Triglycerides levels may decrease
  - A rapid decline in plasma HIV RNA of at least 10 fold, or one $\log_{10}$ copies/ml within one month of therapy
  - A corresponding increase in CD4 cell count.
- Within 12 weeks of starting therapy, approximately 80% of patients will have HIV RNA <500 c/ml and CD4 count should have increased by approximately 50 cells/mm3
- The maximal effect of treatment should be observed in the majority of patients by 24 weeks. Over 95% should have plasma HIV-1 RNA below 500 or 50 copies/ml and CD4+ count increased by 50-100 cells/$mm^3$.
- There is greater variability in the change in CD4 count, especially early in treatment. Approximately 10% of patients have a disconnection of response in HIV-1 RNA and CD4 cell counts in that HIV-1 RNA declines, but the CD4 count increase is blunted. These patients may require continued prophylaxis for opportunistic infections.

### How do you identify treatment failure?

If the plasma HIV-1 RNA does not decrease steadily over the first 3 months or it rebounds to within 0.5 $\log_{10}$ copies/ml of baseline values, then the HAART regimen is failing.

Defining Success and Failure of Antiretroviral Therapy

| Defining Successful HAART | Response Defining Treatment Failure |
|---|---|
| HIV RNA decreases by >1.0 log10 Copies/ml after one month | HIV RNA does not decrease by <1.0 log10 copies/ml by one month |
| HIV RNA decreases to <500 copies/ml by week 24 and CD4 count increases by >50 cells/mm3 | HIV RNA is >500 copies/ml at week 24 |
| | HIV RNA increases to within 0.5 log10 copies/ml at any time |
| | CD4 decreases to below pre-treatment Levels |

### Causes of treatment failure

- The most common is simply not taking an effective treatment regimen by either having a suboptimal regimen prescribed in the first place or just because they did not actually take the pills as instructed.
- Continued use of antiviral drugs administered sub optimally will quickly lead to viral resistance and failure. Typical scenarios include:
  - stopping just one medication because of drug intolerance or cost concerns; losing one or more medications
  - forgetting to take doses
  - "sharing" medications with family or friends
  - selling parts of the regimen.
- Suboptimal use of drug is usually associated with treatment failure and viral resistance.

## Activity 4: Monitoring Therapy

- Prior to initiating therapy, the clinician and patient must agree on the schedule for monitoring the progress and effects of therapy.
- Following patients on antiretroviral therapy is lifelong and at a minimum at least 3-4 times annually.
- At treatment initiation or at the time of any treatment change, monitoring is more frequent.

**Suggested Monitoring Schedule for Patients Starting HAART**

| | Pre-Treatment | Week 2 | Week 4 | Week 8 | Week 12 | Every 12-16 Weeks |
|---|---|---|---|---|---|---|
| Physical Exam | X | X | X | X | X | X |
| Adherence Counselling | X | X | X | X | X | X |
| HIV RNA | X | | X | | X | X |
| CD4 cell count | X | | | | X | X |
| CBC | X | X | X | X | X | X |
| Chemistry | X | X | X | X | X | X |

- Routinely, the vital signs such as the temperature, pulse and respiratory rates as well as weight and blood pressure should be assessed.
- Every visit should be used as an opportunity for counselling clients on good nutrition, positive living, safer sex and physical exercise.
- Reports on toxicity, opportunistic infections and other drug adherence apart from ARVs should also be monitored.

## Activity 5: ARV therapy in treatment-experienced patients

- Resistance
- toxicity

### Treatment options

- **Toxicity**
  - Substitute with another drug in the same class which is less toxic

- Substitute with another drug in another class which is less toxic

➢ **Resistance**
- Change to second line drug.
- Change should be based on results of genotyping where facilities are available
- This is more difficult to do if resistant testing facilities are not available.
- The usefulness of resistance testing is in the identification of drugs that are likely to work and, independently, not to work.
- The more drugs in a regimen that is "active", the greater the likelihood that therapy
  will be successful.
- The following situations warrant resistance testing:
  - Prior to initiating therapy in a patient exposed to possibly resistant virus.
  - In patients who fail to adequately respond to therapy.
  - In patients who experience viral "rebound" or a return of HIV RNA towards baseline.

➢ Changes in antiretroviral therapy decrease future therapeutic options.

**When treatment failure occurs**

➢ Evaluate patient for reasons for failure
➢ If due to non adherence, salvage therapy is not the option

**For Nigeria**

➢ When nevirapine fails, typically efavirenz will not work either. The alternative then is to initiate a protease inhibitor-based treatment. Preferred at this junction is a ritonavir boosted regimen, lopinavir/ritonavir (Kaletra®), indinavir/ritonavir, atazanavir/ritonavir, or saquinavir/ritonavir.
➢ If lamivudine fails, the alternative is to use tenofovir plus didanosine. There is an interaction between tenofovir and didanosine which causes didanosine levels to be increased. It is recommended that didanosine dosage be reduced from 400 mg daily to 250 mg for patients weighing >60 kg. If under 60 kg, didanosine should be dosed at 125 mg daily.
➢ If these alternatives fail then switch to new class of drug such as an entry inhibitor like enfuvirtide, the anti-fusion drug. It is very expensive with limited availability.
➢ If all treatment fails, then manage patient using prophylaxis for opportunistic infections and give palliative care.
➢ Changes in antiretroviral therapy can decrease future therapeutic options, however when the changes are made early, before there is multiple drug resistance, it is possible to spare a class for future use.
➢ The same principles of antiretroviral therapy apply to HIV-infected children and adolescents.
➢ The treatment of HIV-infected children, however, involves unique pharmacologic, virologic, and immunologic considerations.

## Activity 6: Post-exposure prophylaxis

➢ At the present time, following a significant exposure, three drug combinations should be provided to the healthcare worker for four weeks.

- Prior to the administration of the drugs, the healthcare worker and index patient should be tested for HIV. In the event that a patient is already known to be positive for HIV, this can be deferred.
    - A complete blood count and chemistry should be done after 2 weeks.
    - Testing for HIV should be done at 12 and 24 weeks.
    - If negative at 24 weeks, the healthcare worker can be considered to be uninfected.
- The use of nevirapine in post-exposure prophylaxis carries significant risk in HIV-negative immunocompetent individuals. Adverse events associated with nevirapine include
    - life-threatening rash
    - hepatic failure.
- If possible, an alternative drug should be substituted, such as efavirenz. Efavirenz cannot be used in patients who are pregnant or who are contemplating pregnancy. Alternatives include any protease inhibitor-based three drug regimen and even triple nucleoside regimens, such as zidovudine/lamivudine/abacavir (Trizivir®), if the index patient is thought not to have resistance to any of the drugs, s(he) was taking, particularly lamivudine.
- There is increasing indications of the effectiveness of post exposure prophylaxis following unprotected intercourse though many studies are yet inconclusive. However, if clinically appropriate, the same regimen as above should be employed. This approach is taken in cases of rape by suspected HIV infected persons in many areas of the world.

## Activity 7: Group work

Participants would be given opportunity to observe some HIV diagnostic laboratory procedures.

# Module 8
# Theme: Adherence to Antiretroviral Therapy

## Goal
To ensure participants understand the importance of drug adherence with respect to ARV drug management

## Objectives
1. Understand the importance of Adherence in ARV therapy
2. Acquire necessary knowledge and skill to ensure adherence to ARV therapy

## Content
- Overview of Adherence
- Goals of Adherence
- Factors influencing Adherence
- Strategies to enhance Adherence
- Adherence counselling
- Support for adherence

## Methodology
- Lecture
- Discussion
- Demonstration and
- Role play

## Materials required
- Overhead projector
- Data/Multimedia projector
- Transparencies
- Flipcharts and flipchart stand
- Markers
- Masking tape
- Laptop

- Diskettes/Other media storage devices

## Activity 1: Overview of adherence

Participants would understand what Adherence means and the difference between Adherence and compliance. .

*Time: 10 minutes*

## Activity 2: Goals of adherence

The lecturer would define the goals of ARV drug Adherence for HIV management and the need for strong Adherence to drug therapy

*Time: 20 minutes*

## Activity 3: Factors influencing adherence

The various factors influencing the possible success of clients adhering to drug regimen would be discussed

*Time: 20 minutes*

## Activity 4: Strategies to enhance adherence.

The session would focus on how the ARV management team can enhance client's ability to adhere to drug regimen. The lecturer would discuss the factors that can enhance

*Time: 30 minutes*

## Activity 5: Adherence counselling

Counselling has a role to play in ensuring client's successfully adhere to their drug regimen. The session would focus on how to counsel client's on drug use and possible ways to help ensure drug adherence and compliance with regimen

*Time: 20 minutes*

## Activity 6: Support for adherence

This session would help participants to identify essential support services needed to enhance ARV Adherence by clients

*Time: 10 minutes*

## Activity 7: Group work

# Lecturer/Facilitator's notes

## Introduction

The facilitator will introduce participants to the objectives of the module. S(He) would also highlight the importance of the session. The two main thrust of ARV drug administration is for the health management team to understand the principles of drug administration and for clients to comply with drug regimen. This session would help nurses to have an overview of the importance of ARV drug Adherence as well as identify their roles in ensuring clients' compliance and Adherence with drug regimen. The resource person will then be introduced

*5 minutes*

## Activity 1: Overview of Adherence

- Adherence can be defined as the extent to which a client's behaviour coincides with the prescribed health care regimen as agreed upon through a shared decision making process between the client and the health care provider.
- The term "compliance" is defined as acting in accordance to a command. In healthcare it is often perceived as obeying a provider's instructions while adherence is perceived as a patient agreeing to make behaviour changes that improves his or her health.
- General observations about adherence have been acquired from studies in the disease areas of diabetes, coronary heart disease, TB, and in the geriatric population
- Adherence to drug regimes is poor across all populations and diseases
- The proportion of patients who fail to self-administer medication as prescribed can range from 20% to 100%. The average is 50%.
- Clinicians consistently overestimate the percentage of patients who will adhere and generally are unable to predict who will adhere or not adhere to recommended drug regimen.
- Everyone has trouble taking medication in every disease.
- Non-adherence accounts for a significant % of admissions in patients being treated for heart disease.
- Directly Observed Therapy (DOT) has been used in other diseases (e.g. Tuberculosis) to improve adherence.
- More frequent dosing lower Adherence. Increased number of pills may have same effect.
- Adherence is difficult over the short and long term

## Activity 2: Goals of Adherence

- The accepted definition of successful adherence for most other chronic diseases is >80% of pills taken. This standard does not apply to HIV disease and antiretroviral therapy. With HIV therapy, greater than 95% is the goal
- Less than excellent adherence may result in virus breakthrough and emergence of drug resistant strain of HIV. Even short-term non-adherence to an aggressive therapy may result in rapid virus re-population in lymph nodes.
- Taking less than between 60 and 90% is associated with development of resistance i.e., taking some medication is worse than taking none in the long run
- Reasons for missing doses change over time (initiation period versus maintenance)

- Adherence in most patients will decrease over time as new problems and side effects arise and pill fatigue sets in.
- High levels of Adherence are critical to prevent resistance and improve health
- Adherence is hard to predict
- Factors that impact Adherence must be identified and addressed
- Certain factors are likely to be universal (dosing frequency, knowledge, side effects) while others will be specific to the population or individual

## Activity 3: Factors influencing Adherence

**Factors related to the drug regimen:**

- Cost of the regimen
- Complexity of the regimen
- Storage of drugs, e.g. refrigeration
- Duration of the therapy
- Extent to which the regimen interferes with the patient's daily life
- Model of regimen delivery
- Side effects associated with the regimen

**Factors related to the patient and/or the provider:**

- Provider not familiar with antiretroviral therapy, side effects, drug-drug interactions, etc.
- Lack of understanding on part of patient/provider of relationship between Adherence and resistance
- Poor communication between provider and patient
- Lack of trust between patient and provider/health care system
- Lack of self-efficacy (belief in self and therapy)

**Psycho-social issues:**

- Depression or stress related to living with HIV (stigma or discrimination)
- Fear of disclosure
- Active alcohol or drug use
- Lack of support from family, friends, community
- Unstable living environment, lack of food or shelter, other basic needs
- Cultural beliefs and practices regarding disease and treatment

**Reasons for missed doses:**

- 36% did not understand their regimen (women with children are less likely to understand)
- 43% just forgot
- 36% slept through dose
- 32% travel
- 27% changed daily routine
- 11% felt sick
- 9% depression

## Activity 4: Strategies to enhance Adherence

**Reasons for poor adherence to drug therapy:**

- Multiple drugs to be administered
- Pill burden may be high

- Frequent dosing
- The regimen may be complicated
- Toxicities are common
- Drug interactions may occur
- There are often food restrictions
- Medications are expensive
- There is an enormous social and psychological burden for many patients
- Therapy is life-long.

**Need to improve adherence:**

- Reason:
  - Less than 95% adherence to a regimen can lead to viral resistance and ultimately treatment failure.
  - For every 10% decrease in adherence, there is a corresponding 16% increase in mortality.

**Factors that make Adherence successful**

- To succeed, a patient must have access to, take and tolerate ARV Therapy
- To prepare for ARV Therapy and Adherence, all potential barriers should be identified and begun to be addressed
- Reassessment for new barriers should occur at every visit. Many of these barriers will impact Adherence and could ultimately result in therapy failure
- For patients who need therapy and are able to access the medications, the question is not whether to start therapy, but when and how to start therapy. This must be a mutual decision

**Strategies to improve Adherence**

- Reasons for poor Adherence are multifaceted; therefore, a combination of interventions must be considered
- Strategies that enhance Adherence must be tailored to individualized needs
- Regimen related strategies
  - Cost of Regimen
  - Prior to initiating ARV therapy, explore with the patient his/her ability to financially secure medication for both the short and long term…develop a plan!
  - Insure medication availability
  - Adherence often decreases over time due to “pill fatigue”. Assess Adherence at every visit/interaction with the patient in a non-judgmental manner
  - The more complex the regimen, the poorer the Adherence. Make every effort to simplify the regimen in terms of number of pills and dosing frequency. If possible, minimize dietary (food and water) requirements and minimize drug - drug interaction
  - Tailor regimen to individual lifestyle. Adherence is enhanced if the regimen fits into a person’s daily routine
  - Discuss detailed daily schedule with patient
  - Assist patient to coincide doses with daily routine
  - Assist patient to look for “cues” (daily activities) that fit medication intervals
  - Provide timed reminders (inexpensive beepers, watches, labeled pill boxes)
  - Assist patient to plan ahead for changes in routine (e.g. travel, weekends, holidays)
  - Directly Observed Therapy was pioneered to improve Adherence to anti-tuberculosis treatments. Like HIV therapy, TB treatment requires multiple drugs, and non-adherence can lead to resistance development. High rates of non-adherence led to

the development and transmission of drug resistant TB strains. DOT was implemented and found to achieve improved Adherence in setting of tuberculosis. Much interest in this model for HAART delivery due to high rates of co-infection and the success of DOT for TB programs. Unlike TB treatments however, HAART must be given life-long, may have increased and more severe adverse effects, and may have a greater degree of stigma attached.

- **Side effects**
  - Side effects of ARV are a major barrier to Adherence. All medications have side effects ranging from minor to life threatening. Side effects are the most common patient reported cause for protease inhibitor discontinuation. Impact of side effects varies from minor but impacting quality of life to life threatening .Over time side effects change (early mostly GI, later metabolic complications including lipodystrophy)
  - Discussion and balancing of risk and benefit is critical to prepare for side effects and toxicities
  - Aggressive education, intervention, and support may decrease side effects and increase Adherence
  - Use multiple routes to teach (community/clinic educators, support groups, written and oral information)
  - Inform patient, anticipate, and treat side effects: prepare patients for side effect and preempt problems
  - Educate clinic staff on management and palliation of side effects and recognition and which mandate discontinuation of ARV therapy and which will decrease with treatment (e.g. Nelfinavir and diarrhoea) or decrease with time (e.g. AZT and nausea)
  - Adherence is a learned skill. Before a patient can comply with their regimen, they must fully understand it. Give information on the basics of HIV Infection, purpose of antiretroviral therapy, all the names of each medication, reasons for dose and administration requirements; connection between adherence and resistance; potential side effects and treatments
  - Provide culturally, linguistically and literacy appropriate materials, both written and pictorial
  - Education must be ongoing, repetitive, and revised to address the changing needs of patient
  - Enhance Self-Efficacy. The patient who understands the therapy regimen, understands the relationship between adherence and resistance, believes in the effectiveness of the medication, believes in his/her ability to take the medications as prescribed, has trust in health care provider has a better chance of success.

**Some critical points for patient education**

- Some drug is NOT better than no drug
- Do not share medications
- Continue taking medications even when feeling “well”
- Do not stop medications due to side effects without consulting your provider
- The medications do not cure HIV
- The medications do not keep HIV from spreading through sex and other routes
- Remember to use protective measures all the time

**Rewards for successful adherence**

- Positive feedback- decreased viral load, increased CD4 cells
- Verbal support/encouragement from provider
- Use of incentives, e.g. food ,transportation vouchers
- Social support - If possible, involve and educate family/friends to provide support for adherence
- Community based support groups
- Peer support!!

**Provider related strategies**

- Provider education
- Therapeutic relationship
- Tailor strategies to the individual
- Acknowledge successes
- Social support
- Provider should have up to date knowledge of HIV disease and therapy regimens; knowledge regarding the management of potential side effects; understanding the relationship between adherence and viral resistance; understand factors associated with adherence and non-adherence:
- Establishing patient readiness before first prescription
- Skills in patient education
- Therapeutic relationship:
    - Establishment of a trust
    - A strong provider-patient relationship can be a very powerful tool that can greatly affect adherence
    - Reduction of stigma by non-judgmental attitudes
    - Respect client privacy and confidentiality!!
    - Availability for follow-up and support
    - Positive attitude regarding therapy by client and patient
    - Collaborate with client in goal setting and adherence goals
    - Work to develop open and honest communication
    - Encourage involvement of family, friends and peers for support
    - Pro-active management of adverse side effects
- Tailor interventions:
    - Each patient will present their own individual issues related to their ability to adhere
    - Listen, recognize and address concerns
    - Consider traditional and cultural beliefs
    - Help patient take medications as prescribed
    - Acknowledge successes. Positive feedback when achieving clinical/virologic benefit
    - Prepare for Failures. Be supportive and understanding. Aggressively work with the patient to make effective adjustments
- Support
    - A multidisciplinary approach to support for patients is essential
    - Use health care team approach
    - Seek support from NGOs
    - Refer to peer support groups
    - The health care provider shares the responsibility for successful adherence
- Psychosocial Issues

- Once in care and eligible for therapy, multiple psychosocial and concrete barriers to adherence may remain
- A holistic and multi-disciplinary approach to address these issues is essential
- Treatment of co-existing behavioural or psycho-social issues is crucial
- Patients who are isolated without the support of family, loved ones, or friends are less likely to be adherent. Explore with the patient if family or friends could provide support.
- Assist in the education of family members or friends regarding HIV and ARV Therapy
- Explore with the patient the option of one to one peer (buddy) support
- Refer to peer support groups where available
- Consider initiating support group.
- Before a patient can consistently adhere to ARV therapy, their most pressing basic needs must be addressed. Access to food and stable shelter must be assessed.
- A patient's safety must be assessed.
- Need for childcare and transportation to seek care.
- Refer to NGOs or government programs.
- Nurses and social workers, home-based care volunteers, and other community based counselors can work together to ensure continuity of care and support.
- On-going evaluation of needs.
- The ethno-cultural beliefs and practices of the patient must be incorporated into the therapy plan.
- Explore the relationship between the patient and the traditional healer.
- Assess cultural beliefs and practices regarding disease and therapy.
- Incongruence should be addressed, e.g. sharing medications
- Efforts should be made to ensure collaboration between traditional healers and modern medical care providers to enhance adherence.
- Mental health counselling should be considered for addressing depression or stress of living with HIV.
- Denial of status will result in non-acceptance of therapy or decreased adherence
- "Readiness" is not only clinical status, but also psychological acceptance of disease and need to take therapy.
- Stigma and fear of discrimination may interfere with patient taking medications as prescribed or seeking care.

**Improving Adherence**

- Do not rush to treat – assess carefully
- Start with twice or once daily regimens
- Lower pill burden
- Pay attention to minor side effects, these might be important
- Consider on site dispensing
- Encourage patient diaries
- Intensify counselling and patient education
- Improve patient – care provider interaction
- Consider DOT (early in therapy, selected population)
- Explore possibility of family and community support

**Key Points**

- Multiple potential barriers even before ARV therapy is started will impact Adherence and will need to be addressed.
- These challenges include psychosocial (readiness, knowledge, fear), concrete/structural (reliable access to therapy and care, competing social issues), and medication demands (dosing, side effects).
- Education and linkage into resources, combined with support and strong provider-patient relationship, can decrease the impact and improve adherence.
- Education plays a critical role for both patients and (all) providers.
- Role of multidisciplinary team with linkages to other HIV service and support organizations can decrease the clinic burden and increase resources needed to overcome barriers.
- As adherence can decrease over time and new challenges arise, Adherence assessment and support must continue at every encounter.
- The response and support of all care providers and community is critical for success.
- The development of care system which incorporates these interventions is crucial.

## Activity 5: Adherence counselling

It is important to note the following for successful counselling

- Do not rush to treat…assess "readiness" carefully.
- Counselors must help in ensuring that their patients have the knowledge and skills needed to meet the challenge of adherence to ARV therapy.
- Success requires a strong provider-patient relationship, based on a mutual respect, trust and openness.
- Patient must feel confident that their confidentiality will be respected.
- Two-way collaborative relationship, provider as guide, both invested in the outcome.
- Providers belief about the efficacy of ARV Therapy and the importance of Adherence significantly impacts a patient's ability to adhere.
- The counselor must understand the pathophysiology of HIV and the basics of ARV therapy, importance of adherence and factors that influence adherence.
- Attitudes, feelings, prejudices towards PLWHA should be clarified and addressed (values clarification).
- Broader context of the lives of their patients (poverty, lack of food, shelter) needs to be well understood.
- Need for an empathetic, non-judgmental approach in counselling
- The counselors must understand and continue to understand:
    - There is no such thing as a single session approach…counselling must be ongoing.
    - Need to be flexible and open to new strategies.
    - Cultural beliefs on illness and health, impact Adherence.
- Need for interventions to include cultural values, customs, and traditions.
- Need for their patients to identify their barriers to adherence and be involved in the development of strategies
- A multi-disciplinary team collaboration is needed to meet the needs of the patient
- Integrate clinical care and counselling support
- Research shows that social support and peer support is effective and important
- Explore with patient the possibility of involving family for support
- Be aware of referral sources: NGOs, community based organizations, peer support groups

## Activity 6: Support for Adherence

- Patients on treatment should receive support to facilitate their adherence to the prescribed treatment. This can be facilitated by:
  - Community based volunteers and family members who are enlisted to assist in patient support.
  - Each patient has a support person assigned.
  - Support persons are trained to assist the patient with his/her drug regimen.
  - Whenever possible, the support person accompanies the patient to the appointment with the caregiver and reports on progress as well as on barriers encountered.
- Patients on treatment could be referred to organizations or individuals who can help address their social needs. Such organizations should:
  - have a policy to support patients with their social needs.
  - have a mechanism and operating procedure to assist patients with their social needs.
  - have an effective referral mechanism to other organizations or individuals in place to support social needs of patients.

## Activity 7: Group work

Participants would visit an HIV treatment clinic and practically participate in drug Adherence session.

# Module 9

# Theme: Comprehensive Care and Support for PLWHA

## Goal

To strengthen the capacity of participants in the provision of comprehensive care, and support to PLWHA.

## Objectives

1. Identify the purpose of HIV/AIDS care
2. Discuss the care of PLWHA and HIV related diseases using the nursing process.
3. Understand the importance of establishing quality care
4. Understand the importance of community/home based care of PLWHA to enable family members become self reliant and confident in providing care.

## Content

- Objective of HIV/AIDS care treatment and support
- Components of comprehensive care
- Continuum of care
- Nursing care of PLWHA as a chronic disease using the nursing Process
- Quality Assurance in the management of HIV/AIDS patients
- Community/Home based care

## Methodology

- Lecture/Discussion
- Demonstration
- Sharing experience with PLWHA
- Role play
- Visit to the care and support centres

## Material needed

- Overhead projector
- Data/Multi-media projector
- Transparencies
- Flip-chart & flip-chart stand
- Markers (coloured)
- Masking tape
- Lap top
- Diskettes/other media storage devices

## Activity 1: The objectives of HIV/AIDS care, treatment and support programmes

Participants will be introduced to the purpose of HIV/AIDS care, treatment and support programme. The emphasis of the programme is on improving the health of persons infected with HIV and AIDS and to ensure qualitative life with the commencement of antiretroviral therapy

*Time: 20 minutes*

## Activity 2: Components of comprehensive care, treatment and support programmes

Participants will be able to identify the various care and support programmes needed by PLWHA which would all together enhance access to and compliance to ARV use. It would also discuss how these services could be provided in an integrated fashion

*Time: 30 minutes*

## Activity 3: Continuum of care

The session will focus on facilitating participants' understanding on the need to link care and support services, so as to ensure that care of PLWHA is provided as a continuum. Participants would appreciate how care for PLWHA facilitates prevention of HIV infection and the importance of instituting referral services in care institutions

*Time: 30 minutes*

## Activity 4 Defining standard of care in HIV/AIDS management

The resource person will highlight the importance and role of defining the standard of care in any service institution, the place and the importance of this in HIV/AIDS management

*Time: 30 minutes*

## Activity 5: Home based care

This interactive session will discuss the organization of home based care for HIV/AIDS management, its role in enhancing ARV drug compliance and the role of community nursing care of signs and symptoms of PLWHA at home.

*Time: 40 minutes*

## Activity 6: Care of children orphaned by AIDS

During this session, the peculiar needs of children orphaned by HIV/AIDS will be highlighted, and how the needs can be addressed.

*Time: 30 minutes*

## Activity 7: Group work

# Lecturer/Facilitator's notes

## Introduction

The facilitator should introduce the objective of the module. S(He) should give a little insight into comprehensive care of patients, and the need to understand the role of this care in the management of persons with HIV/AIDS. Participants will be allowed to ask questions after each session so as to clarify issues, before going on to another session. The resource person is then introduced.

*Time: 5 minutes*

## Activity 1: The objectives of HIV/AIDS care, treatment and support programmes

- to assure equitable access to diagnosis, medical care, nursing care and support services
- to reduce morbidity and mortality in HIV/AIDS
- to promote prevention of opportunistic infections in patients with HIV/AIDS
- to improve the quality of life in people living with HIV/AIDS

## Activity 2: Components of comprehensive care, treatment and support programmes

Comprehensive care commences before diagnosis, through to diagnosis, to the implementation of therapeutic activities.

The components are:

- Medical and nursing care :
  - Management of HIV related opportunistic infections
  - Prophylaxis for opportunistic infection
  - TB control/management
  - STI management
  - Access to HIV related drugs
  - Counselling and testing
  - Interventions to reduce mother to child transmission
  - Care for mothers and infants
  - Nutritional support
  - Health education
  - Palliative care
- Psychological support:
  - provision of pre, post and ongoing counselling
  - community services to meet emotional and spiritual needs
  - support services for families and communities
  - support group for persons living with HIV/AIDS
- Socio-economic support
  - provision of services to reduce financial burden of infection to ensure good nutrition and meeting daily needs

- organisation of micro-credit schemes
- support for orphans and vulnerable children

➢ Involvement of persons infected and affected by HIV/AIDS in service planning and delivery
- this helps to ensure that care and support programmes are properly designed to meet the specific needs of persons infected and affected by HIV/AIDS
- helps to reduce self stigma as this process helps with the empowerment of persons living with HIV/AIDS
- human right issues are addressed at the process of programme design

➢ Legal services:
- Address abuses of human rights of persons infected and affected by HIV/AIDS including discrimination in health care services, discriminatory workplace policies, education and housing policies

➢ Adequate comprehensive care can only be provided in an environment that has supportive policies free of stigma and discrimination of persons living with HIV/AIDS

*Present the diagram on comprehensive care to help participants understand the concepts of comprehensive care and support*

## Activity 3: Continuum of care

➢ The concept of care provided as a continuum ensures that all the service needs of persons infected by HIV/AIDS are provided from a focal point through the use of appropriate referral systems

➢ It means providing a range of needs that support and maintain the health of an individual over a period of time (*Present the diagram on continuum of care to help participants understand the concepts)*

### Care and support involving the 3 tiers of health care system

| Level of care | Where it is available | Approaches to care |
|---|---|---|
| *Primary* | ▪ *Health post*<br>▪ *Basic health centres*<br>▪ *Home base care*<br>▪ *Traditional centers* | ▪ *Primary care (treatment of minor ailment)*<br>▪ *Counselling services*<br>▪ *Promote preventive medicines* |
| *Secondary* | ▪ *Comprehensive health centers*<br>▪ *State hospitals* | ▪ *Screening and diagnosis*<br>▪ *Counselling*<br>▪ *Treatment of opportunistic infection* |
| *Tertiary* | ▪ *Teaching hospitals*<br>▪ *Specialist hospitals* | *The same as secondary but deals with more specialized conditions* |
| *Others-NGO/CBO* | ▪ *Short stay care centers*<br>▪ *Home based care*<br>▪ *Support group centers* | *Provide support, care and treatment of common symptoms and minor ailments.* |

*Culled from NELA's manual on home based care and counselling training manual*

## Activity 4: Defining standard of care in HIV/AIDS management

- The purposes of setting standard of care are to:
  - promote delivery of the highest possible quality of care
  - establish measures for evaluating and improving client services
- This requires:
  - deciding how to achieve standards
  - applying them in clinical practice
  - evaluating to see if they have been achieved
- At each level of the health care system, different standards would be applied for an essential comprehensive care package
- Both the development of practice standards and quality assurance to monitor the implementation of these standards are important to delivering appropriate HIV care
- Nursing services should be based on affordable and standardized practices using national and international guidelines based on use nursing process approach.
  - Preventive therapies
  - Management of HIV-related conditions and opportunistic infections
  - Secure supply of prescribed medications
  - Highly active antiretroviral therapy (HAART)
  - Post-exposure prophylaxis for occupational injuries
  - STI management
  - Palliative care
- To ensure that the needed standard of care for HIV patients and their management is maintained, each institution needs to monitor its activities. This entails:
  - To check on progress and challenges.
  - To make sure that what we are supposed to do is done well.
  - To help with day to day case management.
  - To help with record keeping of patient's progress.
  - To learn more about patients' needs and respond better to these needs.
  - To report on progress and challenges to authorities.
  - To share experiences and lessons learnt with others.
  - To avoid duplication of work and effort.
  - To change what is not working.
  - To feed into evaluation process.
  - To help plan for the future.

## Activity 5: Home based care

### What is home based care for PLWHA and why home based care?

- Home based care is any form of care given to those affected and infected by HIV in their own homes.
- It is a form of care given for chronic disease conditions, which enables patients spend as much time as possible out of the clinical setting
- It would include things that individuals do to take care of themselves and care given to them by family, or health care provider in their home
- It is the range of care spanning from physical, to psychosocial, spiritual care and support

- It is holistic in nature
- It is an inevitable element of comprehensive care for PLWHA especially when counselling has reached the extent of co-opting family, community and significant others in the care.

## The goals of home base care are to:

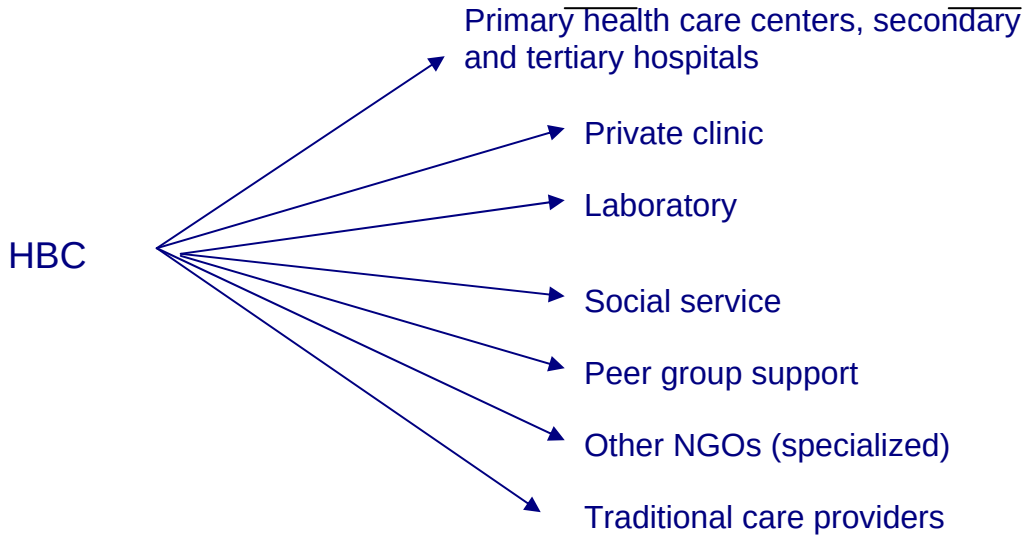
- Improve the quality of life for PLWHA, and to provide quality clients care.
- Reduce the stigma experienced by PLWHA and members of their family in public health institution.
- Reduce the expenditures and economic impact of HIV on the family
- Strengthen care givers capacity in aspect of prevention, care, counselling community mobilization and support.
- Provide health care providers with the information they need to help families gain confidence about the ability to care.

## Why home based care?

It is important to appreciate the reasons why home care is appropriate. This includes:

- The home is the primary source of care for the members of the family
- The extended family is still strong in many places and is willing to provide care once the condition of the patient is explained
- Hospital care is not readily accessible for many people (cost and otherwise)
- Hospital care is not always desirable for people with chronic and terminal illness owing to overcrowding and understaffing which results in poor standards of care
- Home based care provides health workers access to the immediate family and community, allowing opportunity for education as well as support. This leads to acceptance of the disease and helps promote prevention.

HBC is linked to other forms of services PLWHA can access. This is so as to ensure a network of service provision for PLWHA that can be facilitated by carers, thereby assuring PLWHA comprehensive care. *After which the facilitator presents the diagram below and explains the feasibility of ensuring a referral system linking HBC to other essential facilities for the PLWHA.*



## Benefits of home based care for PLWHA

- Cheaper for the client
- Brings help closer to the client and strengthen family bonds
- Encourages family education about HIV/AIDS
- Reduces the stress on carers
- Allows for alternative support for the client
- It can help compliment the efforts of clients' clinical management during ARV therapy?
    - Adherence of patients to drug therapy can be increased
    - Prompt management of opportunistic infections can be effected
    - Care-givers can assess social constraints limiting patients' clinical management
- How can clinical management of patients be linked with home-based care services?
    - The hospital can establish home base care services that can provide care to patients diagnosed with HIV infection
    - The hospital can link up with organizations that provide home-based care services and refer all patients to that service for effective monitoring
    - The hospital can work with volunteers who can make regular home visits and monitor the patients that are identified by the organizations.

## Setbacks of home based care for PLWHA

- Ignorance of the disease
- Fear of stigmatization/discrimination
- Problem of shared confidentiality
- Economic constraints
- Problem of dependency on care provider
- Problem of safety precautions.
- Stressful for carers.

## Community care of signs and symptoms of PLWHA at home

- Participants are to brainstorm on symptoms of HIV/AIDS that are known to them and appropriate drugs used.
- Encourage appropriate referral in the management of the symptoms identified.
- Encourage deliberations and inputs from participants

*Present the table below on transparencies for participants review*

## Drugs Treatment in HIV/AIDS

| Common ailments | Drug management |
|---|---|
| Pain | Painkillers such as ibuprofen, aspirin or paracetamol, indocid. Remember that NSAIDs should not be taken on empty stomach |
| Mouth thrush | Gentian violet solution, nystatin oral, ketoconazole suspension, vitamin C |
| Diarrhoea | ORS, lomotil, thalazole, imodium capsules, flagyl and septrin |
| Coughing | Cough expectorant/cough mixture |
| Skin problems: rashes<br><br>Scabies | Calamine lotion, Antihistamine<br><br>Benzyl benzoate |
| Nausea and vomiting | Phenergan (avomine) |
| Loss of appetite/loss of weight | Multivitamins, folic acid. |
| Fever | Chloroquine, aspirin |
| Tuberculosis | Streptomycin, isoniazide, ethambutol, thiacetazone, rifampicin, pyrazinamide.<br><br>Note: that these drugs can only be given when prescribed by a trained doctor. Drug interactions and reactions could also occur so care is needed with their use |
| Mental confusion and dementia | Refer to the hospital |

Medicines to be used with caution in people with HIV/AIDS include thiazetazone, sulphonamides and steroids.

## Principles guiding the use of drugs at home

- Checklist /chart for dispensing drugs
- List the information required by the client
- Make sure the client can afford the drug you are prescribing
- Help client to understand how to use the drug
- Double-check your treatment dosage, name and duration
- Try to help the patient to calculate how much it will cost
- Advise on proper storage of drugs
- Label drugs clearly
- Check the remaining drug at home before prescribing new ones. Only keep and use a small number of drugs at home
- If not clear about the drugs at home - check or take away

## Rational usage of drug

Before a drug is used at home, the following must be put into consideration:

- The necessity of the drug
- Is it the correct drug for the condition
- Any contraindication (for example for pregnant woman and child)
- Is the client taking any drug that might interfere with the drug
- Is it affordable and available to the client
- Assess the side effects in relation to the condition of the client

*Adapted from NELA's manual on home based care and counselling training manual*

## Activity 7: Group work

Exhibition of drugs
Group presentation of hypothetical cases
Role play

# Module 10
# Theme: Opportunistic Infections

## Goal
To provide participants with knowledge of common opportunistic infections associated with HIV/AIDS.

## Objectives
1. Recognize various types of opportunistic infections associated with HIV infection
2. Discuss the appropriate management strategies for these opportunistic infections.
3. Determine the nursing management of these opportunistic infections.

## Content
- Common bacteria infections associated with HIV/AIDS
- Tuberculosis and HIV infection
- Common viral infections associated with HIV/AIDS
- Common fungal infections associated with HIV/AIDS
- Common protozoal infections associated with HIV/AIDS
- Malaria and HIV infection
- Malignancies and HIV infection
- Specimen handling
- Clinical presentation of opportunistic infections
- Nursing care management

## Methodology
- Lecture
- Discussion
- Pictorial

## Material needed
- Overhead projector
- Data/Multi-media projector
- Transparencies
- Flip-chart & flip-chart stand
- Markers (coloured)
- Masking tape
- Lap top
- Diskettes/other media storage devices

## Activity 1: Introduction

During this session, participants will be acquainted with various types of opportunistic infections associated with HIV infection and their management.

*Time: 20 minutes*

## Activity 2: Common Bacterial Infections associated with HIV/AIDS

Participants will be able to highlight common bacteria infections associated with HIV-1 infection. The clinical signs and symptoms of these infections will be identified as well as laboratory investigations and their managements.

*Time: 35 minutes*

## Activity 3: Tuberculosis and HIV infection

Tuberculosis constitutes a major opportunistic infection in HIV infection. There are associated challenges with managing tuberculosis co-infection with HIV/AIDS. Participants would learn about this management challenges and how to effectively address them.

*Time: 30 minutes*

## Activity 4: Common Viral Infections associated with HIV/AIDS

Participants will be able to highlight common viral infections associated with HIV-1 infection. The clinical signs and symptoms of these infections will be identified as well as laboratory investigations and their managements.

*Time: 25 minutes*

## Activity 5: Common Fungal Infections associated with HIV/AIDS

Participants will be able to highlight common fungal infections associated with HIV-1 infection. The clinical signs and symptoms of these infections will be identified as well as laboratory investigations and their managements.

*Time: 35 minutes*

## Activity 6: Common Protozoal/Parasitic Infections associated with HIV/AIDS

Participants will be able to highlight common protozoal infections associated with HIV-1 infection. The clinical signs and symptoms of these infections will be identified as well as laboratory investigations and their managements.

*Time: 35 minutes*

## Activity 7: Malaria and HIV infection

During the course of this lecture, participants will be able to highlight research findings on HIV and Malaria co-infection. They will also highlight the implication of the research findings on the severity of Malaria, HIV infection and drug management.

*Time: 20 minutes*

## Activity 8: Malignancies in HIV infection

Participants will be able to highlight common malignancies associated with HIV-1 infection. The clinical signs and symptoms of these infections will be identified as well as laboratory investigations and their managements.

*Time: 20 minutes*

## Activity 9: Specimen Handling

During this session, participants will be exposed to handling of specimens for laboratory diagnosis. Emphasis would be placed on observance of universal precautions

*Time: 15 minutes*

## Activity 10: Overview of clinical and laboratory presentation of opportunistic infections

Participants will understand the pathogenesis and pathophysiology of the multiple occurrence of opportunistic infection in HIV infection. The session would also highlight how these varied clinical manifestations are related to laboratory parameters.

*Time: 20 minutes*

## Activity 11: Nursing management strategies for opportunistic infections in adults and children

This activity will focus on identifying various nursing management strategies for common opportunistic infections seen in children and adults

*Time: 20 minutes*

## Activity 12: Group work

Presentations using hypothetical case

# Lecturer/Facilitator's notes

## Introduction

The resource person should introduce the objectives of the module. Give a little insight into what participants should expect from the session. Participants would be allowed to ask questions at the end of the session so as to clarify issues. The resource person is then introduced

*Time: 5 minutes*

## Activity 1: Introduction

- Opportunistic infections are diseases occurring in an immuno-suppressed individual caused by an organism which is non-pathogenic or weakly-pathogenic in individuals with a normal host defense (e.g. PCP). May also be a more severe form of disease than that normally seen in a normal host (e.g. TB, coccidiomycosis)
- Risk for an opportunistic infection, AIDS-related malignancy or other HIV-related complication of HIV depends on:
  - Strength of immune system (measured by CD4 counts)
  - Risk of exposure (e.g. TB, Kaposi's sarcoma)
  - Use of prophylaxis
- Certain complications are defined as AIDS defining, and reflect more advanced disease as measured by CD4 cell counts and survival (WHO clinical stage 4).
- At higher CD4 counts, many complications overlap with conditions found in general population (bacterial pneumonia, pulmonary TB), although they may be more frequent or more severe (WHO stages 2 and 3)
- As CD4 cell counts decline, the spectrum of conditions broadens and include HIV-specific and opportunistic infections.
- The risk of complications seen earlier in disease may increase as well as new HIV-related complications occurring.
- Further increases in risk are also seen for some OIs with increases in plasma HIV viral load.
- The use of effective ARV drug combinations reduces the occurrence of OIs in HIV infected individuals.
- Level of immune compromise as reflected by CD4 cell count helps predict the spectrum of AIDS-related complications to which an individual is susceptible.
- This information is critical in determining need for prophylaxis and the differential diagnosis of symptomatic patients.
- Successful use of HAART results in restoration of some part of the immune system, and risk of some OIs decrease.
- Within three to nine months of effective ART (as determined by recovering CD4 cell count and lowered viral load), risk of many OIs decline significantly.
- During immune reconstitution, worsening of pre-existing OIs and other AIDS-related conditions may occur.
- This declining risk has led to discontinuation of prophylaxis in selected groups of patients responding to HAART.
- Should OI prophylaxis in the setting of CD4 recovery be stopped?
  - Risk
    - OIs decrease survival and increase viral load (VL)
    - OI-related morbidity
    - Unknown duration of HAART-related benefit

- Discontinuation of bactrim may increase risk of bacterial infections.

- Benefit
  - Fewer pills
  - Improve adherence
  - Decrease cost
  - Decrease risk of drug resistance

### When to discontinue prophylaxis

| Opportunistic infection | Safe | When? |
|---|---|---|
| *Pneumocystis carinii* pneumonia | CD4>200 cells/µl | Yes |
| *Mycobacterium avium* complex | CD4>100 cells/µl | Yes |
| Cytomegalovirus | CD4>100 cells/µl | Yes |
| *Toxoplasma gondii* | CD4>200 cells/µl | Yes |
| *Pneumocystis carinii* pneumonia 2° prophylaxis | CD4>200 cells/µl | Yes |
| Toxoplasmosis maintenance therapy | CD4 >200 cells/µ | Yes |

- Work is ongoing on safety of stopping treatment for toxoplasmosis encephalitis, cryptococcal meningitis and CMV retinitis in the setting of sustained CD4 cell count recover.

## Activity 2: Common Bacterial Infections Associated with HIV/AIDS

- *Streptococcus pneumoniae*
- *Haemophilus influenzae*
- *Pseudomonas aeruginosa*
- *Staphylococcus aureus*
- *Klebsielia pneumoniae*
- *Nocardia asteroides*

## Activity 3: Tuberculosis and HIV Infection

- 33% of the global population is infected with TB.
- Among HIV-negative population, latent TB infection carries a 10% lifetime risk of progressing to active TB.
- Among HIV-infected persons dually infected with tuberculosis, however, annual risk of progressing to active TB is 10%.
- HIV epidemic has therefore led to a general escalation of TB incidence.

### Impact of TB on HIV

- Active TB accelerates progression of HIV infection.
- There is a higher risk of other opportunistic infections and death among TB/HIV co-infected persons than among persons infected with HIV alone.
- TB is associated with a 5-160 fold increase in HIV viral replication.
- This risk may reduce after successful TB treatment.
- Treatment of HIV in patients with active TB or vice-versa, presents several challenges to the clinician in resource-poor settings.

- It is important that all clinicians in poor resource settings become familiar with these challenges and with options available for management of co-existing disease.

## Challenges to clinicians

- Diagnosis of TB in HIV infected persons
- Drug – drug interactions between ARVs and Anti-TB drugs (the NNRTI Nevirapine, and Protease Inhibitors versus Rifampicin)
- Overlapping toxicity profiles between ARVS and first line Anti-TB drugs
- Non-adherence to complicated regimens

## Diagnosing TB in HIV infection

- Active TB can occur at any clinical stage of HIV/AIDS, whereas disseminated Mycobacterium avium complex (MAC) infection can occur at CD4 counts below 50 cells/$mm^3$
- Atypical presentation of TB is more likely with advanced HIV disease or AIDS.
- In TB/HIV co-infection, sputum smears are less likely to be positive than among HIV negative individuals.

## Sputum Microscopy

- Sputum Microscopy for acid – alcohol – fast bacilli (AFBs) is the major laboratory procedure used in case-finding for the implementation of the Directly Observed Treatment Short Course (DOTS) strategy for TB control in resource – limited settings.
- Sensitivity of Sputum Microscopy is lowest in persons with significant immuno-suppression and progressive or disseminated disease. It can be improved by:
  - Teaching patients improved sputum expectoration techniques
  - Use of concentration methods in sputum processing for AFBs. (Culture for Mycobacteria is standard diagnostic method in many countries and molecular methods are available in advanced countries).
  - 3 Serial sputum samples should be collected: A spot, an early morning, and a second spot specimen when the early morning specimen is returned to laboratory by patient.

## Tuberculin Skin Testing

- This is a crude diagnostic tool with false positive and false negative results.
- TB/HIV co-infected persons with advanced disease may show negative tuberculin sensitivity reactions.
- A Mantoux reaction of >5mm may be significant among HIV positive persons.

## Chest Radiography

- Chest radiography varies depending on degree of immuno-suppression
- 10% of HIV infected persons with PTB may have normal chest radiographs.
- About 90% may have abnormal chest radiographs.
- Classic apical infiltrates and cavities are seen in only 1/3 of HIV/TB co-infected persons, when CD4 counts have fallen to around 200. Hilar lymphadenopathy and pleural effusions occur in advanced disease.
- Mycobacteremia and extra pulmonary TB especially meningitis are more common in low CD4 count.

## Drug treatment of HIV

### First line recommendations for HIV/TB patients

- d4T, ZDV or TDF / 3TC or FTC / NVP or EFV if during non-Rifampicin-containing continuation phase
- d4T, ZDV or TDF / 3TC or FTC / EFV if during Rifampicin-containing intensive or continuation phase.

### Recommendations for individuals with TB disease and HIV co-infection:

| CD4 cell count | Recommended regimen | Comments |
|---|---|---|
| CD4 <200 /mm$^3$ | Start TB treatment. Start ART as soon as TB treatment is tolerated (between 2 weeks and 2 months)[a] | Recommend ART. EFV is contraindicated in pregnant women during the 1st trimester or women of childbearing potential without effective contraception. |
| CD4 200-350 /mm$^3$ | Start TB treatment. Start one of the regimens below after intensive phase (start earlier if severely compromised). | Consider ART |
| | | |
| | EFV-containing regimen or NVP-containing regimens in case of Rifampicin-free continuation phase TB treatment regimen. | |
| CD4 >350 /mm$^3$ | Start TB treatment | Defer ART |
| CD4 not available | Start TB treatment | Consider ART |

- Children with tuberculosis co-infection (that require Rifampicin containing regimen for TB treatment) should use d4T or ZDV/ 3TC / EFV (3 years and above).

## Impact of ARV drugs on TB

- ARVs reduce the risk of developing active TB.
- ARVs reduce the risk of death among HIV infected persons who develop active TB.
- ARVs have reduced incidence of TB infection among persons with HIV infection.

## Drug – drug interactions

- Key locus of interaction between ARVs and Anti-TB drugs is Cytochrome P450-3A in intestinal wall and liver
- The rifamycins are the most potent inducers of Cytochrome P450-3A.
- Rifampicin is the most potent, followed by Rifapentin. Rifabutin is the least potent inducer.
- NNRTIs e.g. Nevirapine, and PIs (with the exception of ritonavir) are metabolized by Cytochrome P450-3A. Rifampicin reduces the concentration of PIs by 75-95%. This would cause marked reduction of their anti-viral activities in vivo, and lead to the more rapid emergence of resistance to these ARVs.

- Thus among PIs, only ritonavir can be used with rifampicin.
- PIs on the other hand are potent inhibitors of Cytochrome P450-3A. They increase serum concentrations of drugs metabolized by this enzyme system, e.g. Rifampicin, Rifabutin, and Rifapentin, to toxic levels. Concurrent administration of most PIs with rifabutin causes 2- to 4-fold increases in rifabutin levels, causing clinical toxicity requiring dose modifications of rifabutin.
- Some of the drug-drug interactions are very dramatic, justifying strong contraindications to the concurrent use of certain rifamycins and ARVs.

## Recommendations for Concurrent Treatment of TB and HIV/AIDS in Nigeria.

- TB is a major cause of rapid progression and death in HIV-infected persons.
- Drug treatment of active TB should be a top priority in both HIV positive and HIV negative persons.
- The aims of anti-TB drug treatment are to:
  - cure the patient of TB
  - prevent death from active TB or its late effects
  - prevent TB relapse
  - decrease TB transmission to others.
- The high potency bactericidal drugs rifampicin and isoniazid, with pyrazinamide provide sterilizing action in which all populations of tubercle bacilli are killed.
- Rifampicin is the most effective sterilizing anti-TB drug, and is therefore a very essential component of any TB treatment regimen.
- HIV/TB patients in Nigeria perhaps mostly present in health care institutions as active TB patients who are simultaneously diagnosed HIV positive. They may also be individuals with established HIV infection and newly diagnosed TB. In the first category, patient is not on anti-retroviral therapy (ART), but may or may not be a candidate for it. In the second category, patient may already be on ART.
- If ART is contemplated during treatment of TB in HIV infected patients and can be delayed or deferred, **use a rifampicin-based, four-drug anti-TB regimen** in the intensive phase of treatment only (rifampicin, Isoniazid, pyrazinamide and ethambutol). **Defer ART for those two months of the intensive phase** of anti-TB treatment.
- Confirm sputum conversion to negative after intensive phase before switching patient over to continuation phase of treatment.
- In Continuation phase, patients should be on INH and ethambutol. Duration of this phase should be for the duration recommended by the National TB Control Programme for Drug Management of TB (daily, for a minimum of 6 months).
- ART can safely be initiated in the continuation phase.
- For patients already on ART, or those for whom ART cannot be deferred,rifampicin can be given with Efavirenz, an alternative NNRTI to nevirapine.
- Non- rifampicin based anti-TB regimens are inferior, and do not rapidly sterilize sputum.
- All patients on anti-TB drugs especially those concurrently on ART, should be on daily pyridoxin 50mg p.o., as prophylaxis against peripheral neuritis.
- Thiacetazone should be avoided in HIV positive persons.
- NRTIs are not significantly affected by rifampicin, thus no change or dose adjustments are required.

## Overlapping toxicity profiles

- Both ARVs and some Primary Anti-TB drugs may cause or aggravate an already existing derangement of liver functions.
- Paradoxical worsening of TB characterized by development of new signs or symptoms of TB disease, or the exacerbation of existing manifestations of TB, can occur in patients on appropriate anti-TB treatment. Its incidence is higher among HIV positive than HIV-negative persons. See section on Immune Reconstitution Syndrome.
- Monitor liver function by checking liver enzymes levels before commencement of treatment and periodically during follow-up, as in the guideline for use of ARVs in Nigeria.

## Prevention of active TB in HIV infected persons

- There is a 10% annual risk of progressing from latent to active TB in HIV infected persons.
- Controlled clinical trials have demonstrated significant reduction of the incidence of active TB among HIV positive, PPD positive patients using isoniazid prophylaxis
- In a high-burden country like Nigeria where risk of exposure to TB is high, all HIV positive persons should undergo a 5 TU Purified Protein Derivative (PPD) skin test during initial evaluation and yearly thereafter for PPD-negative individuals. This will help identify early, those co-infected with TB.
- Those with =>5mm skin reaction should be screened further for active TB (further history, physical examination, CXR, Serial sputum microscopy for AFBs).
- For those found with active TB, full therapy should be initiated.
- For those with a positive PPD reaction and negative sputum smears and CXR, preventive therapy (chemoprophylaxis) of latent TB with isoniazid 300mg daily for 9 months, with daily pyridoxine 25-50mg.
- Measures to encourage adherence must be taken.
- Ideally, laboratory monitoring should include baseline and interval liver function tests, including serum bilirubin and aminotransferases.
- PPD-negative individuals with recent history of exposure to active TB cases should also benefit from chemoprophylaxis of TB.

## Prevention of primary infection

- Comprehensive infection control measures should be taken in hospitals, prisons, shelters, camps, hostels, and group homes to prevent transmission of TB to susceptible persons, which include HIV positive persons.
- Both sputum smear positive and negative TB cases are capable of transmitting TB
- Early identification of cases using sputum smear, CXR and culture for Mycobacterium tuberculosis in settings listed above, and placement on curative treatment, are good measures.
- Isolation of suspects until fully assessed may be necessary in institutions where a large number of persons are at risk...

## *Mycobacterium avium* complex

- Risk of bacteremia increases as the CD-4 count drops below 100 cells/uL.
- Beyond this threshold, the risk of MAC bacteremia is 8% per year.
- Signs and symptoms are: Constitutional symptoms such as fever, night sweats,weight loss, anorexia.; hepatomegally with up to 90% having elevated alkaline phosphatase; lymphadenopathy and splenomegally; bone marrow involvement occurs early with up to 80% having anemia

- Treatment
  - Resistance always develops in monotherapy. Triple drug regimens are indicated. When resistance develops, do not change just one drug
  - 90% respond to proper therapy
  - Substantial clinical improvement in 4-6 weeks. Sterile blood cultures by 12 weeks.
  - Consider prophylaxis when CD4 < 50 cells/uL
  - First line therapy: Macrolides which decreases bacteremia risk by 70% eg Clarithomycin 500 mg bid, azithromycin 1200/wk
  - Second line therapy: Rifabutin which decreases bacteremia risk by ≥ 50% eg Rifabutin 300 mg/day
  - Other combinations are a Macrolide antibiotic + Ethambutol + A Quinolone antibiotic [sparfloxacin > levofloxacin > ofloxacin > ciprofloxacin] OR Rifabutin

## Activity 4: Common Viral Infections Associated with HIV/AIDS

- **Cytomegalovirus**
  - Presenting Signs and Symptoms are:
    - Fever ± delirium, lethargy, disorientation, malaise, headache most common
    - Stiff neck, photophobia, cranial nerve deficits less common
    - Esophageal ulceration appear in 12-15% of patients
    - Respiratory symptoms, i.e, pneumonitis, present in approximately 1%
  - Management involves the use of Foscarnet 60 mg/kg IV q8h or 90 mg/kg IV q12h x 14-21 days; ganciclovir 5mg/kg IV bid x 14-21 days.
  - Patients without immune recovery will need to be on maintenance therapy lifelong for retinitis
  - For extra-ocular presentations, use ganciclovir and/or foscarnet

- Adenovirus
- **Herpes Simplex infection**
  - Herpes infection is caused by herpes simplex virus
  - There are two HSV types: HSV-1 and HSV-2.
  - HSV requires a moist environment for survival
  - Viral transmission occurs by direct contact, during which virus is inoculated onto a susceptible mucosal surface or through breaks in the skin.
  - During acute primary infection, the virus becomes permanently latent in the nerve root ganglia that correspond to the cutaneous or mucous membrane site of inoculation.
  - Following orolabial infection HSV becomes latent in the trigemnial ganglia.
  - After genital or anorectal infection, it becomes latent in the sacral ganglia.
  - Early in the course of infection virons travel from the site of inoculation along sensory nerves to the corresponding nerve root or trigemnial ganglia.
  - Most commercially available serologic techniques do not reliably differentiate between antibodies to HSV-1 and those to HSV-2. However, two new tests, the Western blot assay and an immunoassay specific for antibody to HSV glycoprotein G, are capable of determining accurately whether a patient has antibodies to HSV-1 or HSV-2 alone, both virus or neither virus.

- Of the many laboratory techniques available for diagnosis of mucocutaneous HSV infection, direct virus culture of material from suspected lesions remain the diagnostic procedure of choice.
- Virus culture is more sensitive and specific than demonstration of multinucleated giant cells or inclusions by the Tzanck smear, direct staining of infected, cells for virus antigen, antibody detection and identification of virus particles by electron microscopy.
- Primary or recurrent infection with herpes simplex virus (HSV) is common in HIV disease.
- Illness is often more severe, more invasive and of longer duration than the immuno-competent host.
- The clinical presentation of HSV infection in patients with advanced HIV disease may differ from that in the normal host.
- The severity of illness depends on several factors, including whether HSV infection is primary, initial and non-primary or recurrent. Severity of illness may also depend on the site of infection and the degree of HIV-induced immuno-suppression.
- Although both HSV types can cause infection at any anatomic site, HSV-1 more often infects orolabial sites and HSV-2 genital and anorectal site.
- Syndromes of HSV infections in advanced HIV disease are listed below:
- Mucocutaneous Infections
    - Gingivostomatitis
    - Recurrent fever blister
    - Intranasal ulceration
    - Genital ulceration
    - Perianal ulceration
    - Visceral Infections
    - Esophagitis
    - Proctitis
    - Encephalitis
    - Keratitis

## Treatment

- The antiviral drug acyclovir, a nucleoside analogue is currently the treatment of choice for HSV infection.
- Acyclovir is available in tropical, oral and intravenous preparations. Route, dosage and duration of therapy depend on the type and severity
- of HSV infection.
- Topical acyclovir is not effective for recurrent herpes labialis but is occasionally useful in primary genital HSV infection.
- Oral acyclovir in a dose of 200-400mg five times a day is indicated for mucocutaneous disease associated with HIV infections.
- Intravenous acyclovir should be used in patients with severe mucocutaneous HSV disease; involvement of viscera, such as brain, eye, oesophagus, neurologic complications, such as transverse myelitis or atonic bladder.
- Ocular HSV infection should be treated with trifluridine.
- Acyclovir cannot eliminate latent virus from ganglia and severe, prolonged, and frequent recurrences may occur after discontinuation of therapy.
- Acyclovir-resistant strains of HSV with thymidine kinase or DNA polymerase mutations have been reported with increasing frequency. Viral cultures and

sensitivity testing should be performed in patients whose symptoms do not improve with standard therapy.
- Some reports have documented that acyclovir resistant HSV isolates have been sensitive to either Foscarnet or Vidarabine and also to treatment with HPMPC, an acylic nucleoside phosphonate analogue or topical trifluridine.

## ➢ Varicella Zoster Virus

- Varicella-zoster virus (VZV), a herpesvirus, causes both varicella (chickenpox) and zoster (shingles).
- As with other herpesviruses, VZV causes both an acute illness and chronic lifelong latent infection.
- The acute primary infection (varicella) usually occurs during childhood. In a child with normal cellular immunity, primary VZV infection is relatively benign and self limiting. In adults however, primary infection
- can be more severe because systemic manifestations and occasional visceral dissemination occur.
- Patients with cellular immunodeficiency, regardless of age, are at risk for severe cutaneous or visceral varicella.
- Humans are the only natural host of VZV.
- Transmission occurs through direct contact with infectious lesions or inoculation of aerosolized infected droplets onto a susceptible mucosal surface.
- Infectivity usually begins 1-2 days before the onset of rash and persists until all vesicular lesions are dried and crusted, usually for a period of 5 to 7 days.
- On primary infection, the virus usually replicates in tonsillar and lymphoid tissue.
- Primary viremia develops 4 to 7 days after initial infection, and virus then spreads to internal organs.
- A secondary more prolonged viremia occurs approximately 14 days after the initial infection, resulting in cutaneous infection and the characteristic vesicular rash of varicella.

➢ Moluscum Contagiosum
➢ Human Papilloma Virus

## ➢ Co-infection with hepatitis B and or C

- Due to shared routes of transmission, co- infection with hepatitis C virus (HCV) and hepatitis B virus (HBV) is common in those with human immunodeficiency virus (HIV).
- The overall prevalence of HCV in HIV-infected individuals is approximately 15%-20%
- This is dependent on the population, with 80%-90% of injection drug users testing positive compared to 5%-10% of those who acquired infection from male-to-male sexual activity.
- Although the prevalence of past exposure to HBV is high (90-95%), active infection with HBV is less common and occurs in 10% - 15% of those co-infected with HIV.
- Little data are available on HIV/HCV/HBV triple infection as most studies on HCV or HBV in HIV patients have excluded patients with other liver diseases. Consequently, the prevalence of HIV/HCV/HBV triple infection is not known but is estimated at 1%-5%.

- Recent data in the era of highly active antiretroviral therapy (HAART) have shown similar histology in HIV patients co-infected with HCV compared to HIV-uninfected HCV controls.
- The impact of HBV and HCV on the progression of HIV is unclear. Whereas some studies have shown a more rapid progression to AIDS in those with HCV co-infection, other have not been able to demonstrate such a progression of HIV in those co-infected with either HCV or HBV.
- Although there are little data on the effect of triple infection with both HBV and HCV on the progression of HIV disease, it appears that HCV infection has a greater impact on CD4 cell recovery after initiation of HAART compared to HBV infection.
- Finally, although most patients with HCV or HBV co-infection tolerate HAART well, there is an increased risk of HAART hepatotoxicity in patients with HCV or HBV co-infection.
- Treatment of HCV in the setting of HIV co-infection includes the use of interferon alpha (IFNá) and ribavirin (RBV). Although response rates have been suboptimal, with sustained virologic response rates of 20%-30%, preliminary results of ongoing clinical trials with pegylated IFNá and RBV combination therapy are encouraging.
- Treatment of HBV in HIV-infected patients is more controversial. However, all patients with active replication (HBV DNA > 100,000 copiesmL) should be considered for therapy. In those with low-titer HBV DNA (<50,000 copies/mL) and negative for HBeAg (occult HBV infection), treatment may be of little value and these patients can be observed.
- Use of IFNá for HBV in HIV has been disappointing.
- Although short-term use of lamivudine can lead to HBV DNA clearance in the majority of patients, continued use results in a high rate (20% per year) of HBV resistance associated with the emergence of YMDD mutations. This is especially true in those on lamivudine to help control HIV infection.
- Newer medications such as adefovir are effective against HBV and are associated with low rates of HBV viral resistance. However, their use in HIV-coinfected patients has not been well studied.
- Although there are limited data on the use of tenofovir to treat HBV in HIV co-infection, results from ongoing trials are awaited.

## Activity 5: Common Fungal Infections Associated with HIV/AIDS

- These infections usually occur when the CD-4 count drops < 200 cells/uL.
- These are organisms that depend upon the cellular immune system for control and eradication.
- ***Pneumocystis carini (jirovesi)***
  - Although *Pneumocystis carini* has long been considered a protozozoan, recent studies of ribosomal RNA from the organism have shown greater homology with fungi, suggesting that it should be reclassified.
  - Such a reclassification has no immediate importance but may suggest new therapeutic approaches.
  - Although evidence in human has not been documented animal studies suggest the possibility of persons-to person respiratory transmission of the organism.

- A distinct form of *P. carini* infection emerged in the mid 1950s manifesting as a diffusing alveolar pneumocystosis that affected children and adults suffering from drug-induced, neoplastic or congenital immune deficiency.
- Although sporadic in distribution, the reactivation type of pneumocystosis was the most common variety seen in the developed countries.
- Extrapulmonary and disseminated disease were rare, almost always appearing in conjunction with pneumonitis.
- Pneumocystis carini pneumonia (PCP) is a common opportunistic disease that occurs almost exclusively in persons with profound immunodeficiency.
- The most common underlying conditions associated with PCP were leukemia, Hodgkin's disease and other lymphomas, primary immuno-deficiencies and organ transplant.
- Available data suggested an epidemiological pattern of some seasonal periodicity in the occurrence of PCP; similar to that seen with upper respiratory tract infections.
- Patients with PCP usually experience the sudden on set of severe respiratory comprise. Such constitution symptoms as fever, anorexia and lethargy may overshadow localized pulmonary complaints.
- Although cough occurs, it is seldom productive.
- Dyspnea is common but may go unnoticed in a sedentary patient and chest pain is rare.
- The patient may have a low-grade fever, and the lungs are either clear or reveal dry bibasilar rales on auscultation.
- Clinicians first recognized HIV disease as a cluster of patients with PCP who did not have any recognized immunodeficiency state.
- Prior to the widespread use of antipneumocystis prophylaxis, PCP alone accounted for 43% of all opportunistic infections in patients with advanced HIV infection seen in the developed countries.
- With or without Kaposis Sarcoma (KS) PCP was the Centres for Disease Control (CDC) defined index diagnosis in 62% of patients with HIV in the developed countries.
- In these countries, PCP is still the most common life-threatening opportunistic infection occurring in patients with HIV-infection.
- Cases of PCP have been less reported in the developing countries like Nigeria. This is probably due to the fact that capacities for the diagnosis of PCP in these are very minimal or non-existent.
- Data have further shown that the lower the absolute CD4 cell count of HIV-infected patients, the higher the likelihood of developing PCP.
- It has been documented that patients with CD4 counts of 200 cells/µl or less were 5 times more likely to develop PCP compared with patients with CD4 counts of more than 200 cells/µl.
- In early stages of the infestation of the lungs, there are few cysts and no inflammatory responses. Multiplication of the organism is predominantly extra cellular. As the infestation grows, more alveoli fill with organisms and exudates, producing defects in lung function.
- Type 1 and Type 2 alveolar cells hyperthrophy and mononuclear cells infiltrate. Eventually, the alveolar cells desquamate, resulting increased
- permeability of the alveolar capillary membrane with consequent pulmonary edema.

- Extrapulmonary *P. carinii* infections are rare but do occur and usually have a wide variety of locations and clinical presentations thus posing a diagnostic problem.

## Diagnosis

- Because of the diverse presentations of PCP, patients often do not appear with a "classic" presentation.
- However, typically patients present with fever, dry cough and shortness of breath or dyspnea on exertion, oftentimes of a gradual onset over several weeks. In HIV infected patients, the clinical presentation is often insidious with slow but steady progression of fatigue, fever, chills, sweats and exertional dyspena.
- Physical findings are sparse and laboratory findings are also non specific.
- Full blood counts and sedimentation rates show no characteristic pattern in patients with PCP.
- Serum chemistries are not particularly helpful, however, the serum LDH
- concentration is frequently increased. The serum LDH concentration, although a nonspecific indicator of lung parenchymal damage, appears useful in predicting which patients do well.
- Although antibody testing is helpful as an epidemiologic tool, it presently has no place in the diagnosis of acute PCP.
- Antigen testing, although it may prove a useful adjunct to other tests presently used, needs further evaluation before it is recommended as a routine diagnostic test.
- Serologic testing for *P. carinii* suggests that infection with the organism is widely prevalent in the general population, however, the use of serologic tests for diagnosis has been disappointing.
- A study on the usefulness of an enzyme-linked immunosorbent assay (ELISA) for IgG antibody to *P. carini* and a latex agglutination test for *P. carini* antigen found that although the mean IgG antibody titres of patients with and without acute PCP were not statistically different, antigen titres were both sensitive and specific in identifying patients with
- acute PCP. In addition, antigen titres appeared to parallel the patients clinical course during acute therapy.
- Diffuse interstitial infiltration, occasionally, with peripheral sparing, is the most common radiographic presentation of PCP, occuring in 75% of patients with advanced HIV disease and PCP.
- However, all of the following presentations have occurred: abscesses, cantation or cystic lesions, Lobar consolidation, nodular lessions,
- effusions, pneumothorax and a normal chest radiograph.
- Rare radiographic presentations include patchy upper lobe consolidation imitating tuberculosis, a military pattern and mediastinal and hilar enlargement.
- The radiographic appearance of PCP commonly worsens early in the course of therapy; in the more severe cases, early PCP may progress to air space consolidation.
- However, clinicians should consider deterioration that continues beyond 7 to 10 days, a failure of therapy.
- A diffuse interstitial pattern can occur in other infections common to patients with advanced HIV disease, including CMV, histoplasmosis, TB and MAC infections. These cases of pneumonitis were clinically indistinguishable from cases of PCP, although

the radiographic abnormalities were generally less serious and histologic study showed less alveolar damage than those in patients with PCP.

- Clinical studies have shown gallium scanning of the lung (using gallium 67 and scanning 48-72 hours after injection of gallium) to be very sensitive (90-100%) for PCP but the specificity was as low as 20%.

## Management

- Prophylaxis against and treatment of acute PCP have advanced rapidly in recent years.
- The therapeutic regimens for acute PCP are all 21 days regimen unless indicated otherwise.

### Drug Dose

- Trimethoprim (TMP) TMP: 15-20mg/kg/d in combination with Sulfamethoxazole (SMX) 75-100gm/kg/d (IV or Oral) divided doses of 6 hourly. A rare percentage of patients have adverse effects necessitating change of therapy.
- Sulfamethoxazole (SMX) SMX: 75-100gm/kg/d
- Pentamidine 3-4mg/kg/d. (IV once daily). A large percentage of patient have adverse reactionneccesitating change of regimen
- Dapsone (DS) DS: 100mg/d. with TMP: 15-20mg/kg/d (both oral). Do G6PD Screen when starting dapsone

➢ ***Cryptococcus neoformins***

- Distributed world-wide.
- Present in soil that is contaminated by birds
- There are multiple other hosts.
- A characteristic thick capsule (anti-phagocytic) capsule with budding of smaller, "daughter cells".
- About 2% of patients with AIDS present with Cryptococcal infection, and over 10% of HIV-positive patients eventually develop it during the course of their illness.
- The CD-4 count is almost always < 100 cell/uL unless there are concurrent risk factors.

➢ ***Histoplasma capsulatum***

- In some parts of the world, it is the second most common opportunistic infection.
- Lives in acidic soils contaminated by bats or birds.
- May remain viable in soil for years.
- At the initial of infection, inhaled microconidia yeast form within airways and/or alveoli. Then macrophages ingest the yeast. The yeast proliferates within the macrophages. A specific cell-mediated inflammatory response then occurs. A reticulonodular pneumonitis may result.
- If the cell-mediated inflammatory response is successful, the organism is contained within granulomas. Granulomas may heal with irregular, stippled, or laminated calcifications.
- This develops in about 10% of HIV-seronegative patients. The exact incidence in HIV-seropositive patients is not known.
- About 30% of HIV+ patients who develop progressive pulmonary disease have a negative or unimpressive chest X-ray. The Chest X-ray may show hilar and

mediastinal adenopathy, and patchy infiltrates. Of those with progressive disease: 33% have no known risk factor, 50% are immunosuppressed, and 17% are over the age of 55 years.

- Symptoms include: Fevers, dyspnea, pleuritic chest pain, anorexia, cough that may be productive and hemoptysis may occur.
- Other manifestations include: Bone marrow invasion, increased LFTs, skin lesions, adrenal involvement, endocarditis
- Reactivation of the disease typically occurs when the CD-4 count drops lower than 200 cell/uL. Only 30% of HIV-positive patients with reactivation disease have fevers. Most have non-specific constitutional symptoms such as weight loss and fatigue. A fibrotic response to the presence of live or dead fungal organisms may occur.
- Diagnosis is by culture of involved tissue(s), serology is positive in 75% of normal hosts. Urine or serum antigen is positive in approximately 90% of normal hosts. Tissue biopsy shows macrophage involvement
- Therapy is almost always indicated. Amphotericin: Drug of choice for induction treatment.
- Maintenance therapy: Itraconazole > amphotericin > fluconazole

➢ ***Blastomycosis dermatitidis***

- Endemic to areas with warm, moist soils rich in organic material
- The lung is the primary site of infection. Dissemination may involve any organ, but most common are: Lung > Skin > Bone > Gatrointestinal System
- Skin is involved in 40-80% of cases. A characteristic response is pseudoepithelial hyperplasia with micro-abscesses. The organism is found in the periphery of the skin lesions.

➢ ***Coccidiodiodes immitis***

- Spherules that reproduce by internal sporulation.
- One of the few invasive fungal infections that can be transmitted by vectors.
- Symptoms: Cough > Fever > Chest pain > headache > dyspnea > rash
- About 1% of normal hosts develop extra-thoracic disease. Higher proportion of immunosuppressed hosts develop this. Sites of extrapulmonary disease include: Skin (often the face) > Subcutaneous soft tissues >Musculoskeletal (30% of patients) > CNS (10% of patients) (subacute or chronic meningitis)

➢ ***Aspergillus* spp**

- Typically occur with advanced AIDS associated with other risk factors such as neutropenia.
- Usually pulmonary infections that cavitate.
- Often associated with hemoptysis.
- Other common sites of infection: Brain and paranasal sinues.
- Causes tissue infarction due to the propensity to invade blood vessels

➢ Dermatophyte infections

➢ ***Candidiasis***

- Candidiasis is a disease condition that is caused by infection with some species of Candida.

- Although there are many species of Candida, only a few are important pathogens in humans.
- Pathogenic species include *C. albicans*, *C. tropicalis*, *C.parapsilosis* with a few other less common isolates.
- Candida Species are the most frequent fungal pathogens in HIV-infected patients.
- The frequent occurrence of mucous membrane candidiasis in HIV-infected patients underscores the importance of T-cell mediated immunity in protection against superficial Candidal infections.
- Thus immunosuppression, rather than a novel or hypervirulent strain of Candida causes the high frequency of candidal infections in
- HIV-infected patients.
- Candida infections can be divided into these two broad groups:
  - Mucocutaneous; often the common form of infection.
  - Systemic; a rare form of the infection.

- Chronic mucocutaneous candidiasis is a syndrome characterized by T-cell dysfunction and persistent and recurrent candidal infection of the skin, nails and mucocutaneous membranes.
- The major sites of infection are the oral cavity, the gastrointestinal tract (GI) and the vagina.
- Oral candidiasis (thrush) is the most common infection of the oral cavity. They appear as cordlike patches on the tongue and buccal mucosa. Although relatively common in normal, non-HIV-infected newborns (approximately 5%), oral thrush in adults usually involves some predisposing risk factor, such as steroid use, chronic illness (e.g. diabetes) immunodeficiency and antibiotic use.
- Oral Candidias is the most common fungal infection in patients with HIV/AIDS and is independently predictive of progression to AIDS. The likelihood of thrush, which generally develops in patients with CD4 counts less than 500 cells/mm3 and increases as the CD4 counts decline.
- Candidiasis of the GI frequently involves the oesophagus.
- Most cases of candidal oesophagitis occur in patients with obvious risk factors for fungal infection.
- About 50% of non HIV-infected patients with oesophagitis present with oral thrush. Thus the absence of thrush does not rule out the diagnosis of candidal oesophatitis.
- In patients with advanced HIV disease with oesophageal candidiasis, oral thrush is almost always manifested.
- The most common symptoms include painful swallowing (odynophagia), dysphagia, retrosternal pain and nausea.
- Candida infection of the stomach and of the small and large intestines in less frequent than esophageal candidiasis in both HIV and non-HIV-infected subjects.
- Most cases occur in non HIV infected patients with hematologic malignancies treated with cytotoxic agents or corticosteroids.
- Candida vaginitis is a common infection in women that is characterised by a thick vaginal discharge pruritus and erythematous swelling of vaginal membranes and labial region.
- Women infected with HIV have more frequent episodes of candidal
- vaginitis, the duration of their episodes is prolonged considered in any patient with unexplained thrush.

- Thrush can be easily diagnosed clinically as they present as creamy plaques that can be partially scrapped off the mucosal surface with tongue blade or spatula.
- Identifying the yeast and pseudohyphae in the oral scrapings treated with 10% KOH (potassium hydroxide) should be used for clinical diagnosis and confirmation of oral candidiasis.
- Culture of swabs of oral lesions are not useful as Candida exists in the mouth of persons without Candidiasis.
- Observation and biopsy during oesophagoscopy lead to the definitive diagnosis of candidal esophagitis.
- Characteristic endoscopic findings include patchy white plaques overlying a friable mucosa.
- Vaginal candidiasis should be suspected in a woman with known HIV infection or appropriate risk factors, who complains of increased vaginal discharge, or vaginal and vulvar pruritus.
- Vaginal examination usually shows a thick discharge from an erythematous membrane.
- KOH preparations of the discharge allow identification of hyphae and pseudohyphae indicative of candidal infection.
- Cultures of vaginal discharge should not be performed since they often indicate the presence of candida in women who have no evidence of vaginitis.

## Management

- The standard treatment for thrush is clotrimoxazole troche (10mg) allowed to dissolve slowly in the mouth 3 to 5 times a day for 7 to 14 days. Nystatin is also available though a less effective anticandidal agent. It available as pessaries, vaginal tablets or suspension (containing 100,000 to 1,500,000 units) and can be used as mouth wash every 4 to 6 hours. A short course of systemic antifungal therapy often leads to rapid clearance of infection and may be cost-effective in comparison to daily topical agents.
- Systemic therapy with Ketoconazole (200-400mg) given daily for 7-14 days is usually effective.
- In patients who do not tolerate Ketoconazole due to toxicity, fluconazole is an effective and well tolerated (but more costly) alternative.
- Oral antifungal therapy is the preferred mode for candidal oesophagitis.
- Treatment with Ketoconazole or fluconazole should continue for at least 2 weeks, or for at least 1 week after symptoms have resolved. Some data indicated that fluconazole was more effective than ketoconazole in patients with advanced HIV disease with oesophagitis.
- Tropical preparations of antifungal agents such as Nystatin and Clotrimazole, should be the initial therapy for Candida Vaginitis. Oral antifungal therapy is indicated if tropical therapy fails or vaginitis recurs readily after therapy. Ketoconazole (400mg per day orally for 14 days) is frequently effective. In women who are unable to tolerate ketoconazole or in whom ketoconazole has failed, fluconazole (200mg per day orally) is an effective alternative. Ketoconazole is embryotoxic and is contraindicated in pregnancy.
- Disseminated candidiasis is treated with standard doses of intravenous amphotericin B (0.6 – 0.8mg/kg/day) for 6 to 8 weeks.

## Activity 6: Common Protozoal/Parasitic Infections Associated with HIV/AIDS

- For parasites and HIV co-infection, there are a few opportunistic parasites and others which could be classified as weakly or not opportunistic.
- To date, the major parasitic infections of humans, malaria and helminths, have not been strongly associated with exacerbation of disease.
- The opportunistic organisms are associated with diarrhea (microsporidia, cryptosporidia, cyclosporidia, etc.) and pneumonia (pneumocystis).
- In addition to these opportunistic infections, patients in western countries may also have re-activation disease, such as toxoplasmosis and leishmaniasis
- Opportunistic protozoan causes diarrhea and weight loss in AIDS
- Small bowel-biopsies of AIDS patients with chronic unexplained diarrhea have shown intracellular microsporidia in up to 20-30% of cases.
- *Entamoeba histolytica*

- ***Giardia lamblia***
  - Clinical symptoms may evolve and present as enteritis, watery diarrhea ± malabsorption, bloating and flatulence
  - It is a common cause of diarrhoea in general population, but may be recurrent or more severe in HIV patients
  - Most cases are readily treated with sulfamethoxazole/ trimethoprim (960 mg qid for 10 days) followed by 1 double strength tablet (960 mg bid for 3 weeks), then chronic suppression with sulfamethoxazole/ trimethoprim (960mg daily)
  - High dose of pyrimethamine with calcium folinate is needed to prevent myelosuppression
  - Long-term maintenance therapy may be required to prevent relapse.
- **The Helminths**
  - Helminth infections tend to bias the immune response towards Th2-type. This has been considered to be deleterious to HIV co-infected patients immune system.
  - Several studies have suggested that helminth and HIV co-infected patients have higher viral loads than do non-helminth infected cohorts.
  - Filariasis increases susceptibility to HIV infection in peripheral mononuclear cells in vitro
  - Schistosomes are potent Th2 drivers nd inducers of IL-10.
  - There are suggestions that helminth co-infection causes have higher viral loads than do non-helminth infected individuals.The data to support this is poor.
  - Viral load shown to actually increases when schistosome infected patients are treated.
  - Does HIV/AIDS increase the pathology of schistosomiasis? Increase pathology is caused by the host immune response to parasite eggs trapped in the liver, lungs or the bladder.
  - Egg granuloma formation protects against hepatotoxic antigens and is CD4+ mediated.
  - Also, individuals with low CD4+ T cell counts pass fewer eggs than individuals with normal CD4+ T cell counts with the same worm burdens.
  - These patients also have high liver enzyme levels, suggesting progressive liver damage.
  - Good news is that praziquantel treatment is still effective in patients with AIDS.

- *Toxoplasma gondii*
  - Toxoplasma gondii is an ubiquitous protozoan parasite of birds and mammals and an obligate intracellular parasite. Human infection common, but in general poses a risk only to the immunodeficient patient and the infant in utero.
  - Infection occurs by ingestion of tissue cysts in poorly cooked meat or oocysts shed in faeces of cats. Infection of intestinal epithelial cells is followed by dissemination throughout the body; tachyzoites invade cells, replicate and destroy cells. As host develops immunity, parasites become dormant within tissue cysts, generally remain dormant unless immunosuppression occurs.
  - Transmission also transplacental, via organ donation or blood transfusion.
  - Reactivation occurs in 30-45% of seropositive AIDS patients, usually when CD4 count is < 100/mm3. A minority of cases of active toxoplasmosis among AIDS patients due to acute acquired infection. Rates of active disease decreased among persons taking HAART.
  - Congenital toxoplasmosis (usually with HIV co-infection) seen in infants of HIV-infected mothers, even if infection with toxoplasma occurred years before conception.

- *Trypanosoma cruzi*
  - Trypanosoma cruzi infects approximately 20 million persons in Latin America, and over 300,000 Latin American immigrants living in the United States.
  - Most reported cases of co-infection with HIV and *T. cruzi* were the result of reactivation of chronic trypanosomiasis in persons with low CD4 counts.
  - Treatment with use of Nifurtimox (no longer manufactured, only available from CDC, Atlanta)
  - Benznidazole (Rochagan), which is available in Latin and South America, reduces parasitemia but does not usually eliminate parasite.

- *Sarcoptes scabiei*
- *Cryptosporidium spp, isosporiasis, and cyclosporiasis*
  - All three cause a self-limited diarrheal illness with flu like symptoms in healthy persons and persistent diarrhea with potentially massive fluid loss and malnutrition in persons with AIDS.
  - Transmission by ingestion of contaminated food and water; cryptosporidia also transmitted directly from person to person (especially in day care centers) and from animals (especially livestock) to persons.
  - *Cryptosporidium* has caused city-wide waterborne outbreaks, such as that which affected thousands of persons in Milwaukee in April, 1993. Recent outbreaks of cyclosporiasis in various US cities attributed to ingestion of poorly washed imported fruits.
  - Isosporiasis and cyclosporiasis found in developing countries, cryptosporidiosis common in temperate and tropical areas.
  - Isospora and cyclospora respond to trimethoprim and sulfomethoxazole or pyrimethamine and sulfonamide.
  - No consistently effective treatment for cryptosporidia.
  - As with microsporidia, HAART may be best therapy if immune re-constitution is observed.

## Activity 7: Malaria and HIV Infection

- Current understanding of the human immune response to malaria and HIV leads us to expect that either infection might influence the clinical course of the other.
- Many other types of infections are associated with at least a transient increase in HIV viral load. Hence, it is logical to expect malaria to do the same and potentially to accelerate HIV disease progression.
- On the other hand, the control of malaria parasitaemia is immune mediated, and this prevents most malarial infections from becoming clinically apparent in semi-immune adults in endemic areas. The immune deficiency caused by HIV infection should, in theory, reduce the immune response to malaria parasitaemia and, therefore, lead to an increased frequency of clinical attacks of malaria. Surprisingly, evidence of the association between HIV and malaria is scanty, and it is only in the past 10 years that a clearer picture of this association has begun to emerge.

### The Association Between HIV and Malaria

- Clinical studies show an increased rate of placental malaria in HIV-infected pregnant women.
- Infection with HIV-1 causes progressive cellular immuno-suppression, and any resulting impairment in immune response to malaria might be associated with failure to prevent infection or to suppress parasitaemia and clinical disease. However, laboratory-based studies have found that some components of the human immune response to Plasmodium falciparum are modified by HIV-1, but that others are unaffected. On the other hand, P falciparum has been shown to stimulate HIV-1 replication through the production of cytokines (IL-6 and TNF-alpha) by activated lymphocytes. It has also been shown to increase the potential reservoir for HIV in the placenta by increasing the number of CCR5+ macrophages.
- In pregnancy, there is more peripheral and placental parasitaemia, higher parasite densities, more clinical malaria, more anaemia, and increased risks of adverse birth outcomes.
- HIV-infected women remain susceptible to the effects of malaria whether or not they are pregnant.
- Placental HIV-1 viral load is increased in women with placental malaria especially those with high parasite densities.
- However the effect of malaria on mother-to-child transmission of HIV is unclear, with the results of published studies to date giving conflicting findings.
- Recent studies in non pregnant adults show that the underlying epidemiology and intensity of malaria transmission seem to be critical for determining the consequences of co-infection. In areas of stable malaria, transmission is intense and continuous, although seasonal variations may occur. Immunity develops early in life, and young children and pregnant women are at greatest risk of malaria mortality and morbidity. In these areas, HIV-related immuno-suppression may increase rates of malarial infection and clinical malaria disease, however there is no clear evidence of an increase in rates of severe or complicated malaria.
- The odds of parasitaemia and risk of malarial fever increase with decreasing CD4 cell count and increasing viral load. These findings suggest there may not only be interference with parasite control, but also, perhaps more importantly, loss of antitoxic immunity, which protects persons with parasitaemia from clinical disease.
- In regions of unstable malaria, transmission is intermittent, less predictable, and epidemics may occur.

- The disease burden is similar in all age groups, because preexisting anti-malarial immunity is limited. As a result, malarial fever rates are a direct function of parasite transmission rates. Thus the impact of HIV co-infection is on disease presentation, with an increased risk of complicated and severe malaria and death.
- Studies of malaria and HIV interactions in children living in areas of stable malaria epidemiology have been inconclusive.

## Response to Treatment and Drug Interactions

- Antimalarial therapy is most effective in individuals who have acquired some immunity to malaria.
- It would be predicted that response to therapy will be decreased in immuno-suppressed HIV-infected individuals living in regions of stable transmission.
- More recent studies suggest treatment with artemisinin, sulfadoxine-pyrimethamine (SP), and artemether-lumefantrine is less effective in HIV-infected non-pregnant adults.
- No information is available on the most effective antimalarial therapy for non-immune HIV-infected individuals, although case reports of travelers suggest chemoprophylaxis may be less effective.
- Interactions between anti-malarial drugs and antiretroviral drugs (ARVs) mostly involve protease inhibitors (PIs) and nonnucleoside reverse transcriptase inhibitors (NNRTIs).
- The anti-malarial drugs halofantrine, artemether, and/or lumefantrine should not be given to patients receiving PIs (or the NNRTI delavirdine) because of excessive risk of toxicity.
- For patients receiving other NNRTIs (nevirapine or efavirenz) lower concentrations of lumefantrine and artemether may lead to increased risk of treatment failure.
- There is also potential for an interaction between quinine and NNRTI or PI drugs. However, the magnitude and clinical significance of these potential interactions needs further research.

## Public Health Implications of Co-infection

- The association between the 2 infections has important implications. Malaria and HIV-1 are 2 of the most common infections in sub-Saharan Africa and, to a lesser extent, in other developing countries. It is estimated that 25.4 million Africans are infected with HIV, whereas 300 million to 500 million suffer from malaria each year. Therefore, any interaction between these 2 infections will be of public health significance, even if the statistical effect is modest.
- On a population basis, an increased prevalence of malaria and increased parasite density in HIV-infected individuals could lead to increased malaria transmission affecting both HIV-positive and -negative individuals. (This assumes that the frequency, duration, and density of gametocytemia rise in parallel with asexual parasitaemia, which is currently unproven.)
- The increased risk of clinical malaria in HIV-positive subjects could increase the burden on clinical services in areas where HIV-1 is prevalent. The population-attributable fraction of adult malaria due to HIV-1 would be expected to rise in parallel with HIV-1 prevalence.
- In a region with an HIV-1 prevalence of 30%, such as parts of southern Africa, the population-attributable fraction could reach 20% for parasitaemia and 35% for clinical malaria.

### Implications for Clinical and Public Health Management

- In endemic areas, the most relevant immediate action would be to encourage HIV-infected patients to avoid malaria infections, because it appears that these patients are at increased risk of infection and clinical disease. Clinicians should advise their HIV-infected patients to avoid mosquito bites, perhaps most effectively by sleeping under an insecticide-impregnated bed net.
- Alternatives include using mosquito repellents on skin or clothing or sleeping in a room with burning mosquito-repellent coils or tablets. These alternatives are likely to be too expensive for regular use by people living in endemic areas, but may be considered by visiting travelers. Visitors to malaria endemic zones should take prophylaxis, whether HIV-infected or not.
- The use of anti-malarial chemoprophylaxis should be stressed in endemic areas. People living with HIV in these areas may be understandably reluctant to take regular preventive medications, but at-risk groups such as pregnant women and their fetuses are particularly likely to benefit. Intermittent presumptive treatment with at least 3 doses of SP given monthly at routine prenatal clinic visits during the second and third trimesters of pregnancy is probably the most practical public health approach to prevention of malaria-related maternal anemia, low birth weight, and the subsequent higher risk of infant mortality.
- Clinicians need to be aware that HIV infection reduces the effectiveness of anti-malarial treatment. Pharmacovigilance and additional evidence on the efficacy of anti-malarial drugs in HIV infection are urgently needed.
- As a result of studies of cotrimoxazole (trimethoprim-sulfamethoxazole) prophylaxis showing significant reductions in morbidity and mortality in HIV-infected adults, daily cotrimoxazole prophylaxis is recommended for all symptomatic adults and children living with HIV in Africa. The antifolate drug combination cotrimoxazole is quite similar to SP and has a similar effect on malaria parasites.
- There is a risk that widespread use of cotrimoxazole will hasten the development of resistance in malaria parasites to SP, as there is some evidence of P falciparum cross-resistance between trimethoprim and pyrimethamine at the molecular level.
- The WHO recommends that pregnant HIV-infected women should not receive intermittent presumptive treatment with SP if they are already receiving cotrimoxazole prophylaxis. It also follows that HIV-infected individuals receiving cotrimoxazole prophylaxis should be treated with antimalarial drugs other than SP.

## Activity 8: Malignancies in HIV infection

### Kaposi Sarcoma

- The prevalence of Kaposi sarcoma is 20,000 fold higher in HIV-1 infected patients as compared with general population.
- The lower the CD4 cell count the higher is the risk for Kaposi's sarcoma
- Prevalence in Nigeria is not known
- It often presents as brown black macular patches, nodules and papules on the limbs, face, oral cavity and the genitals
- Diagnosis is based on the histology of the lesion.
- Basic fibroblast growth factor concentration in the plasma may be micro-active.
- Serological testing show rise in antibody to human herpes virus type

## Lymphomas

- Non Hodgkin's lymphoma has been reported at increased prevalence in HIV infection.
- Common reported subtypes are:
  - small non-cleaved B-cells (Burkitt's type) 40%
  - large cell lymphoma 30%
  - immuno-blastic plasmacytoid lymphomas 30%.
- Diagnosis is predominantly by histological examination of biopsy tissue.
- Fine needle aspiration of fluid from the cavity of lymphoma may help with the making of a diagnosis
- Effusion can be tapped and subjected to cytological examination.

## Carcinoma of the Cervix

- Invasive carcinoma of the cervix has become an AIDS defining illness
- Squamous intraepithetial lesion, a forerunner of carcinoma of the cervix, occur in 33 to 40% of HIV-infected patients as compared with 7 to 14% of HIV-negative persons
- Screening for squamous intraepithelial lesion is by PAP smear
- PAP smear is recommended as a baseline investigation and to be repeated at 6 months and thereafter once a year.
- Diagnosis of cervical cancer requires one biopsy for histological study.

## Summary

- Major opportunistic infections remain protozoa leading to diarrhoea. This is responsive to HAART.
- Re-activation is still major problem leading to TE and disseminated leishmaniasis.
- HAART does not interfere with anti-malarials.
- Little conclusive data that malaria or geohelminth infections exacerbate HIV.
- In contrast, HIV may exacerbate helminth infections.

# Activity 9: Specimen Handling

- Proper specimen collection is pivotal for the provision of meaningful clinical laboratory information
- Though rigorous laboratory quality assurance procedures are required to assure technically accurate results, such techniques can not safeguard against incorrectly labeled tubes or improperly drawn specimens.
- If the specimen is not correctly labeled or has been compromised by improper collection or handling, results may be misleading or dangerous.
- Blood and other body fluids from people are to be treated as if known to be infectious for HIV, HBV, and other blood-borne pathogens.
- All specimens should be put in a well constructed container with a secure lid to prevent leaking during transport.
- All persons collecting and processing specimens should wear gloves. Gloves should be changed and hands washed after completion of specimen collection.
- All blood specimens received by the laboratory must have a permanently attached label with the appropriate information written in black indelible ink, including the patient's ID number and the date of collection. Additional information may be required by individual labs.
- Confidentiality should be maintained at all times.

- It is important to be certain that a tube is filled with the prescribed minimum volume in order to avoid spurious results due to an inappropriate anticoagulant to specimen ratio.

## Activity 10: Overview of clinical and laboratory presentations of opportunistic infections

- At CD4 counts >500 (WHO stage 1), symptoms are rare with the exception of persistent generalized lymphadenopathy (PGL), although recurrent upper respiratory infections and minor skin conditions can be present.
- As CD4 counts begin to decline to <500 (WHO stage 2), other symptoms begin to occur, including worsening skin conditions, herpes zoster (non-disseminated), and increased upper respiratory infections and vaginal candidiasis. Kaposi's sarcoma begins to be seen
- As CD4 counts decline below 500 (but above 200), more persistent symptoms begin, including mild weight loss, oral candidiasis (thrush), increasing risk of pulmonary TB, and more severe bacterial infections (pneumonia, pyomyositis).
- Once CD4 counts drop to below 200 (WHO clinical stage 4), symptoms are generally persistent and more severe and include a wide range of conditions.

## Activity 11: Nursing management strategies for opportunistic infections in adults and children

Basic nursing care for the HIV-infected adults with an opportunistic infection includes:

- Oesophageal Candidiasis which could present as oral plaques erythematous mucosa, odynophagia, dysphagia, irritability, retrosternal pain and fever. Treatment include use of Gentian violet 1%; Nystatin; Clotrimazole; Fluconazole; prophylactic regimens and use of local control measures
- Wasting Syndrome which presents as unintended and progressive weight loss, weakness, nutritional deficiency, diarrhea and fever. This could be managed by treatment of opportunistic infections, increase caloric intake, add carbohydrates and fats to diet, increase protein assess the need for oral as against enteral feeding and ensure intake of antiretroviral therapy
- Tuberculosis which could be diagnosed by prolonged fever, night sweats, cachexia, hepatosplenomegaly, diarrhoea and abdominal pain. Diagnosis is by positive blood culture of acid fast bacilli. Infection should be suspected in immuno-compromised patients with prolonged fever and weight loss. Treatment involves the combination drug regimen to prevent resistance such as Oral clarithromycin, 7.5 mg/kg twice a day or azithromycin 20 mg/kg daily, PLUS Ethambutol 5 mg/kg daily +/- Rifabutin 300 mg/day. Treatment continues for life. Most patients require 2-8 weeks of treatment before resolution of symptoms.
- Prophylaxis is recommended in patients with CD4 count < 50 cells/$mm^3$. This is in form of Azithromycin 30 mg/kg weekly or Clarithromycin 7.5 mg/kg twice a day. Can stop prophylaxis if CD4 count > 100 cells/$mm^3$ for 3-6 months

### Basic nursing care for the HIV-infected child with an opportunistic infection includes:

- Infection control: Maintain good hygiene. Always wash hands before and after care. Make sure linen nappies and other supplies are well washed with soap and water. Burn

rubbish or dispose of in containers. Avoid contact with blood and other body fluids and wash hands immediately after handling soiled articles.

- Skin problems: Wash open sores with soap and water, and keep the area dry. Salty water can be used for cleansing. Use medical treatment, such as prescribed ointment or salve, where available. Local remedies, oils, and calamine lotion might also be helpful.
- Sore mouth and throat: Rinse the child's mouth with warm water at least three times daily. Give soft foods that are not too spicy.
- Fevers and pain: Rinse body in cool water with a clean cloth or wipe skin with wet cloths. Encourage the child to drink more fluids (water, tea, broth, or juice) than usual. Remove thick clothing or too many blankets. Use antipyretics and analgesics such as aspirin, paracetamol, acetaminophen, etc.
- Cough: Lift the child's head and upper body on pillows to facilitate breathing, or assist the child to sit up. Place the child where she/he can get fresh air. Vapourisers, humidifiers can provide symptomatic relief.
- Diarrhoea: Treat diarrhoea immediately to avoid dehydration, using either oral rehydration salts (ORS), or intravenous therapy in severe cases of dehydration. Ensure that the child drinks more than usual, and continues to take easily digestible nourishment. Cleanse the anus and buttocks after each bowel movement with warm soap and water and keep the skin dry and clean. Antibiotics used for other infections can worsen the diarrhoea. Remember to wear gloves or other protective covering when handling faecally contaminated material.
- Local Remedies: There are often local remedies that alleviate fevers, pains, coughs, and cleanse sores and abscesses. These local remedies can be very helpful in relieving many of the symptoms associated with opportunistic infections. You may find compilations of information on local remedies which alleviate symptoms and discomfort.

### Assessing the family's ability to care for a child with HIV and HIV-related illness

- The ability of a family to care for a child with HIV-infection or related illness is affected by their socio-economic status and their knowledge and attitudes about HIV infection. The following questions will help the health care worker to determine what care can be expected from family members and what care must be obtained from other sources.
    - What does the family know about HIV infection? Do they know how HIV is transmitted and how to prevent transmission?
    - Can the family acknowledge that the child is HIV-infected, in order to access appropriate services?
    - What is the parents' state of health, including their emotional condition? Are they physically able to care for the child?
    - Which individuals can offer support to this family? What is their state of health?
    - Are they able and willing to help care for the child?
    - What is the social service system like to support this family?
    - What is the family's economic situation?
    - What is the condition of their living space?
    - What does the child eat? Is there a food shortage? Is clean drinking water freely available?

## Activity 12: Group work

Group presentation on hypothetical cases, Film show, Group counselling

# Module 11
# Theme: Nutrition and HIV/AIDS

## Goal
Participants will appreciate the importance of nutrition in the management of HIV/AIDS.

## Objectives
1. To revise basic nutrition and the benefits of adequate balanced nutrition.
2. Understand relationship between nutrition and HIV/AIDS
3. Understand the clinical contexts of nutritional status as it affects disease progression.
4. Discuss nutritional/dietary management of HIV related complication/opportunistic infections
5. Understand nutritional care of pregnant & lactating woman with HIV/AIDS
6. Discuss food and water safety for PLWHA
7. Describe nutrition and drugs interactions.

## Content
- Review basic nutrition
- Relationship between nutrition and HIV/AIDS
- Nutritional assessment for PLWHA
- Macronutrients and micronutrients needs of PLWHA
- Nutritional management of various symptoms associated with HIV/AIDS.
- Nutritional needs for pregnant and lactating mothers
- Food safety and hygiene (handling & storage)
- Management of food and nutrition interaction with drugs including ARVs

## Methodology
- Lectures/discussion
- Demonstration
- Graphic illustration

## Material needed
- Overhead projector
- Data/Multi-media projector
- Transparencies
- Flip-chart & flip-chart stand
- Markers (coloured)
- Masking tape
- Lap top
- Diskettes/other media storage devices

## Activity 1: Review knowledge of basic nutrition

This activity will focus on explaining the 6 classes of foods and their relevance in HIV/AIDS care and support programme. It will emphasize the need for adequate diet and eating positively to maintain body weight and improve health.

*Time: 10 minutes*

## Activity 2: Relationship between nutrition and HIV/AIDS

Participants will come to appreciate the role of nutritional deficiency in HIV pathogenesis. They will also comprehend the relationship between nutrition and disease progression.

*Time: 20 minutes*

## Activity 3: Nutritional Management of HIV/AIDS

The activity will focus on outlining how to provide first line care for HIV related infections and their symptoms. Participants will understand how to do a nutritional assessment for PLWHA as a pre-requisite for nutritional counselling. Participants should be conversant with appropriate nutritional supplement available for PLWHA.

*Time: 30 minutes*

## Activity 4: Nutritional counselling in HIV/AIDS

Training will be provided on how to provide nutritional counselling for pregnant and lactating HIV sero-positive mothers. The session will focus on training participants to be able to provide counselling on food and water safety measures for PLWHA.

*Time: 30 minutes*

## Activity 5: Food and drug interactions

Participants should understand interactions between ARV drugs and certain food/nutrients.

*Time: 20 minutes*

## Activity 6: Group work

# Lecture/Facilitator's notes

**Introduction**

Introduce participants to the objectives of the module. Inform participants that at the end of each session/activity, participants would be allowed to ask one or two questions to help clarify issues before the next session starts. Introduce the (resource person) for the session

*5 minutes*

## Activity 1: Review knowledge of Basic nutrition

- All the body building nutrients namely carbohydrates, protein, fats and oil, minerals, trace elements, vitamins, and water are needed by PLWHA.
- However, a lot of emphasis should be placed on high protein diet so that the ability to fight infection is improved.
- Proteins help in the building of the immune system, which helps all individuals to cope with infection including opportunistic infections. Since the virus attacks the immune system, the diet, which should include a lot of protein, help with the building up and renewal of the destroyed cells.
- Some minerals like selenium, zinc and vitamins like vitamin A and E taken as supplements also help to stabilize the cells thus preventing the virus from entering the immune cells.
- The diet of a client should therefore be planned to contain all these essential nutrients.
- Issues involved in planning client's diet include:
    - Availability
    - Affordability
    - Tolerance
    - Timing
    - Quantity

- Nutrition plays a critical role in comprehensive care and support for people living with HIV/AIDS.
- Nutritional interventions can help manage symptoms, promote response to medical treatment, slow progression of the disease, and increase the quality of life by improving daily functioning.

## Activity 2: Relationship between nutrition and HIV/AIDS

- Malnutrition and HIV negatively affect each other.
- HIV infection may result in poor nutrition as a result of insufficient dietary intake, mal-absorption, and altered metabolism.
    - This cycle has the following results:
    - Weight loss, the most common and often disturbing symptom of HIV, reported in 95% to 100% of all patients with advanced disease
    - Loss of muscle tissue and body fat
    - Vitamin and mineral deficiencies

- Reduced immune function and competence
- Increased susceptibility to secondary infections
- Increased nutritional needs because of reduced food intake and increased loss of nutrients leading to rapid HIV disease progression

- Malnutrition and HIV affect the body in similar ways. Both conditions affect the capacity of the immune system to fight infection and keep the body healthy.
- The following changes in the immune function resulting from malnutrition are similar to those caused by HIV and AIDS:
  - Reduced CD4 cell count
  - Increased CD8 cell count
  - Delayed cutaneous hypersensitivity
  - Reversed CD4/CD8 ratio
  - Reduce serologic response after immunizations
  - Delayed bacteria killing

- HIV affects nutrition in three sometimes overlapping ways:
  - It is associated with symptoms that cause a reduction in the amount of food consumed
  - It interferes with the digestion and absorption of nutrients consumed
  - It changes metabolism, or the way the body transports, uses, stores, and excretes many of the nutrients

## Decreased food consumption

- HIV/AIDS is associated with conditions that result in reduced food intake. Decreased food consumption may result from the following factors:
  - Inability to eat or swallow because of painful sores in the mouth and throat
  - Loss of appetite as a result of fatigue, depression, and other changes in the mental state
  - Side effects of medications, including nausea, loss of appetite, a metallic taste in the mouth, diarrhoea, vomiting, and abdominal cramps
  - Reduced quantity and quality of food in the household as a result of the inability to work or reduced income because of HIV-related illness

## Nutrient and food absorption

- HIV infection also interferes with the body's ability to absorb nutrients, an effect that occurs with many infections.
- Poor absorption of fats and carbohydrates can occur at any stage of HIV infection in both adults and children and results in excess nutrient loss.
- Poor absorption is caused by the following:
  - HIV infection of the intestinal cells, which may damage the gut, even in people with no other symptoms of infection
  - Increased incidence of opportunistic infections such as diarrhoea, which is a common cause of weight loss in people living with HIV
  - Poor absorption of fat reduces the absorption and use of fat-soluble vitamins such as vitamins A and E. This can further compromise nutrition and immune status.

## Changes in metabolism

- Changes in metabolism in HIV-infected people occur as a result of the immune system's response to HIV infection. When the body mounts its acute phase response to infection, it releases pro-oxidant cytokines and other oxygen-reactive species.
- These cytokines produce several results, including anorexia (causing lower intake of food) and fever (increasing energy requirements).
- If the infection is prolonged, muscle wasting occurs because muscle tissue is broken down to provide the amino acids with the immune protein and enzymes they need.
- These processes increase energy requirements of people living with HIV/AIDS during the asymptomatic phase by 10% over the level of energy intake recommended for healthy, non-HIV-infected people of the same age, sex, and physical activity level.
- They increase energy requirements during the symptomatic phase by 20-30% over the level of energy intake recommended for healthy, non-HIV-infected people of the same age, sex, and physical activity level
- The body also responds to this release of pro-oxidant cytokines by increasing the demand for antioxidant vitamins and minerals, such as vitamins E and C, betacarotene, zinc, and selenium.
- These vitamins and minerals are used to form antioxidant enzymes.
- Oxidative stress occurs in an imbalance between the pro-oxidants and antioxidants, when there are not enough antioxidants to meet the demands of the pro-oxidant cytokines. This stress is believed to increase HIV replication and transcription, leading to higher viral loads and disease progression.
- Nutrition also alters the HIV incidence, severity and duration inversely

## HIV/AIDS-associated wasting syndrome

- Wasting syndrome is a multifaceted complication of HIV that is well known to increase morbidity and mortality.
- Both body weight and body cell mass assays should be used to assess body composition to understand the clinical significance and magnitude of the wasting syndrome in HIV.
- Body cell mass is the metabolically active tissue compartment in the body. It measures are superior to body weight measures in the presence of HIV because they correlate better with mortality. With the progression of HIV disease there is:
    - A progressive depletion of body cell mass in the late stages of HIV disease
    - Significant prolonged survival in patients with body cell mass of > 30 percent of body weight or serum albumin levels exceeding 3.0g/dl

- There may be many causes of AIDS-wasting syndrome. The etiology should define the management of the condition. The following factors may be associated with the syndrome:
    - Reduced energy intake
    - Gastrointestinal disorders including diarrhoea and mal-absorption
    - Metabolic parameters

## Changes in body composition

- When a healthy person suffers an acute illness that reduces food intake, inadequate levels of nutrients are ingested and absorbed by the body to meet increased energy needs. As a result, weight (fat mass) may be lost first but is usually regained immediately after normal eating habits return. Fats stored in adipose tissues are

catabolized to fuel the body energy needs, thus sparing amino acids needed to build or preserve lean body mass.

- With HIV/AIDS, however, the opposite seems to occur. Amino acids are more readily used to fuel energy needs, while fat continues to accrue. The patient may consume adequate nutrient levels but utilizes and stores them inadequately. The patient has excess adipose tissue in proportion to lean tissue as the body converts the digested nutrients into fat instead of lean tissue. With high triglyceride levels in the blood, resting energy expenditure is increased.
- The underlying causes of an HIV-infected person's inability to preserve or regain lean tissue remain unknown.

## Activity 3: Nutritional Management of HIV/AIDS

### A. Nutritional assessment of PLWHA

- The nutritional assessment is important to gather information on the nutritional status and adequacy of the diet and to identify risk factors for developing nutritional complications.
- The earlier this assessment can be done the better.
- The information gathered should be interpreted to identify problems that put the individual at high nutrition risk or contribute to the malnutrition.
- The nutritional assessment should help counsel the PLWHA diet to ensure adequate weight gain, improve eating habits, and identify and address food insecurity issues.
- The goal of the nutritional assessment and interventions are to improve nutritional status, enhance quality of life, and prolong survival of the individual

### Components of a nutritional assessment

- Nutritional assessments include the following:
  - **Nutrition history**
    - Dietary intake and adequacy
    - Eating habits
    - Food intolerance and aversions to related symptoms
    - Dietary problems (e.g., poor appetite, difficulty chewing and swallowing, gastrointestinal problems, and pain in the mouth and gums)
    - Hygiene and food preparation and handling practices
    - Psychosocial factors contributing to inadequacy of intake, such as social isolation, depression, stigma, and inability to prepare food
    - Fatigue
    - Physical activity
    - Knowledge of food and nutrition issues
    - Use of vitamin and mineral supplements and alternative practices

  - **Physical assessment**
    - Anthropometric measurements
    - Height, pre-diagnosis weight, weight gain following counselling
    - Measurement of mid-upper-arm circumference (MUAC) for evidence of loss of muscle mass; **less than 23 cm indicates nutrition risk**
    - Screening for oral or pharyngeal inflammation or pain
    - Screening for pallor (inner eyelids and palms)

- **Medical history**
  - Gastrointestinal problems (e.g., diarrhoea, abdominal pain, nausea, vomiting)
  - Pattern of bowel movements (constipation or diarrhoea)
  - Presence of opportunistic infection
  - Concurrent medical problems (e.g., diabetes, hypertension, malaria)

- **Medication profile**
  - Drug use (ARVs, alternative therapies, and other medications)
  - Side effects of medications with nutritional implications
  - Nutrition-medication interactions
  - Traditional herbs or medicine interactions

- **Biochemical data** (laboratory data where available and feasible)
  - Serum albumin
  - CD4 and viral load counts
  - Evaluation of anaemia: Iron (Hb), vitamin B12, and folate status

- **Psychosocial profile**
  - Living environment and functional status
  - Income, housing, amenities for cooking, access to food, attitude towards nutrition and food preparation, age, family or support system, and educational level

## Practical considerations for nutrition interventions

- Encourage individual to eat a varied diet with extra food and get additional rest. However, all interventions should be based on the individual nutritional assessment.
- Conduct nutritional assessments for individuals with weight gain below the recommended range. This may indicate a possible medical problem (e.g., an opportunistic infection), inappropriate energy intake, or food insecurity. Identify and implement appropriate interventions.
- Monitor weight gain during counselling sessions.
- Be aware of community services and programs (e.g., food distribution programs) that may benefit nutritionally vulnerable PLWHA especially women. Establish links and refer women who need these services.
- Assess the PLWHA for other risk factors that can affect nutritional status. These factors include adolescence, previously existing malnutrition, underweight status at the start nutritional therapy, anaemia, gestational diabetes, and opportunistic infection.
- Discuss with the individual dietary management and appropriate interventions of
- diarrhoea, nausea, vomiting, mal-absorption, loss of appetite, oral thrush, and opportunistic infections. These conditions may prevent weight gain in the PLWHA and have a profound impact on nutritional status and disease progression
- Be aware of cultural foods, traditional therapies, and practices that are harmful and counsel the individual about them.
- Counsel the PLWHA on foods to avoid, especially foods that expose them to bacterial or enteric infection, which can hasten disease progression. These foods include raw eggs or foods with little nutritional value or that do not improve nutritional status. For

example, coffee and alcohol decrease appetite, interfere with metabolism, and in the case of alcohol, may interact with some medications to decrease their efficacy.

- Note the medications, including ARVs, that the PLWHA is taking and be aware of the food and drug interactions that can have a negative impact on the woman's nutritional status by reducing food intake. Provide appropriate interventions as required.
- Improving micronutrient status is an important step to decrease malnutrition, Provide multivitamins and other vitamin or mineral supplements as per the country guidelines or
- WHO/UNICEF guidelines for all PLWHA and HIV positive pregnant women. Stress the use of iodized salt to prevent iodine deficiency.
- If multivitamins are recommended to improve the adequacy of the diet or the nutritional status, carefully analyze their composition. High doses of many nutrients (more than **10 times** the usual recommended dietary allowance) may harm the immune system rather than benefit. For example, vitamin C in excess of 1,000 mg may cause or exacerbate diarrhoea.
- The counsellor should also work with the client to help identify options to address drug and food interactions and enable effective use of drugs with minimal nutritional side effects.
- This process should involve awareness of food security or other constraints, feasible food-drug options within the constraints, and options to address or reduce the constraints. The option selected will depend on the drugs used, their specific food and nutrition implications, and the client's circumstances.
- The counsellor should give clients detailed information on the chosen options and alert them to pay close attention to any dietary changes resulting from side effects.
- The counsellor should meet the client regularly to follow up on implementation of the chosen option. The follow-up sessions will not assess the impact of nutritional management but rather the client's success in implementing the choice and determining the main constraints to help identify other feasible options.

If clients are having trouble accessing the required food, the counsellor may refer them to other available services to improve food access.

The nutritional needs of HIV-infected people and the effects of HIV infection on their nutritional status may vary according to the stage in the disease.

## I. Acute phase

- ***Initial infection.***
  - As soon as HIV enters the body, it replicates rapidly. This rapid replication requires energy and nutrients taken from the host's body.
  - The virus relies entirely on the host for survival and will deplete the host of whatever is required for its multiplication and survival.
  - The HIV infection may have a rapid onset leading to hypermetabolism with catabolism. Although some infected people may not have any symptoms at this stage, the host's energy and nutrient needs increase, and food intake should increase accordingly. If the host's food does not increase, there will be a nutrient negative balance.
  - The period during which this occurs varies from 1 to 6 weeks, depending on the person.

- ***Seroconversion***
  - During the sero-conversion phase, the body produces antibodies to fight the virus.
  - The body needs additional energy and nutrients to mount this immune response.
  - If these are not provided by the diet, the host will use fat and muscle to provide the necessary nutrients.
  - The host will lose weight and will gradually develop malnutrition that will weaken the immune system and make the host vulnerable to opportunistic infections.
  - The sero-conversion phase occurs after 6– 12 weeks.

## II. Asymptomatic phase

- The length of the asymptomatic phase varies and may last several years, depending on the host's health and nutritional status before the infection.
- The asymptomatic phase is marked by hypermetabolism and increased energy needs.

## III. Symptomatic phase

- Initial symptoms are marked by the onset of opportunistic infections.
- Common symptoms include fever, night sweats, tuberculosis, fungal infection of the mouth, chronic diarrhoea, and weight loss.
- The onset of opportunistic infections is a sign of a weakened immune system. Negative nitrogen balance occurs early in acute infections because of the decrease in food intake and increased urinary protein losses.
- Immunologic response to infection activates cytokines, which causes fever and anorexia, thereby leading to increased energy expenditure and decreased caloric intake.
- The opportunistic infections further increase the nutritional needs of the host and continue to weaken the immune system and hasten the progression of the disease.
- The persistence of symptoms and opportunistic infections lead to increased energy, and nutrient needs, reduced food intake, mal-absorption of nutrients, weight loss, and wasting.
- Wasting is defined as a profound involuntary weight loss > 10 percent of baseline body weight plus either chronic diarrhoea (> 30 days) or chronic weakness and documented fever (> 30 days) in the absence of a concurrence illness or condition other than HIV infection.
- Wasting is often accompanied by changes in lean body mass and body cell mass.
- The persistence of reduced food intake, mal-absorption of nutrients, weight loss, and wasting will lead to AIDS.

## IV. Late symptomatic phase (AIDS)

- The late phase is marked by metabolic alteration, weight loss, and wasting.
- Other characteristics include high viral load, decreased CD4 count, pneumonia, Kaposi's sarcoma, systemic fungal infection, bacterial infection, and certain types of cancer.
- The stages and the symptoms described are indicative and may vary from one individual to another or overlap..
- Dietary management of HIV/AIDS-related symptoms has the following advantages:

- Enables greater food intake by adding more flavour, encouraging consumption of small but frequent quantities of food, or presenting foods in a texture that can be easily eaten
- Increases comfort and reduces pain while eating
- Provides more nutrients to compensate for nutrient losses
- Prevents dehydration during diarrhoea and fever
- Complements and strengthens medical treatment
- Reduces the severity of symptoms by providing specific nutrient needs and strengthening the immune system

➢ The dietary management of HIV/AIDS-related symptoms should be integrated in all services at health centres and in outreach activities where health workers and counsellors meet people living with HIV/AIDS.

## C. Nutritional supplements

➢ Without providing specific nutrition interventions, there is faster weight loss associated with HIV infection, faster disease progression, and shorter survival time.
➢ Low blood levels of several nutrients, including, selenium, iron, zinc, and vitamins A, B12, and E, are associated with faster HIV disease progression and reduced survival.
➢ Nutrition supplementation and counselling interventions reduce HIV patients' vulnerability to weight loss and muscle wasting. This effect is confirmed particularly when nutrition supplements are given in the early stages, when low dietary intake and poor nutrient absorption are the primary causes of weight loss.
➢ Later in the course of infection, when metabolic changes begin to play a leading role in the wasting process, other types of interventions are required. This include:
➢ high energy/protein liquid supplements
➢ omega-3 fatty acids, which the body needs to respond to inflammation
➢ Supplement containing amino acids and several antioxidant vitamins and minerals which helps to increase in muscle mass.
➢ When single or multiple micronutrient supplements are given, these supplements improved the immune system, reduced oxidative stress, and reduced the risk of morbidity and mortality.
➢ Vitamin A supplementation is also shown to reduce diarrhoea and mortality and improved several indicators of immune status in HIV-infected children. However, the exact dosage for maximum effectiveness remains unknown.
➢ Improving vitamin B12 status improves CD4 cell counts.
➢ Vitamins E and C reduced oxidative stress and HIV viral load. However, taking vitamin E supplements in the late stage of the disease may not be effective because the vitamin is fat soluble and poorly absorbed.
➢ Multivitamin supplementation has also been shown to improve pregnancy-related outcomes and immune status.
➢ Selenium and beta-carotene supplements increase antioxidant enzyme functions
Zinc supplements reduced the incidence of opportunistic infections, stabilized weight, and improved CD4 counts. Some studies in the United States however, suggest that additional zinc intake is associated with faster HIV-disease progression.

## D. Recommended nutritional requirements for the HIV infected pregnant or lactating woman/adolescent

- A young maternal age (11-18 years) increases nutrient needs above the ordinary demands of pregnancy. This is as a result of the combined needs for adolescent growth and foetal growth and development.
- For the HIV-infected pregnant or lactating adolescent, nutrient requirements increase as a result of HIV infection. Thus the requirement for energy, protein, and other nutrients increases overall to ensure continued growth of the adolescent mother, growth and development of the foetus, and fulfilment of the increased demands on the body by HIV infection.
- The HIV-infected pregnant or lactating adolescent is at high risk of malnutrition and should be closely monitored.
- Improving nutrition prior to pregnancy should be the main goal to minimize the impact of HIV on nutrition.
- This is a challenge because many women and adolescent girls do not know they are HIV infected until the disease is advanced or until they choose to be tested for HIV at the antenatal clinic.

Early nutrition interventions can minimize the impact of HIV on the mothers' nutritional status and health.

- Similar to HIV, common secondary infections such as fever and diarrhoea increase energy and nutrient requirements.
- Fever, a common symptom in HIV-infected people, increases energy requirements by about 10% for every degree rise above normal body temperature.
- The energy and nutrient requirements imposed by a co-infection such as fever may need to be taken into account when assessing the nutritional requirements of someone infected with HIV, just as they would be for someone who is not HIV infected.
- HIV infection increases the energy requirements of a pregnant or lactating HIV infected woman, and fever increases them further.
- The current recommended increase in energy intake for HIV-infected pregnant and lactating women is the same as for non-pregnant, non-lactating HIV-infected women (10% during the asymptomatic phase and 20-30% during the symptomatic phase).
- The additional energy (10%) is added to the basic energy requirements for a non pregnant, non-lactating woman of the same age and physical activity level.
- For example, if a 25-year-old moderately active 55 kg woman requires 2,140 kcal daily, an asymptomatic HIV-infected moderately active pregnant woman of the same age and weight will require approximately 2,140 kcal + 214 kcal (10 percent increase due to HIV) + 285 kcal (due to pregnancy) = 2,639 kcal daily. If she is symptomatic (e.g., has fever), then she will require 20-30% additional energy (428 kcal-642 kcal).

### E. Micronutrient supplementation for pregnant and lactating women and adolescent girls

- Pregnant women and infants are the most vulnerable to iron deficiency.
- Anaemia during pregnancy is a risk factor for infant and probably maternal morbidity and mortality.
- Iron deficiency anaemia of up to 80% is found in some countries of sub-Saharan Africa.
- Because anaemia is so prevalent, iron and folic acid supplementation is recommended during pregnancy and lactation for 6 months in pregnancy. If started late, this supplementation should extend into the post-natal period for 6 months where the prevalence of anaemia is <40%. Where the prevalence is >40%, supplementation is recommended for 6 months in pregnancy and 3 months post-partum for a total of 9 months (WHO/BASICS/UNICEF 1999).

- Iron and folic acid supplements should be provided to HIV-infected pregnant women as per existing national standards for antenatal care for all pregnant women.
- Anaemia is common during HIV infection, and in the HIV-infected mother anaemia increases the risk of mortality.
- The causes of anaemia in HIV infection are complex. In developing countries anaemia in pregnant or lactating women may be a result of poor dietary intake, poor absorption of iron or other vitamins such as folate and vitamin B12, and co-infections such as malaria and hookworm. For the HIV infected pregnant woman, prolonged use of some antiretroviral drugs (ARVs), such as AZT (Zidovudine), can cause anaemia that presents as megaloblastic anaemia like that seen with folate or vitamin B12 deficiency.
- In many developing countries iron supplementation during pregnancy and lactation is recommended.
- Excessive amounts of iron may contribute to HIV disease progression. However, available data did not contraindicate the current practice of iron supplementation in developing countries with a high prevalence of both iron deficiency anaemia and HIV. Therefore, pregnant women should receive iron supplementation to prevent anaemia as per the standard of care for pregnant women in the country, pending further review of the issue.
- The pregnant adolescent girl has an increased need for iron, folic acid, and zinc. A multivitamin supplement, where available, can help meet these increased needs.
- The use of high levels of supplements (usually **greater than 10 times** the recommended daily allowance) is not recommended because it can lead to nutrient toxicity that can be harmful to the body.
- Nutrients that may become toxic if taken in large amounts include iron, zinc, selenium, and vitamins A, B, C and D.
- For the HIV-infected pregnant or lactating woman, a high intake of these nutrients could do more harm. For example, studies have shown that high intakes of iron may contribute to HIV-disease progression and that for the lactating HIV-infected mother, vitamin A supplementation may increase the risk of HIV-1 transmission

## Activity 4: Nutritional counselling in HIV/AIDS

### A. Goals of nutritional care and support for the HIV-infected pregnant or lactating woman or adolescent girl

- Improve nutritional status. Maintain weight, prevent weight loss, and preserve lean body mass.
- Ensure adequate weight gain during pregnancy. A pregnant woman should gain at least 1 kg per month during the second and third trimesters.
- Ensure adequate nutrient intake by improving eating habits and building stores of essential nutrients (both macronutrients and micronutrients). These nutrients include carbohydrates, protein, important antioxidant nutrients, and other vitamins and minerals necessary for the functioning of the immune system.
- Prevent food-borne illnesses by promoting hygiene and food and water safety.
- Enhance the quality of life by promptly treating infections and managing the symptoms that affect food intake to minimize the impact of secondary infections on nutritional status.
- Provide palliative care as necessary during advanced stages of the disease.

## B. Nutrition education and counselling

- Nutrition education and counselling should be an integral part of nutritional care and support of the HIV-infected pregnant or lactating woman or adolescent.
- Nutrition education and counselling are important to help the mother understand the need to maintain an adequate diet and how to manage common gastrointestinal problems related to HIV and pregnancy that may have a negative impact on nutritional intake.
- Counselling on the dietary management of common symptoms that affect intake is essential to ensure continued adequate energy and nutrients to maintain lean body mass, ensure optimal gestational weight gain during pregnancy, and delay disease progression.
- In addition, counselling and education should address vitamin and mineral supplementation (particularly iron and folate supplementation) during pregnancy, malaria and hookworm treatment as required, and adequate diet to support lactation and prevent weight loss.
- Group educational talks can address topics of concern to most women, leaving time in individual sessions for evaluation and counselling.
- Topics for group talks may include food safety, importance of fluids and hydration during lactation, and locally available nutrient-dense food choices.
- Antenatal clinics and women's support groups are settings where group educational talks could be beneficial.

## C. Nutrition counselling in the context of HIV/AIDS

- Many people think counselling is giving information and advice. But counselling an HIV-infected pregnant woman or adolescent girl may involve more than imparting information and advice on diet, nutrition, and healthy eating.
- The counsellor may also help the mother address her feelings about and reactions to being HIV infected.
- A counsellor who understands how clients react to HIV infection can provide nutrition counselling to help them examine their options and make the best choices.
- In this way the clients are more likely to comply with the nutrition information and advice. An effective counsellor must:
    - Build a trusting relationship with the client
    - Maintain professionalism and confidentiality at all times
    - Treat the client with respect and acceptance (avoid being judgmental)
    - Respect the client even if the counsellor does not agree with the client's attitudes, beliefs, and life choices
- Nutrition counselling and education to prevent malnutrition during pregnancy and lactation and improve reproductive health and birth outcomes can benefit all pregnant and lactating women, regardless of their HIV status.

## D. HIV and infant feeding risk analysis

- Maternal viral load: Maternal viral load is higher in mothers with recent HIV infection or advanced disease. The risk of MTCT during breastfeeding nearly doubles if the mother becomes infected while breastfeeding. For mothers who became infected post-natally, there is a 29% risk of transmission through breastfeeding.

- Maternal immune status: Maternal immune status also appears to increase the risk of transmission. Immune deficiencies in the mother, including a low CD4 or high CD8 cell count, increase the risk.
- Breast health: Breast health related to mastitis, cracked and bloody nipples, and other indications of breast inflammation may affect transmission of HIV. The risk is also higher in an infant with oral lesions such as thrush. Mastitis may be caused by infectious agents, poor positioning and attachment, or weak suckling. Deficiencies in the antioxidants vitamin E and selenium also may increase the risk of mastitis. Mastitis causes junctions in the mammary epithelium to become "leaky," allowing blood plasma constituents (HIV) to enter breast milk. Cytokines and other immune reactions resulting from mastitis can damage the intestines of young babies.
- Pattern or mode of breastfeeding: The pattern or mode of breastfeeding also affects transmission. Babies who are exclusively breastfed may have a lower risk of becoming infected than those who consume other liquids, milks, or solid foods in addition to breast milk during the first months of life. At 3 months, infants who were exclusively breastfed had significantly lower transmission rates (19.4%) than mixed-fed infants (26.1%) and the same transmission rate as formula-fed infants (19.4%). There is however limited evidence to support this.
- Mucosal integrity: Studies show that the disruption of the epithelial integrity of the mucous membranes of the intestine or mouth of the infant increases the risk of transmission. Mixed feeding, allergic reactions to complementary foods, and infectious illness can damage the intestine and increase risk of transmission. Oral thrush in an infant may also be associated with MTCT.
- Breastfeeding duration: The first positive PCR cannot differentiate whether transmission occurred during late pregnancy, labour and delivery, or the early post-natal period. Studies suggest that the risk of transmission declines with the age of the infant. It is difficult, however, to ascribe increased risk only to breastfeeding duration and the age factor, as feeding patterns change over time. Breast milk intake is gradually decreased, which reduces exposure to the virus but also causes the infant to become increasingly vulnerable to other infections.
- Maternal nutritional status: Malnutrition during pregnancy *may* increase the risk of MTCT. Vitamin A deficiency may impair T and B cell function, resulting in an increased maternal viral load and reduced antibody concentrations. Vitamin A deficiency could also result from advanced HIV disease. Both malnutrition and vitamin A deficiency contribute to MTCT. Taking multivitamins, not vitamin A, significantly increased CD4, CD8, and
- CD3 counts. No conclusions were drawn from the findings on vertical transmission.

## Safer infant feeding options

- Once a thorough assessment has been made of the mother, household, and community, the infant feeding options below may be discussed and evaluated for their feasibility and practicality.
- Food security issues must be considered for each of the options.
- It should be emphasized that none of the following options are easy for the mother to practice without support, especially is she is HIV infected.

## Modified exclusive breastfeeding

- ***Exclusive breastfeeding***: of infants up to 6 months should be promoted for women who are HIV negative or of unknown HIV status. Exclusive breastfeeding should also be supported as long as replacement feeding is not a viable option for an HIV

infected mother. UN guidelines state that breastfeeding should be promoted, protected, and supported for all women who do not know their HIV status and for women who are not infected. Notes should be taken in addressing the policies that support exclusive breastfeeding or breastfeeding in general in Nigeria. For the mother on HAART for purposes of PMTCT, she should continue through the duration of breastfeeding.

- ***Early cessation of breastfeeding****:* is recommended for a maximum period of six months for HIV-infected mothers when adequate and hygienic replacement feeds are available. Cessation is especially important if a mother develops AIDS symptoms. A study showed the declining protection afforded by breast milk with age of infant. A number of factors should be considered to support a mother in the early cessation of breastfeeding. As discussed below, acceptable, feasible, sustainable, and safe breast milk substitutes must be available. Appropriate complementary foods and feeding practices must also be encouraged, and food security considerations taken into account. Recommend a transition period between exclusive breastfeeding and exclusive replacement feeding with the following actions to accustom the infant to the new feeding patterns.
    - Accustoming the infant to cup feeding
    - Providing skin-to-skin contact and use of massage and other means to comfort the baby in place of offering the breast
    - Teaching the infant to sleep through the night
    - Monitoring the infant's urine output to detect and prevent dehydration
    - Switching from breast milk to replacement foods
    - Supporting and caring for the mother

➢ ***Methods for treating expressed breast milk*** are currently being tested. Such methods include pasteurizing the milk (heating to 62.5 degrees Celsius for 30 minutes) or boiling it briefly and cooling it immediately in the refrigerator or by placing the container in cool water. Although these methods destroy HIV, they may be difficult to sustain. Heat-treated milk retains nutritional benefits but loses some anti-infective factors. Ideally, an infant should be given the treated breast milk from a cup. This option is most likely feasible in a hospital setting for sick and low birth weight infants. Several studies have shown that expressing breast milk and letting it stand for a half-hour inactivates HIV. During this time the naturally occurring anti-HIV factors in breast milk are allowed to take effect. Again, the feasibility and sustainability of this option must be considered. Does the mother have time (or well-being) to express and heat treat her milk, and then feed her child? With an electric pump in the optimal setting, expressing and storing takes on average 20-30 minutes, and the infant is fed this expressed breast milk 8-10 times a day. Can the mother afford the fuel to heat the breast milk?

➢ ***Exclusive replacement feeding***

- Replacement feeding refers to feeding a child who is not receiving any breast milk from birth to about 2 years of age with a diet that provides all the nutrients the child needs. The following conditions must be in place for safe replacement feeding:
    - Access to clean water
    - Availability of sterilized utensils

- A steady supply of commercial or home-prepared formula for meeting the infant's nutritional needs

- ***Replacement feeding options for children 0-6 months***
  - ***Commercial infant formula*** is made from modified cow's milk or soy protein but lacks the long-chain essential fatty acids that are present in breast milk. Giving formula requires water, fuel, utensils, skills, and time to prepare it accurately and hygienically. The average quantity needed to feed an infant for 6 months is 20 kg of powdered formula (44 tins containing 450g each). Cup feeding rather than bottle feeding is recommended for hygienic purposes.
  - ***Home-prepared formulas*** can be made from animal milks, powdered milk, and evaporated milk. Animal milks (e.g., cow, goat, buffalo, or sheep). For modified cow's milk use 100 ml cow's milk; 50 ml of boiled water; and 10g of sugar (2 teaspoons). Home prepared formulas are usually deficient in micronutrients such as iron, zinc, folate, and vitamins A and C. Unmodified cow's milk increases the risk of dehydration because of greater concentration of sodium, phosphorous, and other salts. Again, cup feeding is recommended for hygienic purposes. Powdered full-cream milk and evaporated milk. Full-cream milk requires the addition of boiled water as described on the package. Increase water by 50 percent and add 10g of sugar for each 150ml of feed. Micronutrients are also required. Skimmed milk, sweetened condensed milk, cereal feeds, juices, and teas are not suitable for replacement feeds before 6 months. Again, cup feeding is recommended for hygienic purposes.

➢ ***Recommendations for replacement feeding of children 6-24 months***

- Children of this age should be given a suitable breast milk substitute and complementary foods (nutrient enriched and appropriately prepared family foods).
- Between 6 and 12 months breast milk generally provides up to half or more of an infant's nutritional requirements, and between 12 and 24 months, up to one-third of requirements.
- If suitable breast milk substitutes are not available, other dairy products should be given, such as animal milk, dried skimmed milk, yogurt, meat, liver, fish as a source of iron and zinc, and fruits and vegetables to provide vitamins (especially A and C).
- The guidelines for complementary feeding of children ages 6-24 months should be carefully adhered to for children given replacement feeds.
- Food quantity, consistency, and variety should increase as the child ages, while maintaining frequent replacement feeds.
- Feeding frequency should also increase as the child ages, using a combination of meals and snacks.
- Children 6-8 months old should receive complementary foods 2-3 times a day, children 9-11 months old should receive complementary foods 3-4 times a day, and children 12-24 months old should receive complementary foods 4-5 times a day.

- It is also important to diversify the diet to improve quality and micronutrient intake.
- The mother or caregiver should practice responsive feeding, frequent and responsive feeding during and after illness, and good hygiene and proper food handling.

➢ **Other breast milk options**

- Breast milk from breast milk banks is generally available over a short time for sick or low birth weight babies, but not in limited-resource settings.
- Wet nurses should be HIV negative. HIV transmission may occur from the infant to the wet nurse, especially if she has cracked nipples.

**ARV and breastfeeding**

➢ Safe alternatives may not be available in some resource-limited settings, (e.g., unsafe or inadequate water supply may be the only sources available for mixing formulas) in which case exclusive breastfeeding for the first six months of life is recommended
➢ Women who require ART and are breastfeeding should continue their ongoing ART regimen
➢ Efficacy of potent ART for mother, used solely to prevent postnatal transmission of HIV through breast milk is unknown, but is currently being studied
➢ HAART has been shown to dramatically reduce the transmission of HIV to the infant

### E. Food and water safety

➢ Effective and inexpensive ways to deal with the cycle of infection and poor nutrition include good nutrition, hygiene, and food safety.
➢ Improper food handling can cause infection in anyone, but for people infected with HIV, food-borne illnesses can cause even more damage because their weakened immune systems increase their susceptibility to other infections.
➢ Therefore, a main goal of nutritional care and support for HIV-infected persons is to avoid food-borne illnesses by educating and counselling on hygiene.
➢ This can help prevent infections that cause diarrhoea, a common cause of HIV disease progression.
➢ Hygiene includes water and sanitation and proper food handling and safety.
➢ During the counselling and education session the counsellor should stress safe food handling practices to avoid food-borne illnesses.

## Activity 5: Food and drug interactions

➢ As described in previous sessions, people living with HIV/AIDS risk malnutrition because of mal-absorption, reduced food intake, and increased loss of nutrients as a result of infections and viral replication.
➢ People living with HIV/AIDS use medications to treat HIV/AIDS, opportunistic infections caused by HIV/AIDS, and the common diseases such as waterborne diseases, malaria, tuberculosis, and intestinal parasites.
➢ Effective medical treatment can slow the progress of HIV, reduce opportunistic infections, and ease symptoms, but food can interact with drugs and affect the drugs' efficacy.
➢ Drugs can also interact with foods and nutrients and negatively affect nutritional status. The side effects of both traditional and modern medications can affect both food intake and nutrient absorption and thereby the client's adherence to medications.
➢ Additionally, drugs and food can interact to cause unhealthy side effects.

- Ultimately, if not addressed, drug and food interactions can result in poorer health and nutritional status.

## Rationale for the proper nutritional management of drug and food interactions in HIV/AIDS therapy

- The food and nutritional implications of modern and traditional therapies need to be properly addressed to prevent weight loss, wasting, and malnutrition.
- Proper management of drug and food interactions will also ensure the efficacy of the therapies.
- Side effects that interfere with food consumption or interactions that limit food intake or reduce nutrient absorption may also lead to poor medication adherence.
- This may result in clients discontinuing medications before completing the necessary course, which for antiretroviral drugs (ARVs) may last many years.
- Proper nutritional management of the side effects will help minimize them and improve the client's adherence to the treatment.
- **Food and drug interactions and their dietary management**
  - The main food and drug (modern and traditional medications) interactions are listed below
    - Food effects on drug efficacy
    - Drug effects on nutrient absorption, metabolism, distribution, and excretion
    - Side effects of medications that affect food intake and nutrient absorption
    - Drug and food interactions that cause unhealthy side effects.
  - The side effects of drugs on food intake and the effects of drugs on nutrient absorption, metabolism, distribution and excretion may have the most negative impact on the nutritional status of people living with HIV/AIDS.
  - The side effects of drugs and the effects of the disease are often difficult to distinguish. For example, headaches, malaise, fever, and gastrointestinal symptoms may be side effects of drugs but can also be associated with HIV and AIDS. Appropriate dietary responses may help address these.
  - Moreover, the effects of food on drugs' efficacy and the unhealthy side effects caused by the interaction of food and drugs also require appropriate dietary responses to maintain nutritional status and ensure the client's adherence and the effectiveness of the treatment.
- **Food effects on drug efficacy**
  - Food intake or meals can enhance or inhibit the absorption, metabolism, distribution, and excretion of medications. This type of interaction varies from one drug to another and requires appropriate dietary responses to improve the client's adherence and optimize the medication's efficacy.
  - Dietary management to improve the efficacy of a medication includes taking the medication with food, on an empty stomach, or with or without certain types of foods.

  Examples of the ways food intake affects drug efficacy are listed below.
    - Food reduces the rate of absorption of aspirin (acetylsalicylic acid), commonly used to treat the fever and pain that are common in people living with HIV/AIDS. Aspirin is best taken 2 hours after meals with a full glass of water.
    - Food reduces the absorption of Isoniazid, a medication commonly used to treat tuberculosis. Therefore, Isoniazid has to be taken 1 hour before or 2 hours after meals.

- Rifampin is also used to treat tuberculosis. As with Isoniazid, food reduces the absorption of Rifampin. Rifampin should be taken 1 or 2 hours after meals to increase the medication's absorption.
- Food enhances the absorption or metabolism of some ARVs and inhibits the absorption or metabolism of others. For example, a high-fat meal increases the bioavailability of the nucleoside analogue Tenofovir. A high-calorie, high-fat, high-protein meal decreases absorption of the protease inhibitor Indinavir and reduces the absorption of the nucleoside reverse transcriptase inhibitor Zidovudine. It is therefore recommended not to take Zidovudine with high-fat meals (>40g of fat).

- As the effect of food on the efficacy of a drug is food and drug specific, the counsellor should help the client draw up a food and drug timetable. This timetable should take into account both the food and drug interactions of each drug to be taken and the client's eating habits to ensure the greatest efficacy of the treatment.

➢ **Drug effects on nutrient absorption, metabolism, distribution, and excretion**

- Certain modern medications affect nutrient absorption, metabolism, and excretion. Modern medications that inhibit or enhance nutrient absorption and metabolism may have negative effects on nutritional status.
- Dietary management may require either increasing food intake, taking a nutrient supplement to compensate for the nutrient affected, or reducing the nutrient intake if the metabolite produced can negatively affect health.
- ***Drugs that may require increased food or nutrient intake***
  - The medication Isoniazid, commonly taken to treat tuberculosis, inhibits the metabolism of vitamin B6. Supplementation of this vitamin is therefore recommended.
  - The antibiotic and antituberculosis medication Rifampin may increase vitamin D metabolism. Supplementation of this vitamin D may be required.
- ***Drugs that may require reduced food or nutrient intake***
  - Studies have reported lipid abnormalities, including increased level of triglycerides, cholesterol, and fat mal-distribution, in people who have taken protease inhibitors or non-nucleoside reverse transcriptase inhibitors.
  - The protease inhibitors Saquinavir and Ritonavir may cause an elevation in cholesterol and triglycerides levels, which may increase the risk of cardiovascular diseases.
  - Most of the protease inhibitors may cause changes in lipid levels that require both dietary and medical responses.
  - Lipid abnormalities include hypertriglyceridemia, hypercholesterolemia, and lipodystrophy syndrome.
  - For hypertriglyceridemia, it is important to maintain a healthy weight, eat a variety of foods, reduce the intake of refined sugar and excessive carbohydrates, increase intake of fibre, avoid alcoholic beverages, exercise daily, and take medication to lower triglycerides.
  - For hypercholesterolemia, it is important to maintain a healthy weight, eat a diet low in fat and limited saturated fat, increase intake of fruits and vegetables, avoid food rich in cholesterol, avoid alcohol and smoking, exercise daily, and take medication to lower the cholesterol.
  - The effective management of fat mal-distribution or lipodystrophy syndrome has not yet been established. Diet and exercise, use of medications, and change in the ARV regimen can help.

- Some antiretroviral drugs may affect glucose metabolism and cause insulin resistance. Insulin resistance is associated with increased risk of diabetes.
- For diabetes, specific carbohydrate controlled diet, reduced intake of refined sugar and saturated fat, exercise, and antidiabetic medications are recommended.
- Progressive lactic acidosis is a complication of NRTI therapy.
- The signs of severe lactic acidaemia include fatigue, weight loss, abdominal pain, dyspnoea, liver dysfunction, and cardiac dysrhythmias.
- In case of any of these symptoms, stopping the NRTI may help.

## Side effects of drugs on food intake and nutrient absorption

- Modern and traditional medications may cause side effects that affect food intake and nutrient absorption.
- Side effects may include changes in taste, loss of appetite (anorexia), nausea, bloating and heartburn, constipation, vomiting and diarrhoea that affect food intake and nutrient absorption.
- Changes in taste, loss of appetite, nausea, bloating and heartburn, and constipation may lead to reduced food intake, whereas vomiting and diarrhoea can cause poor nutrient absorption.
- Reduced food intake and poor nutrient absorption can lead to the weight loss and wasting associated with faster progression of HIV to AIDS.

## Appropriate dietary responses

- Appropriate dietary responses may help maintain food intake and compensate for nutrient losses.
- Diet-related side effects need to be managed immediately to help continue proper eating habits and to maintain weight.
- Examples of appropriate dietary responses is the addition of flavour enhancers such as salt, sugar, spices, vinegar, or lemon to help stimulate the taste buds, increase taste acuity, and mask unpleasant flavours as a result of taste changes from medication.
- Eating energy and nutrient-dense foods such as maize, groundnuts, and carrots and drinking plenty of fluids may help replace nutrient losses and prevent dehydration during fever or diarrhoea.
- Because drug side effects such as changes in taste, loss of appetite, nausea, bloating and heartburn, constipation, vomiting, and diarrhoea are similar to HIV/AIDS-related symptoms, the dietary management is the same.
- Some ARVs have been associated with increased risk of bone disorders such as osteoporosis, osteopenia, and osteomalacia and may require medical and dietary responses.
- A balanced diet with high calcium foods such as milk yogurt, cheese, or calcium and vitamin D supplements may be required, along with a medical response.
- This is especially important for populations already at risk of calcium deficiencies and for pregnant and lactating women whose calcium need is increased.
- Proper nutritional management of the side effects of medications will help improve the client's adherence to the treatment.
- If not properly managed, diet-related side effects of medications often lead to interruption of treatment or poor adherence to treatment. The health worker or counsellor should provide the client with the most appropriate dietary guidance in his/her specific context.

## Unhealthy side effects of some food and drug combinations

- Combinations of specific medications and food can cause unhealthy side effects.
- Such food should not be taken at the same time as these medications.

- The consumption of alcohol can cause inflammation of the pancreas while taking Didanosine and this should be avoided.
- Alcohol should also be avoided while taking the antituberculosis medication Isoniazid, as this combination may increase the risk of inflammation of the liver.
- With Indinavir (IDV) do not drink grapefruit, which may lower the level of medicine in the blood
- Isoniazid may cause possible reactions with foods such as bananas, beer, avocados, liver, smoked pickled fish, yeast and yogurt. Avoid alcohol
- With Rifampin avoid alcohol
- With Zidovudine (AZT) avoid alcohol
- With Zidovudine/ lamivudine (AZT/3TC) avoid alcohol

## Recommendations for the proper management of food and drug interactions

- Antiretroviral therapy is becoming simpler, with fewer doses and fewer pills.
- Given the rapid evolution in antiretroviral therapy and the effects of food and drug interactions on drug efficacy and nutritional status, health providers and counsellors should know about and keep up to date on possible interactions and their management.
- The following recommendations to guide the health worker or counsellor in addressing food and drug interactions for the people living with HIV/AIDS should be supplemented by national guidelines if available.
  - Because different drugs have different food interactions, recommendations should be drug specific. Understand the specific interactions of each drug used and counsel accordingly.
  - If several drugs are taken, refer to the food and drug interactions of each.
  - Pay close attention to the client's diet and drug regimen and manage interactions that will affect nutritional status. The nutrition implications of some drug combinations differ from the implications of an individual drug. For example, food reduces the absorption of the protease inhibitor Indinavir, but when Inidinavir is taken in combination with Ritonavir or Delavirdine, studies have shown that food has no effect on its absorption, and it can be taken with or without food.
  - Involve the client in finding solutions for side effects and food-drug interactions.
  - Give special consideration to traditional medicines. While some side effects of traditional medicines may be known, many of their food and drug interactions are not known. Help the client who is taking traditional medicines alone or with other drugs to identify the side effects and food and drug interactions and use the foods available to mitigate their impact on nutritional status.
  - Be attentive to the side effects and nutritional implications of ARVs for malnourished communities in resource-limited settings. These effects have been studied primarily on well-nourished populations and are not well documented among malnourished people. Act promptly to alleviate their negative impact on the health and nutrition status.
  - Food insecurity may constrain people living with HIV/AIDS from meeting optimal food and nutrition responses. Seek alternative responses that are feasible given the circumstances.

## Special considerations for pregnant and lactating women

- Some pregnant women living with HIV/AIDS are treated with ARVs such as Nevirapine or Zidovudine or both during pregnancy or at the onset of labour to reduce mother to child transmission of HIV.

- ARVs can interact with other drugs and foods and have adverse effects on women's health and nutritional status.
- When an ARV is taken just one time at the onset of labour, the food and drug interaction and possible impact on nutritional status are limited. However, the counsellor has to counsel the mother on the appropriate timing for taking the drug to ensure the best efficacy of the treatment.
- Some pregnant women take Zidovudine from 36 weeks of pregnancy to prevent mother-to-child transmission of the virus, and others take ARVs to treat HIV/AIDS after delivery. For medium- and long-term treatment with ARVs and other drugs, ARVs can interact with other drugs and with food and have negative effects on the women's nutritional status.
- It is critical to ensure that food and drug interactions during pregnancy do not result in reduced food intake and limited weight gain for the pregnant mother. These may further weaken the mother and also contribute to low birth weight for the baby.
- The health worker or counsellor should be aware of the possible negative effects of the drugs and drug interactions on the foetus and counsel accordingly.
- Because pregnant and lactating women living with HIV/AIDS have increased nutritional needs, food and drug interactions should be managed in a timely manner to alleviate the side effects of the drugs, optimize the absorption and metabolism of nutrients, and optimize the drug efficacy. The nutritional management of drug side effects and drug and food interactions are similar to those for other people living with HIV/AIDS.
- The goal of nutritional management of food and drug interactions during pregnancy and lactation aims to ensure good health and nutrition for the mother by maintaining or improving food intake through the consumption of a variety of foods. This will help ensure adequate weight gain.
- Indicators of good nutrition include type of foods consumed, frequency of meals and quantity of food, weight gain, and the absence of micronutrient deficiencies.

### Special considerations for infants and children

- Children living with HIV are at a greater risk of malnutrition. The causes of malnutrition include:
  - Inadequate nutrient intake as a result of anorexia, nausea, oral or oesophageal lesions, or generalized malaise and weakness
  - Increased nutrient and energy requirements during hypermetabolic or hypermetabolic periods induced by fever and secondary infections
  - Increased energy cost of breathing related to respiratory infections
  - Protein, calorie, fluid, and micronutrient losses with vomiting, diarrhoea, and malabsorption
- Given the high risk of malnutrition for infants, children, and young people living with HIV/AIDS, those taking ARVs and other drugs need to be monitored closely to manage the side effects of the drugs and the food and drug interactions.
- Side effects of medications and food and drug interactions are similar to those experienced by adults living with HIV/AIDS.
- The health worker or counsellor should work closely with parents or caregivers to ensure that children do not reduce their food intake and that they eat a variety of foods, gain weight, and continue to grow.

## Activity 6: Group work

Group Demonstrations and Exhibition of food item

# Module 12
# Theme: HIV Palliative and Terminal Care

## Goal
Participant will understand the need to provide support and care that makes life comfortable for patients throughout all phases of the disease and even to death.

## Objectives
1. Provide care to the patient in his or her natural or desired environment.
2. Alleviate the intensity of manifested signs and symptoms.

## Content
- Palliative and terminal care; Overview
- Pain management
- Ethical issues
- Linkages and referral
- Bereavement counselling and family support
- Challenges in terminal and palliative care of PLWHA

## Methodology
- Lecture/Discussions
- Role Play
- Film Show

## Material needed
- Overhead projector
- Data/Multi-media projector
- Transparencies
- Flip-chart & flip-chart stand
- Markers (coloured)
- Masking tape
- Lap top
- Diskettes/other media storage devices

## Activity 1: HIV Palliative and Terminal Care

Participants will be able to identify the need for palliative and terminal care, where to provide such services and the role of the client in service provision

*Time: 20 minutes*

## Activity 2: Pain management

This session discusses the modality for appropriate pain management for patients during terminal illness

*Time: 20 minutes*

## Activity 3: Ethical dilemma in AIDS care

The session would try and address how to handle difficult situations like a request for euthanasia and the role of third parties in decision making for the dying client

*Time: 20 minutes*

## Activity 4: Family support

This activity will try to highlight the role and importance of family members as primary care providers. It reflects on the support needed to enhance the functioning ability of these primary care providers.

*Time: 30 minutes*

## Activity 5: Linkages and referral

The session will help participants to understand the need for networking to ensure adequate multi-disciplinary care of people living with AIDS. The need for instituting referral systems will also be discussed

*Time: 20 minutes*

## Activity 6: Bereavement counselling and crisis management

This is an essential component of the palliative care continuum. Participants will discuss about how to make this available to the client's loved ones and the community after the death.

*Time: 30 minutes*

## Activity 7: Group work

# Lecturer/Facilitator's notes

## Introduction

The facilitator will introduce the goal and objectives of the module. Some emphasis will also be laid on the importance of palliative care as part of the care needs of PLWHA. The resource person for this module will then be introduced

*Time: 5 minutes*

## Activity 1: HIV Palliative and Terminal Care: Overview

- Palliative care is defined as care that "focuses on promoting quality of life in people with advanced disease, maximizing a person's ability to continue to function for as long as possible, and supporting family or friends caring for them".
- Palliative care aims at improving the quality of daily life by removing or alleviating unpleasant symptoms and helping prevent the patient from suffering fear or loneliness
- Palliative care may be combined with therapies aimed at reducing or curing the illness or it may be the total focus of care.
- Palliative care should be planned through the collaborative efforts of an interdisciplinary team including individual, family and caregivers. It should be available to the individual and his/her family at any time during the illness trajectory and bereavement.
- Palliative care is based on the belief that:
  - When living with a life threatening illness, and especially when dying, every individual has the right to participate in informed decision about the health care resource options, and to choose the best possible option to maximize the quality of his/her life.
  - Palliative care strives to meet physical, psychological, social, and spiritual needs of individuals and families, with sensitivity to personal, cultural and religious values, beliefs and practices. This includes supportive interventions at the discretion of the individual.
  - Care should be delivered in a person focused, family centered environment.
  - It is the individual's right to access information and services from an interdisciplinary team of appropriately trained professionals and volunteers, while receiving continuing palliative care education.

### Principles of palliative care

- Unit/Holistic care: Meets the physical, psychosocial, social, and spiritual expectations and needs of the person and his/her family with sensitivity to personal, cultural and religious values, beliefs and practices.
- Information as a right: It is the individual's right to be informed about his/her disease, potential treatments and outcomes, appropriate resources and options. It is the family and the caregiver's right to be informed about the disease, potential treatments and outcomes, appropriate resources and options, respecting the individual's right to confidentially.
- Access to care and information as a right: Decisions are made by the individual and family in collaboration with caregivers, respecting the level of participation desired by

the individual and family. The individual's and family's choices for care, settings of care and information sharing are respected within the limits of available resources. Individuals and families should have timely access to information and services provided by palliative care, when they need them and when prepared to accept essential palliative care, services should be available 24 hours/day, 7 days/week.

- Equal availability of services without discrimination: Services are equally available to all regardless of age, gender, national and ethnic origin, geographical location, race, colour, language, creed, religion, sexual orientation, diagnosis, disability, ability to pay, criminal conviction, or family status.
- Ethics, human right and confidentiality: Care is provided in accordance with principles of ethics, including confidentiality.
- Interdisciplinary team: Care is provided by an interdisciplinary team of caregivers working as collaborators with the individual and family.
- Continuity of care: A coordinated, continuous plan of care incorporating minimal duplication is maintained across all settings of care,
- All who provide therapies that comfort and support through the illness trajectory and into the bereavement period should strive to achieve the standard of practice implied by the philosophy and principles of palliative care as shown above.

## Challenges of palliative care

### 1. Multiple problems/complexity of care

- This challenge to palliative care is due to the dynamic nature of HIV/AIDS treatment.

- Persons living with HIV/AIDS are surviving longer and are experiencing more problems as a result of treatment advances
- Under optimal circumstances, survival with a diagnosis of AIDS has increased to 23-30 months (even in Nigeria), of which up to 50% of these days may be associated with the need for palliative care. (depending on the level and quality of care)
- Multiple simultaneous opportunistic infections and /or cancers, as well as multiple complex symptoms control and psychosocial issues play important role in the outcome.
- Complex inter-relationship of the problems and their therapies.
- New treatment options have shifted care from inpatient settings to either outpatient clinics or the person's home
- In Nigeria, approximately over 60% of persons living with HIV/AIDS avoid hospitalization or require only a brief admission immediately prior to death.

### 2. Conceptualization of palliative care protocol for palliative care

- Palliative care evolved from the management of persons living with cancer. It developed from the ideology that cancer could be beaten: that treatment usually starts with a period of active and aggressive therapy, followed by a cure or period of remission and ultimately by a transition to palliative care. In many ways, the

original perception of palliative care, and when to access services, is an impediment to care and the development of care delivery models for HIV/AIDS.

- The current trend is to involve the broad range of palliative care services when the individual is first diagnosed with a life-threatening illness. These interventions can range from simply providing information about palliative care services to working with those with HIV/AIDS and their families on advance planning or anticipatory grief issues.
- This shift in conceptualization of palliative care has now been adopted nationally and internationally. It is one of the important insights that HIV/AIDS has given to the delivery of health care. However, the co conceptualization of palliative care continues to evolve due to the tensions inherent in balancing investigation, diagnosis and treatment versus measures directed solely at palliative comfort

### 3. Socio-economic impacts of the disease

- Further additions to this complexity are the variety and diversity of the psychosocial issues faced by those with HIV/AIDS, their families and friends.

- Judgments are often made about a person's lifestyle that results in physical and social isolation. Financial losses may accrue as a result of job loss and, as the disease progresses, palliative care issues can be compounded by lack of housing, poor nutrition and inability to afford treatment.
- Multiple experimental and newly approved medications, many of which may need to be continued up to or close to death, are often expensive and unique to HIV/AIDS, and may not be covered by provincial health plans. Stigmatization and social isolation occur at unprecedented levels in HIV/AIDS palliative care and challenge caregivers to seek out or define new service options and partnerships.

## Activity 2: Pain management

- In Nigeria, resources are scarce and basic health care facilities are not standard. Curative drugs, including those for some common opportunistic infections, are expensive and may not be available or affordable.
- In these circumstances the relief of pain and symptomatic management of symptoms are very important to ease suffering for the patients and members of their families. Also in our scenario, support system becomes very much needed and valuable to those that are affected.
- Counselling at a latter phase of the HIV infection becomes valuable as well as part of the impo\rtant services that can be provided to the client. Palliative care should be linked to the continuum of care for patient and this should be pursued when feasible.
- Principles involved in relieving pain in PLWHA

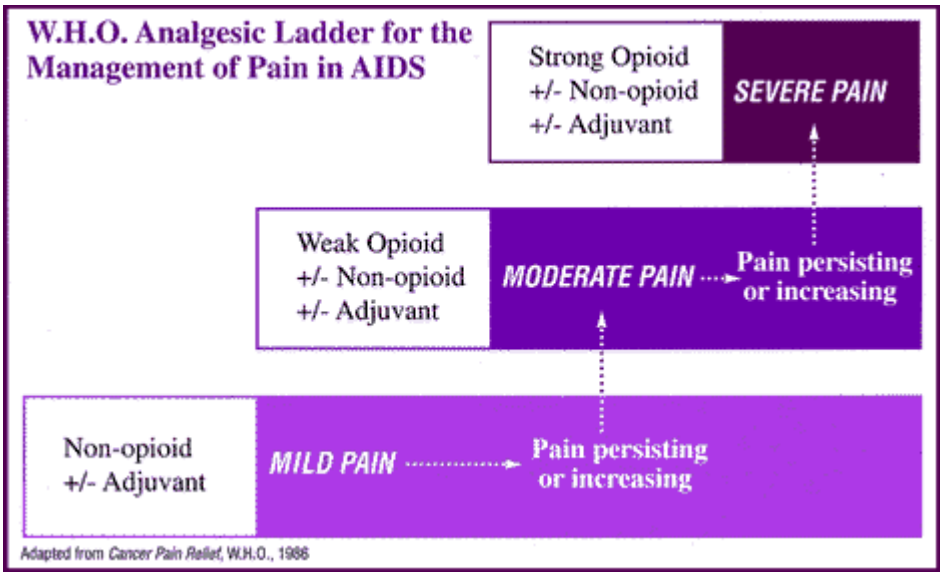
  - Pain is what the patient says hurts and it is always subjective
  - Help the patient to live a pain free life as possible
  - Do not withhold pain relief
  - Review pain medication frequently and increase when necessary
  - If possible give by mouth

- Do not give pain relief PRN
- Pain treatment does not replace other active therapies – e.g. pain may be associated with infections, therefore the infection must also be treated energetically.
- Physical pain can lead to anxiety and or depression, which in turn can lower a person's pain threshold.
- The International Society for the Study of Pain has defined pain as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage" -- a definition that emphasizes the highly subjective nature of pain.
- There are no readily available, reliable, objective criteria for measuring pain, and as a result many patients who suffer severe pain are undertreated or even untreated.
- For patients with a terminal disease such as AIDS, proper and adequate control of pain is perhaps the single most important factor in helping those patients maintain their dignity and self-sufficiency, especially in the last stages of the disease. Moreover, effective control of pain may be the most important determinant of quality of life for such patients.
- Because pain cannot be assessed by purely objective criteria, the patient's subjective assessment is essential to accurate diagnosis and effective management.
- Social and cultural factors play major roles in the self-assessment of pain, and behavioural patterning, set down in early childhood, influences the patient's pain experience.
- While sensation threshold does not differ from culture to culture or among members of different communities, the translation of sensation into pain does differ widely from patient to patient.
- Pain secondary to HIV infection should be thought of, and treated, like the pain associated with malignant disease. Like cancer pain, AIDS-related pain can be caused by many factors, including nociceptive and neuropathic etiologies.
- The available medications to treat pain include conventional narcotic analgesics and non-steroidal anti-inflammatory drugs as well as neuroactive and psychoactive agents. Each has its place in the pharmacological management of one or more of these pain syndromes
- Medication is mandatory in AIDS patients with pain, but drugs are not the only means of alleviating pain. Alternative or adjuvant modalities include transcutaneous electrical nerve stimulation, hypnosis, biofeedback, nerve blocks, and physical therapy. These non-pharmacological alternatives are beyond the scope of this workshop, but clinicians should be aware of their existence and their potential utility.

  The clinical management of all pain syndromes should begin with an attempt to identify and treat the underlying cause of the pain. On occasion, especially in patients with well advanced HIV disease who suffer from concurrent infections and/or neoplasms, the underlying cause of a patient's pain cannot be identified or cannot be treated. Fortunately, this situation does not preempt effective pain management; it simply shifts the focus of treatment from the cause to the pain itself.
- Regardless of cause, the objective of treatment is threefold: to reduce the patient's discomfort, decreased his anxiety, and return him to his previous level of function. There are no easy formulas to achieve these objectives. Treatment must

always be individualized, because patients exhibit a remarkably wide range of pain tolerance and an equally wide range of responsiveness to pharmacotherapy.

- The vast majority of all complaints of pain arise from acute and subacute causes. Here the underlying problem is usually tissue injury, either from intrinsic or extrinsic causes. For these forms of pain, the essence of effective clinical management is to provide good analgesic support while the body has time to repair itself.
- Chronic malignant and non-malignant pain with ongoing tissue injury is categorized as ongoing or recurrent acute pain. Pain in AIDS is often a combination of the two. For these patients it is imperative to follow the pain analgesic ladder that the World Health Organization developed for cancer patients in 1990. Each step in the ladder represents a further step in the pharmacologic management of the patient's pain, steps necessitated by progression of disease or progression of symptoms.
- The WHO analgesic ladder does not take into account neuropathic pain, from which many AIDS patients suffer, either as a direct result of some disease process or as an indirect result of antiretroviral therapy. Therefore medications that reduce the pain associated with neuropathies should be used in all affected patients.
- At the first rung of the WHO ladder are non-steroidal anti-inflammatory drugs and aspirin see table below. NSAIDs reduce pain by decreasing prostaglandin synthesis, relieving mild to moderate inflammation, and exerting an antipyretic effect. Aspirin, because of its long history of safety and effectiveness, has been the prototype against which all NSAIDs have been judged. These agents have a ceiling effect, a dose above which there is no additional benefit, but they also have no tolerance limits or addiction potential. These drugs have roughly the same activity when given in equipotent doses. The major limiting factors are adverse reactions and convenience of dosage schedules.
- Acetaminophen, which is marketed under many trade names, is not a NSAID. Although it is an antipyretic agent, it has no peripheral anti-inflammatory or prostaglandin inhibitory activity. It does, however, have analgesic properties, probably through CNS activity. The usual dose is 650-1000 mg every 4-6 hours by mouth or per rectum, with a maximum daily dosage of 6-8 grams. It can be given in conjunction with NSAIDs and narcotic analgesics (whose activity it can potentiate).



## Management of mild-to-moderate pain

- Many narcotic analgesics can be used to treat mild-to-moderate AIDS-related pain. In outpatient situations, the most convenient route of administration is via the GI tract (oral or rectal). This route has the added benefit of preventing abrupt swings in serum levels, providing a slow onset and slow decay. Care must be taken when giving parenteral narcotics that adequate time is allowed for gastrointestinal absorption, which can take up to 90 minutes. Repeat doses should be given well before serum drug concentrations drop to subtherapeutic levels.
- The ideal way to use narcotics is to titrate them to the desired level of efficacy, on a case-by-case basis. With the important exceptions of meperidine, propoxyphene and pentazocine, there are no peak doses for narcotics, as there are with NSAIDs. The major limiting factor in increasing narcotic doses is the escalation of undesirable side effects (such as constipation, sedation, respiratory suppression, and confusion). When narcotics are used for the treatment of pain, it is unlikely that habituation will become a factor. In any case, the specter of addiction should not be a consideration in the use of these analgesics if they are deemed necessary for the management of pain in late-stage HIV disease.
- The therapeutic goal of any analgesic regimen is to achieve an adequate serum level, one sufficiently high to assure pain relief in the resting state, with additional medication readily available to provide analgesia for breakthrough pain. Doses should be spaced well within the drug's serum half-life, to maintain effective serum levels. This is most easily accomplished by providing medication on a fixed schedule for background analgesia. Additionally, some rapid-onset medication should be available for breakthrough pain on an "as needed" basis.
- The longer-acting narcotic analgesics are the logical choice for background analgesia because they achieve extremely stable serum narcotic levels with only a few doses per day. The same effect can be attained with the shorter-acting narcotics, but they require frequent dosing. These shorter-acting narcotics do provide good coverage for breakthrough pain, however.

## Management of moderate-to-severe pain

- Narcotic analgesics are rarely used for mild pain, but they are frequently used in cases of moderate to severe pain. Pharmacologically, they are of two classes: pure opiate-receptor agonists, and mixed agonist-antagonists that have some properties of naloxone (an opiate-receptor antagonist) mixed with the direct agonist properties.
- The prototype pure receptor agonist is morphine, although there are many drugs in this class. The mixed agonist-antagonist analgesics have been slow to achieve popularity for several reasons: a ceiling effect for analgesia, reversal of analgesia in patients who are also taking pure agonists, and the unavailability of oral preparations.
- For the sustained pain from which many patients with end-stage AIDS suffer, it is most appropriate to use a sustained-release narcotic analgesic. The specific agent chosen is less important than the principal that maintaining a therapeutic blood level of opiate is the most appropriate treatment for long-standing pain.

- In order to avoid overdosing, the sustained-release opiate should be dosed for analgesia with the patient at rest. Incident or breakthrough pain can then be treated with small doses of immediate-release short-acting opiates.
- In this context it is important for the care-provider to remember that opiates should be given in escalating doses until the desired effect is achieved. Side effects are the only limiting factor. In the clinical management of intractable long-standing pain, there is no specific dose of opiate, and no ceiling above which further dosing is inadvisable. Therefore, the opiate dose should be pushed to whatever level it takes to make the patient comfortable, especially at the end of life.
- Neuropathic pain may be resistant to opiate dosing alone. For severe neuropathies, the dose of opiate should be titrated upwards, but adjuvant drugs should be used concomitantly.
- Neuropathic pain syndromes are managed first with a tricyclic antidepressant (TCA) given once daily, usually at bedtime.
- It is important for AIDS patients to lead as normal a day/night cycle as possible, and these drugs not only help manage neuropathic pain, they are for the most part sufficiently sedating to be used as a sleep aid as well.
- Although amitriptyline as generally regarded as the first-line TCA, the anticholinergic side effects and excess sedation of this and the other first-generation TCAs, doxepin and imipramine, limit their usefulness. Most patients find nortriptyline or desipramine to be as effective as the first generation TCAs in controlling neuropathic pain, and they usually experience fewer deleterious side effects. This increases compliance and, with it, effectiveness.
- In many cases of AIDS-related neuropathic pain, a TCA alone proves inadequate, and additional agents must be started. Antiseizure drugs such as carbamazepine and phenytoin can be helpful, but both have significant side effects and toxicities which can make their use inadvisable, especially at very sick patients.
- A newer antiseizure agent, gabapentin, holds great promise of diminishing neuropathic pain with a minimum of side effects. Clonazepam, a benzodiazepine antiseizure drug, can be very potent, especially when used in combination with gabapentin.
- It is within the ability of current clinical practice to deliver a high degree of pain control to most patients with end-stage HIV disease -- without sacrificing their sense of self and their ability to think and function. In some patients, more invasive techniques may be needed, including spinal narcotics and destructive nerve-block procedures.
- However, these patients are the exceptions to the rule. In the vast majority of cases, carefully considered titration of medication can result in a satisfactory outcome, one that ablates the patient's pain and maintains his dignity and comfort.

# Activity 3: Ethical dilemma in AIDS care

## Euthanasia

- This refers to the deliberate administration (or non administration) of medicine or life support services to end life. It may also entail providing patients with the mans to end their life should they choose to do so
- Often times because of the prolonged suffering associated with AIDS, patients may request for assisted death (euthanasia). How should this be handled?
- Apart from in The Netherlands, euthanasia is against the law, and classed as a criminal act.
- Euthanasia is popularly taken to mean the practice of helping severely-ill people die, either at their request or by taking the decision to withdraw life support.
- The law in Nigeria do not allow euthanasia even if a patient wants to die - as a matter of public policy, the victim's consent does not provide a defence.
- Deliberate euthanasia would normally leave anyone assisting liable for murder, though liability can be reduced to manslaughter on the basis of diminished responsibility.
- Passive euthanasia is when treatment to which the patient has not consented is ended.
- Active euthanasia occurs when treatment is administered with the intention of ending the patient's life.

## Third party involvement in decision making

- While trying to ensure confidentiality with patients' information during care, a dilemma results during the period of palliative care.
- At this time, the client would need extra support for care. This support would often come from the family members who act as the primary care provider. Who do you relate confidential information to in such situation?
- The client should be consulted on whom to relate information about care and support to.
- Where there has not been disclosure about HIV status to primary carers, care of client may predispose to cross infection, it would be necessary to educate the carers on how to observe precautions in handling body fluids without breaching confidentiality.
- Clients counselling should however continue with the client being encouraged to confide in a possible primary carer who can help to offer the much needed assistance and care at the terminal stage.

## Writing a Will

- Like in all chronic illness, clients should be encouraged to write a will before death. This would help resolve issues of child care and address some concerns of the clients after death.
- The care provider should assist the client to access all the legal aids necessary for writing a legal document which can be enforced after death.
- The content of the will should be a true reflection of the interest of the client. It is therefore important that this should be done when the client can still best articulate issues.

## Notification of death and burial

- When death occurs, the doctor will confirm the death and issue the Death Certificate.
- Death certificates are required for claiming insurance and survivor's annuity respectively, so it is recommended to receive original copies.

- An autopsy report would identify the cause of death. Usually what the autopsy report would read is the pathological cause of death and not HIV/AIDS
- Notification of death should be made to the next of kin identified by the client in the hospital records
- Burial arrangements should be made as with other death cases.
- Often times clients' family ask if there is need to make special arrangement for the burial of a PLWHA. This is not necessary.

## Activity 4: Family support

- The family is often the primary career for PLWHA
- In a number of cases, the women in the house are often overburdened with the care of PLWHA and therefore need help
- Help and support for the family can come from peers, relatives and the community
- This help can be facilitated through the effective use of linkages and referral services available and accessible within the locality
- Where the elderlies become the primary care provider, a lot of assistance is needed not only for the ill but also for effective children care
- Family support programs could be designed to educate and empower youth, individuals, families, and their communities in the areas of HIV/AIDS Awareness and Parent Education.
- Services could offer assistance in ensuring access to health care facilities, offering instruction in preventive health care, gaining knowledge of preventive and care medicine and making sustainable changes to maintain a healthy positive lifestyle.
- Some of the issues that may present itself as a problem when working with families include*:* Gender, power, hierarchy, roles, rivalry, unspoken issues, alliances, secrets, intergenerational issues, money, work, school, leisure time, poverty, keeping track of what is going on, being asked to ally with certain family members, remaining neutral, expectations, giving information, dependency, time, shame, embarrassment, violence, abuse.

## Activity 5: Linkages and referral

### Linkages can be fostered in many ways

- Programme developers can establish linkages by integrating care, treatment and support services into existing health services.
- Clinicians can expand their practices to include necessary referrals and then follow up to ensure families have easy access to linked services.
- Community workers, including lay counsellors, can assist PLWHA in obtaining treatment, care, and support services.

### Linkages between health care services and HIV services

- Health care services are entry points for treatment, care, and support of persons who are HIV-infected and other family members.
- Treatment programmes can be integrated health care services through the development of human capacity and programme development.
- All PLWHA on treatment require follow up and appropriate care.
- Community health workers provide information on health promotion and disease prevention, as well as care, treatment and support services to these families.

- Specialists in HIV who care for PLWHA may provide consultation, antiretroviral treatment, and help with the ongoing management of HIV infection.

## Linkages with other health programmes for special needs

- Some programmes target specific health needs, such as family planning, treatment of sexually transmitted infections (STIs), or assistance with substance abuse.
- Disease-specific programmes, such as those for people with tuberculosis (TB) may benefit PLWHA
- Nutritional support programmes are especially important for people living with HIV/AIDS.

## Linkages to community–based AIDS service organisations

- Linkages to community-based organisations can provide the resources to help PLWHA and their families cope with the isolation, social stigma, economic and emotional pressures that often accompany a diagnosis of HIV infection. Such linkages may provide PLWHA a way to become involved in voluntary or paid HIV-related work. These groups include:
  - Non-governmental organisations (NGOs)
  - Faith-based organisations (FBOs)
  - Community-based organisations (CBOs)
  - Traditional Healers

## Disclosure of HIV Status to Children

- A nagging and difficult issue is when and how to disclose the illness to the child and who should do the disclosing
- Generally, the parents alone or parents together with the health care provider are the key participants
- Nonetheless, the physician cannot escape the responsibility in working with parents and other professionals to ensure disclosure is done appropriately
- Disclosure can be effected at any age depending on the child's capacity to understand. What is important is the language and detail of content
- "Chronic illness needing regular medication, regular laboratory sampling and regular visits to the doctor" to "...you have HIV acquired this way..."
- Help sensitize the child against who needs to know

# Activity 6: Bereavement counselling and crisis management

## Crisis management

Suggestions for approaches:

- Focus on the present circumstances of the crisis event – if someone is not emotional, this will encourage the person's cognitive grasp of the situation and help them think things through. If they are caught up in emotions, it is difficult to think clearly.
- Find out:
  - What happened?
  - When did it happen?
  - Who/what is involved?
  - Where did it happen?
  - Where is the person calling from?
  - Find out if the person is in a difficult situation
  - What is the most pressing problem?
  - Who is with the individual?
  - Who else can be called for support?
  - What else can be one?
  - Shall I call you back?
- Being concrete helps to keep the person in reality
- Venting feelings - letting the person talk and acknowledging their upset and distress helps to relieve tension (but be careful not to be patronising—empathy not sympathy)
- Once feeling has been vented people can think more clearly and break up the situation into manageable pieces and make decisions on actions to be taken.
- There is often a fine line between allowing someone to vent and the need to be very practical and get information. Sometimes you have to let the person vent first and then ask the practical questions, at other times, because so much feeling is being expressed it is best to ask the practical questions if you can, try and focus the person (the cognitive approach). Partly this depends on the immediate situation and partly on your style and what you are comfortable with.

## Bereavement/loss and dealing with catastrophe

- Although different, the feelings and ways of dealing with bereavement and catastrophe/trauma can have similar characteristics. Often, a trauma is associated with a sense of loss – not always a death – i.e., divorce, robbery, sexual assault, evacuation, losing a job unexpectedly, finding out you have an incurable disease.
- There are typical stages that most people go through when confronted by sudden, unexpected loss and tragedy.

- The important thing is to be able to accept the bereaved/upset person with all their ambivalences, contradictions and complexities. In accepting and understanding the grieving process, you can give reassurance that while each grief/tragedy

experienced is personal and unique, the person experiencing it is not abnormal in the ways that they express themselves.

- If someone is angry, remember it is not you they are really angry at – try not to take it personally. Allow the person to be angry but without abusing you. If they are out of control, tell them you will call/come back in 10 minutes or get them to call/come back.
- Always give people as much information as possible, and if you don't have it tell them you'll find out and get back to them. Do not lie or make things up to make it easier at that moment in time. It will come back to haunt you!
- If you can, always tell people they can come back or call you back or you will call them. It is very reassuring to people to know that there is that concern and care (of course practically you may not have time for much of this, but it does sometimes lessen anxiety and therefore people's demands!).
- If things feel out of control and you are out of your depth – get help – don't feel you have to do it on your own.

## Activity 7: Group work

- Role play on ethical dilemma faced by Nurses and patients.
- Film show on patients who are on HIV palliative and terminal care

# Module 13
# Theme: Women and HIV/AIDS

## Goal
Participant will appreciate the vulnerability of women and children to HIV/AIDS infection and the nursing implications of effective management.

## Objectives
1. Understand the special circumstances in women with HIV/AIDS and how they impact on clinical management decisions in ARV therapy, prevention and control.
2. Know how to implement ARV treatment regimens in this special circumstances in women with HIV/AIDS.
3. Appreciate the impact of these special circumstances on infants, children and orphans.

## Content
- Background of women and HIV/AIDS
- Interaction between HIV and pregnancy, delivery and puerperium
- Counselling, protocol and community PMTCT
- Nursing management strategies.

## Methodology
- Lecture/Discussion
- Group Discussion (Sharing Experience)
- Demonstration

## Material needed
- Overhead projector
- Data/Multi-media projector
- Transparencies
- Flip-chart & flip-chart stand
- Markers (coloured)
- Masking tape
- Lap top
- Diskettes/other media storage devices

## Activity 1: Women and HIV/AIDS

During this session, the participants will gain insight into why the HIV epidemic is addressed as having a woman's face.

*Time: 10 minutes*

## Activity 2: HIV, pregnancy, delivery and puerperium

The session will focus on the effects of pregnancy, on mother's predisposition to HIV infection, the effect of progression of existing HIV infection, effects of HIV on pregnancy and the implication of maternal infection on ARV use.

*Time: 20 minutes*

## Activity 3: Mother to Child Transmission

Participants will get to learn about factors that affect or increase the risk of HIV transmission from an infected mother to the child, and its implications on feeding practice.

*Time: 20 minutes*

## Activity 4: Preventing Mother to Child Transmission of HIV

The facilitators will discuss the various components of care that ensure comprehensive services that can prevent mother to child transmission of HIV infection.

*Time: 30 minutes*

## Activity 5: Group work

# Facilitators/ Lecturers Notes

## Introduction

The facilitator will introduce the goal and objectives of the module. Prelude to the discussion on activity, the facilitator will discuss about the woman and the peculiarities of the HIV epidemic which tends to give it a woman face. The resource persons for this module will then be introduced.

*Time: 5 minutes*

## Activity 1: Women and HIV/AIDS

There are various factors that make women vulnerable to HIV infection. This is in view, of the fact that the risk of women becoming infected with HIV and STI during unprotected vaginal intercourse is 2 to 4 times higher in women than men. These factors include:

- Biological factors
  - Women have larger surface area of the genital mucosa that can be exposed to the semen and thus enhance transmission of infection
  - Semen infected with HIV contains higher concentrations of virus than vaginal fluid. This makes male to female transmission more possible than otherwise
  - Young women have immature cervix and scanty vaginal secretion. This increases young women predisposition to HIV infection as barrier to infection is reduced
  - Women become more vulnerable again after menopause
  - Tearing and bleeding during intercourse further increase predisposition to infection. This can occur during rough vaginal sex, anal sex, dry sex or rape
  - Untreated STIs multiplies the risk of HIV infection by 300-400%. It is usually more difficult to recognize STIs in women and, thus would not recognize the presence of a risk factor.
- Socio-cultural factors
  - Economic and societal approved dependency on men make women less able to negotiate sex or condom use even when there is evidence of possible risk of infection.
  - Rights of women are abused and often violated.
  - Condom use by stable partners is often frowned at.
  - Cultural practices often expose women to multiple partners e.g. polygamy, widow inheritance, wife hospitality.
- Others
  - In addition, in some countries the legal and political status of women makes them more vulnerable to HIV/AIDS.
  - The stigma associated with HIV can cause isolation and depression, particularly if governments, religious leaders, and community leaders do not discuss the disease (UNAIDS 2001).

## Activity 2: HIV, pregnancy, delivery and puerperium

### Pregnancy

- HIV may have adverse effect on pregnancy course and outcome.
- During pregnancy, absolute CD4 count may decline due to secondary to haemodilution. However, the CD4 count during pregnancy remains stable

- HIV infection has also been associated with increased incidence of still birth, spontaneous abortion, increased incidence of perinatal and infant mortality as well as low birth child weight and intra-uterine growth retardation.
- All pregnant women with HIV infection should be treated with antiretroviral therapy regardless of CD4 cell count or viral load.
- Perinatal transmission directly correlates with viral load
- The risk of transmission is lowered with antiretroviral therapy
- The recommendation to treat all pregnant women is a clear departure from the most current DHHS guidelines for non-pregnant adults and adolescents, which suggest deferral of treatment until the CD4 count drops below 350 cells/mm3 and/or viral load rises above 30,000-55,000 c/ml
- The reason for this difference is the additional goal in each pregnancy to reduce perinatal transmission
- In antiretroviral-naïve women, initiation of therapy may be delayed until after the first trimester due to theoretical concerns, regarding risk of adverse effects with drug administration during the period of organ formation.
- The recommendation is to include AZT as part of the overall antiretroviral regimen using each of the three components of the 076 protocol: antepartum, intrapartum, neonatal.
- This drug appears to confer benefit in reducing perinatal transmission even when it has little or no effect on viral load and even in the presence of AZT-resistant virus.
- With viral load >1000 c/ml a standard HAART regimen in addition to the 076 regimen is recommended
- When the pregnant woman cannot take AZT because of side effects or toxicity, the intrapartum and newborn components of the 076 protocol should still be utilized. With regards to other drugs, the following points are to be emphasized:
  The combination of ddI and d4T should be prescribed with caution during pregnancy and avoided if possible due to reports of three deaths in pregnant women who were receiving this regimen and developed lactic acidosis
  - The oral solution of amprenavir contains large quantities of propylene glycol, which cannot be metabolized in pregnancy. The capsule form of amprenavir is not problematic.
  - Hydroxyurea should be strictly avoided during pregnancy due to teratogenicity.
  - Efavirenz should be avoided in pregnancy, especially during the first trimester, because of teratogenic effects in a primate model. It should be noted that this drug has not been studied in human pregnancies and other antiretroviral drugs have not been tested in a primate model. The safety of using efavirenz after the first trimester when major organ formation is complete is unknown but may be a consideration in women with limited therapeutic options.
  - AZT and d4T should not be used together in any HIV-infected patient due to pharmacologic antagonism.
  - Nevirapine is included in two of four recommended options for untreated women who present in labour. This drug may be given using an oral dose of 200 mg per oral at onset of labour plus a single dose of 2 mg/kg to the infant at 48-72 hours. An alternative is to combine this regimen with AZT according to the ACTG 076 protocol for intrapartum and postpartum management. Recently reported results of the PACTG 316 study found no additional benefit to adding this regimen to an already existing standard antiretroviral regimen in terms of perinatal prophylaxis. Women with greater than 250 CD4 cells/$mm^3$ have a greater change for developing

idiosyncratic nevirapine-induced hepatitis, hence these patients need careful monitoring and counselling.

- As more women with HIV are considering pregnancy because of the therapeutic advances in HIV care as well as dramatic reductions in perinatal transmission, it is important to give appropriate preconception care and counselling to HIV-infected women of childbearing age
- Recommended components of preconception counselling include:
  - Selection of effective and appropriate contraceptive methods to reduce the likelihood of unintended pregnancy.
  - Counselling about perinatal transmission risks and prevention, and potential effects of HIV or treatment on pregnancy course and outcomes.
  - Initiation or modification of antiretroviral therapy prior to conception in order to: avoid agents with potential fetal toxicity; choose agents effective in reducing risk of perinatal transmission; attain a stable and maximally suppressed maternal viral load; and evaluate and manage therapy associated side-effects which can adversely affect maternal-fetal health outcomes.

    Give indicated immunizations and/or OI prophylaxis.

    Optimize maternal nutritional status.

    Screen for psychological and substance abuse disorders.

    Implement other standard components of preconception evaluation and management.

## Cesarean Section

- Scheduled C-section should be considered for women who have viral loads >1000c/mL at 36 weeks
- The recommended timing for this intervention is 38 weeks gestation. Current studies show no benefit to this approach if C-section is performed after the onset of labour or ruptured membranes
- The decision for this intervention requires full informed consent by the mother in terms of risks and benefits
- The major benefit is a significant reduction in the probability of perinatal transmission in these women
- Although data are limited, it is thought to be unlikely that C-section has additional benefit in women who are on antiretroviral therapy and have suppression of viral load to below 1000 c/ml
- Although data have not conclusively shown an increase in post-Cesarean morbidity in HIV-infected women compared to uninfected women, a recent study found a 3-4 fold increase in risk of fever, UTI, or any postpartum morbidity in HIV-infected women having a C-section compared to those with spontaneous vaginal delivery
- A few other principles are worth mentioning as applied to pregnancy and HIV infection. First, some authorities feel that antiretroviral therapy should be suspended during the first trimester in women who enter pregnancy on therapy based on concerns for infant exposure during the period of organ development. This is a theoretical concern that must be addressed in the context of risk/benefit on an individual basis
- Many women have difficulty tolerating certain antiretroviral agents, especially those that have gastrointestinal side effects, since these may be exacerbated by the nausea and vomiting common in early pregnancy. If there is difficulty maintaining adherence or concerns about adequate absorption because of these problems, therapy may need to be temporarily suspended and, if so, all drugs should be stopped and later restarted simultaneously

- An alternative would be a change in regimen to one better tolerated but equally effective.
- Finally, patient monitoring of CD4 count, viral load, and indications for resistance testing are the same for pregnant and for non-pregnant women. Some adverse drug reactions (e.g., hyperglycemia) may be more common in pregnancy because of interaction with pregnancy-related physiologic changes, or may be overlooked because of similarity to symptoms common in pregnancy, or may be confused with pregnancy-specific pathologies (such as lactic acidosis and fatty liver of pregnancy)
- The clinician caring for the pregnant woman with HIV should maintain a high index of suspicion for the possibility of adverse drug reactions and should monitor as indicated.
- The ultimate goals of therapy in pregnancy are to prevent mother-to-child transmission and to reduce viral load in the mother as much as possible for as long as possible while retaining reasonable therapeutic options for the future and preserving quality of life as much as possible.

### Adherence issues in pregnancy

- Adherence may be more difficult in pregnant and postpartum women than non-pregnant women
- Obstacles to adherence may include
  - Morning sickness and GI upset, which can be further compounded by ARV-associated nausea
  - Fears that ARV drugs might harm fetus
- To reduce potential for emergence of resistance, if therapy requires temporary discontinuation for any reason during pregnancy, stop and restart all drugs simultaneously
- Physical changes of postpartum period coupled with stresses and demands of caring for a newborn may make adherence to treatment especially difficult after birth

## Activity 3: Mother to child transmission

- Mother to child transmission of HIV can occur during pregnancy, delivery or postpartum via breast feeding. Without intervention, the rate is about 30-40%
  - *In utero* (25% of total)
  - Peripartum (50% of total)
  - During breast feeding (25% of total)
- Maternal factors that increase the risk of HIV transmission to the child include her impaired immune status; advanced clinical disease, elevated virus load, deficiency of antibodies or cell mediated responses; impaired nutritional status; presence of STIs; high risk behaviours such as smoking, substance abuse; and vitamin A deficiency.
- Obstetric risk factors include prolonged rupture of the membrane (of more than 4 hours); intrapartum haemorrhage; invasive obstetrics procedure such as aminiocentesis, invasive foetal monitoring; vaginal delivery and forceps delivery.
- Foetal risk factors include prematurity and multiple gestation with leading foetus having increased risk of infection in comparison to subsequent foetus(es)
- Infant risk factors such as mixed or exclusive breast feeding and presence of oral thrush in the child's mouth
- Detection of HIV in foetal tissue as early as 8 weeks and in infected placenta has supported the role of intrauterine infection by this mode of transmission.

- Transmission to the infant in early pregnancy would presumably allow for significant virus replication and result in positive PCR and culture at the time of birth. In contrast, HIV-infected infants who test negative at birth but later develop PCR or culture results are more likely to be infected at delivery. Accumulating evidence suggests that most vertical transmission occurs at delivery and there are evidence that cesarean section is protective at viral load > 1000 copies/ml.
- *In utero* transmission is the least well studied including the time of transmission. Some fraction of 1st trimester abortions is due to HIV infection of the fetus. Some live-born children have thymic damage at birth which implies that infection occurred during the first or early second trimester. Recent data from Thailand imply that most of *in utero* transmission occurs during the 3rd trimester.
- HIV has been isolated from breast milk and viral RNA has been quantitated in this fluid as well. Several cohort studies have found higher rates of HIV transmission in breastfed compared to bottle-fed infants
- The WHO/UNAIDS suggest that one third of infant infections in Africa are due to breast milk and they therefore recommend break milk substitutes if the can be safely prepared.

## HIV transmission during pregnancy

- There is a 5-10% risk of transmission of HIV during pregnancy. A child is considered to have been infected in utero if the HIV genome is detected within 48 hours of delivery by a polymerase chain reaction test (DNA-PCR) or viral culture. Transmission during pregnancy occurs when the placental protection of the foetus is compromised, allowing for viral transmission.
- The following factors are associated with transmission during pregnancy:
  - A viral, bacterial, or parasitic placental infection in the mother during pregnancy
  - HIV infection of the mother during pregnancy
  - Severe immune deficiency associated with advanced AIDS in the mother
  - Malnutrition

## HIV transmission during labour and delivery

- There is a 10-20% risk of transmission of HIV during labour and delivery. Consider transmission to have occurred intrapartum if the results of the diagnostic tests were negative during the first 48 hours after delivery but became positive in subsequent samples taken within 7-90 days of delivery.
- During labour and delivery transmission most often occurs when babies suck, imbibe, or aspirate maternal blood or cervical secretions containing HIV.
- Higher risks of HIV transmission during labour and delivery are associated with duration of membrane rupture, acute chorioamnionitis resulting from untreated sexually transmitted infections (STIs) or other infections, and invasive delivery techniques that increase the baby's contact with the mother's blood (WHO 1999).

## HIV transmission during breastfeeding

- There is a 10-20% risk of transmission of HIV through breastfeeding.
- The time that HIV transmission occurs following birth is difficult to determine precisely. The presence of maternal antibodies, combined with a period of time during which the infection is undetectable, makes it difficult to determine whether infection occurred during delivery or through breastfeeding.
- Late post-natal transmission (after 3-6 months) can be estimated with the PCR test.

- A meta-analysis of five studies concluded that the best available estimate of the risk of breast milk transmission is 14%.
- The risk of HIV transmission through breastfeeding can be calculated for a particular population with the following formula: percentage of HIV-infected mothers at time of delivery multiplied by 14 percent.
- Up to 70% of breast milk samples from HIV-infected mothers have been shown to contain cell-associated and cell-free HIV.
- Transmission is not necessarily a result of the presence of HIV in breast milk, however, but of a complex interaction between the anti-infective agents—macrophages, lymphocytes, and immunoglobulin— in breast milk and HIV.
- Safe alternatives may not be available in some resource-limited settings, (e.g., unsafe or inadequate water supply may be the only sources available for mixing formulas) in which case exclusive breastfeeding for the first six months of life is recommended
- Women who require ART and are breastfeeding should continue their ongoing ART regimen
- Efficacy of potent ART for mother, used solely to prevent postnatal transmission of HIV through breast milk is unknown, but is currently being studied
- HAART has been shown to dramatically reduce the transmission of HIV to the infant

## Possible mechanisms of transmission through breast milk

- One theory to explain the transmission of HIV through breast milk is that M-cells—specialized epithelial cells that comprise only one percent of all epithelial mucosal cells found in the Peyer's patches of intestinal mucosa—engulf the virus and allow it to pass through to the macrophages on the other side.
- The M-cells could facilitate passage through the single layer of cells in the gut that are connected with mostly impermeable junctions.
- Another study showed the HIV-infected cells in the intestinal lumen stimulated enterocytes to engulf HIV particles.
- More research is needed in this area.
- Immunoglobulin (Ig)G was the most frequently identified HIV-specific antibody in breast milk, followed by immunoglobulin (Ig)M.
- The strongest predictor of transmission was HIV infected cells in breast milk and combined with a defective IgM response.

## Anti-HIV activity in breast milk

- Human lactoferrin, with demonstrated inhibitory effects on E. coli and other pathogens, has been shown to ward off HIV.
- Lipid-dependent antiviral activity against HIV and other enveloped viruses and bacteria has also been identified.
- A sulphated protein, glycoprotein mucin or glycosaminoglycan, also appears to inhibit the binding of HIV to CD4 receptors.
- Studies vary greatly on the presence of cell-free and cell-associated virus in colostrum. Some research shows more HIV DNA (cell-associated virus) in colostrum than in breast milk. Other studies indicate higher proportions of infected cells in breast milk than in colostrum.
- Current WHO/UNAIDS/UNICEF guidelines recommend that women with HIV infection be fully informed of both risks and benefits of breastfeeding and be supported in their decision about feeding practices.

## Activity 4: Prevention of Mother to Child Transmission

- PMTCT interventions are most effective when carried out in the context of comprehensive maternal and child health (MCH) services. These include antenatal care, post-natal care, and child health services
- Specific intervention actions include:
- **Essential Nutrition Actions**
  - Nutrition and HIV/AIDS programs, including PMTCT, should be based on a number of key elements, depending on the country context. The Essential Nutrition Actions (ENA) package promotes the seven following key nutrition behaviours that are do-able and scientifically proven to improve the nutrition of women and children:
  - Promotion of optimal breastfeeding during the first 6 months
  - Promotion of appropriate complementary feeding beginning at 6 months with continued breastfeeding to 2 years and beyond
  - Promotion of appropriate feeding of the child during and after illness
  - Prevention of vitamin A deficiency (breastfeeding, consumption of fortified and vitamin A-rich foods, maternal and child supplementation 6- 59 months)
  - Prevention of anaemia (maternal and child iron supplementation, deworming, malaria control, and consumption of fortified and iron-rich foods)
  - Promotion of iodized salt consumption by all families
  - Promotion of improved women's nutrition (increased food intake during pregnancy and lactation, iron and folic acid supplementation, treatment and prevention of malaria, deworming during pregnancy, post-partum vitamin A supplementation)
  - The ENA approach is implemented through health worker counselling and behaviour change communication at six contact points in the life cycle: antenatal, delivery and immediate post-partum, post-natal and family planning, immunization, growth monitoring or well child, and sick child consultations.
  - The ENA package may be implemented within MCH or other ongoing programs.
  - For PMTCT programs, emphasis may be placed on infant feeding and promotion of exclusive breastfeeding depending on the context.
  - The promotion of improved women's nutrition is also important for PMTCT.
  - Consistent with the ENA approach, experience has shown that a full antenatal service package for PMTCT should include VCT, maternal tetanus toxoid immunization, screening and treatment for sexually transmitted infections, iron and folic acid supplementation, malaria preventive intermittent treatment, tuberculosis treatment where appropriate, basic obstetric care, and information on HIV prevention, infant feeding counselling, and family planning.
- **Ensuring good nutrition during pregnancy and lactation**
  - Vitamin A deficiency has been associated with a significant increase of HIV in breast milk and increased mortality of HIV-infected adults.
  - Vitamin A supplementation, however, has not resulted in reduced MTCT.
  - Iron deficiency is associated with low birth weight and prematurity. Both are risk factors of infant HIV infection.
  - One study found that multivitamin supplements resulted in a 44 percent reduction in low birth weight, 39 percent reduction in prematurity, and improved maternal haemoglobin and CD4 counts after delivery.
  - The risks to the HIV-infected breastfeeding mother have been a subject of some debate. A study revealed that the relative risk of death for breastfeeding mothers

compared with formula feeding was 3.2. There was also an association with maternal death and subsequent infant death. A WHO statement (2001) advised that the results of this study pertaining to mortality should be interpreted with caution. However, the study highlights the importance of care and support to the HIV-infected mother.

- Although MCH clinics are an excellent entry point for PMTCT interventions, they do not necessarily reach men.
- Outreach to men and communities should be integral to MCH interventions, so the burden is not only on mother.

➢ **Breastfeeding techniques**

- It is especially important for PMTCT programming that staff members are trained in lactation management skills.
- The risk of cracked nipples may be reduced by improving positioning and attachment (i.e. latching onto the areola rather than nipple).
- The use of abrasive creams and soaps, which may result in cracked nipples, should be discouraged by counsellors and health workers.
- The pain of cracked nipples may cause the mother to avoid emptying her breasts, resulting in engorgement and eventually leading to mastitis.
- Gentle expression techniques may be required to assist the mother with emptying her breasts.
- Role-plays and practical sessions on lactation management are recommended for instructing or reviewing good breastfeeding techniques with students.

➢ **Short-course perinatal ARV prophylaxis**

- Short-course perinatal ARV prophylaxis is to be distinguished from long-term ARV therapy for treating HIV-infected people.
- The former regimens are prescribed to prevent mother-to-transmission of HIV and not to treat the HIV-infected mother.
- The three most common courses are listed below.
  - Administration of Zidovudine (AZT) to women from 36 weeks gestation through labour and delivery, with additional prophylactic AZT to the mother after birth in some regimens.
  - Administration of AZT and Lamivudine (3TC) to mother and baby during the antenatal, intrapartum, and post-partum periods.
  - Administration of Nevirapine (NVP) during labour and to infant within 72 hours of birth. This course is preferred because of the low cost ($4 for mother and child pair) and ease of administration (single dose for mother and newborn).
- Five perinatal antiretroviral therapy (ART) regimens have been tested for breastfed infants.
- Efficacy is reduced over time, likely because trials provided ART only during the perinatal period.
- There are ongoing trials to examine whether ARVs prevent MTCT during breastfeeding.
- A single dose of Nevirapine to mothers during labour and another to her infant after delivery reduced transmission in breastfed infants by 42 percent through 6 weeks and by 35 percent through 12 months.

➢ **Optimal obstetric care**

- Safe motherhood and reproductive health programs are advised for PMTCT programs.

- It is important to support safer labour and delivery practices in the context of HIV/AIDS. Women should be encouraged to walk during labour, to stay well nourished and hydrated, and to have a safe delivery plan and a contingency plan for referral.
- Partographs are recommended to record labour progress and mother-baby vital signs.
- Artificial rupture of membranes to hasten labour should be avoided, as well as routine episiotomy for all primagravidas.
- Following delivery, the baby should be thoroughly dried, and any remaining maternal blood and amniotic fluid should be removed.
- Vigorous suctioning of the infant's mouth and pharynx right after delivery should be avoided, and cutting and care of umbilical cord should be carefully handled.
- Elective Caesarean sections are used for prevention of MTCT but may be risky in certain environments.

### ➢ Family planning

- The contraceptive prevalence rate in sub-Saharan Africa remains low at 17 percent (UNICEF 2000).
- Available safe and effective contraception as well as quality reproductive health counselling for PMTCT programs are important.
- There are presently studies for the development of a microbicide that can be an effective contraceptive while preventing STIs and HIV infection in women

### Nursing Management Strategies

#### Antenatal Care

- Most HIV infected women will be asymptomatic
- Watch for signs/symptoms of AIDS and pregnancy-related complications
- Unless complication developes, no need to increase number of visits.
- Tests STIs and other co-infections
- Counsel against unprotected intercourse
- Avoid invasive procedures and external cephalic version
- Give antiretroviral agents
- Counsel about nutrition

### ➢ Summary

- The future of PMTCT depends on programmers, policymakers, and researchers. While successful programs are now being implemented, an even greater investment is needed to address this problem with particular emphasis on infant feeding.
- At the policy level, many governments have developed national guidelines on PMTCT. There is a need to share experiences among countries and ensure that guidelines are based on current research findings and programmatic experience.
- Finally, further research is needed on PMTCT.
- An ideal PMTCT regimen would be feasible, safe, and effective
- In theory, an HIV-negative generation can happen if PMTCT is effective

## Activity 5: Group work

Counseling sessions on infant feeding options

# Module 14

# Theme: Emerging Special Circumstances

## Goal

Participants will appreciate the enormity of the challenges posed by special circumstances in the management of HIV/AIDS.

## Objective

1. Acquire knowledge on some emerging special circumstances.
2. Discuss their impact on clinical management of HIV/AIDS.
3. Develop strategies for management.

## Content

Emerging special circumstances:

- Co-infection with Hepatitis B and or C
- Immune reconstitution syndrome
- Infertile couple with HIV and the discordant couple
- Nursing role in the management of these special circumstances
- HIV and the adolescent
- Pediatrics and HIV infection

## Methodology

- Lecture/Discussions
- Film show
- Graphics

## Material needed

- Overhead projector
- Data/Multi-media projector
- Transparencies
- Flip-chart & flip-chart stand
- Markers (coloured)
- Masking tape
- Lap top
- Diskettes/other media storage devices

## Activity 1: Co-infection with hepatitis B and/or C

The relationship between HIV-1 and Hepatitis B and or C will be discussed as well as the implication and challenges to HIV-1 management.

*Time: 20 minutes*

## Activity 2: Immune reconstitution syndrome

The facilitator will discuss immune reconstitution syndrome and its relationship with HIV infection, also the clinical features and implications for drug treatment.

*Time: 20 minutes*

## Activity 3: Infertility, sero-discordant couples and HIV infection

Participants will appreciate the challenges and implications of HIV/AIDS and reproduction. Counselling and appropriate management strategies for these individuals will be discussed.

*Time: 20 minutes*

## Activity 4: HIV/AIDS and the adolescent

During this session the reasons why adolescents are at risk of HIV/AIDS, the long term health consequences of HIV infection in adolescents and strategies for preventing HIV infection in adolescents will be discussed.

*Time: 20 minutes*

## Activity 5: Pediatrics and HIV infection

This session will highlight the various factors that affect and increase the risk of HIV infection in children. It will also discuss the necessary health care interventions for infants and children infected and affected with HIV/AIDS. In addition, graphic illustrations on the impact of HIV/AIDS on orphans and vulnerable children will be presented with some discussion focusing on identifying strategies to assist children, orphaned by HIV/AIDS and those vulnerable to HIV infection.

*Time: 30 minutes*

## Activity 6: Group work

# Lecturer/Facilitator's notes

## Introduction

The Facilitator will introduce the objectives of the module, explain why special issues in ARV therapy needs to be understood because participants would encounter such special cases in the course of patients' management, and would need to take actions on these cases. The unique circumstances of women and children are also issues to be considered. Questions would be addressed at the end of each session. The Facilitator can then introduce resource person

*Time: 5 minutes*

## Activity 1: Co-infection with hepatitis B and/or C

- Liver toxicity is a growing problem among HIV-1 patients, in particular in those who have been on HAART for many years and among those who are co-infected with hepatitis C or hepatitis B.
- Physicians and patients need to be vigilant about monitoring potential symptoms of liver disease and/or drug-related effects on the liver.
- Although the introduction of highly active antiretroviral therapy (HAART) led to a sharp drop in immunodeficiency-related opportunistic infections (including hepatobiliary ones), short- and long-term toxicity of each antiretroviral agent and their combination may add its effect to the frequently underlying chronic hepatitis B virus (HBV) and/or hepatitis C virus (HCV) infection, and their specific antiviral treatment .
- Following the introduction of HAART as the standard of care of HIV-1 disease, multiple pathogenic mechanisms have been postulated for the emerging liver damage observed during the course of antiretroviral therapy.
- A direct or immune-mediated hepatic involvement seems to be caused by nonnucleoside reverse transcriptase inhibitors. The administration of nucleoside analogues acts via mitochondrial abnormalities prompting hepatosteatosis, lactic acidosis, and muscle and bone toxicity. Protease inhibitors seem to be the main causes of glucose and lipid abnormalities, which also involve extensive liver metabolic pathways, as demonstrated by an increased tendency to develop abnormal liver enzymes in patients on protease inhibitor-based HAART, compared with controls without a viral hepatitis co-infection.
- Moreover, the rapid immune recovery as a result of HAART may prompt an initial increased production of proinflammatory cytokines, which can lead to a flare-up of a concurrent viral hepatitis, especially in patients who initiated HAART when their immunodeficiency was severe.
- A surprising, significant improvement of liver enzymes has been described during HIV-HCV co-infection, apparently due to the HAART administration.
- In countries where an HIV-viral hepatitis co-infection is common, due to the prevalence of injecting drug use, more than 50-60% of HIV-infected patients have a concurrent chronic hepatitis. This is characterized by a slow but progressive evolution until recent years, when effective treatments became available for HIV-1 co-infected patients.
- In recent years both morbidity and mortality due to complications of chronic hepatic disease (i.e., liver cirrhosis and hepatocarcinoma), have overcome those of HIV-related complications, as demonstrated by several epidemiological studies. However other studies have failed to confirm this phenomenon.

- Novel and potent pharmacological regimens are now available for an effective treatment of HBV and/or HCV infection, with ribavirin, amantadine, lamivudine, and tenofovir joining new interferon formulations as the standard of care of these chronic infections.
- However, the extensive and prolonged use of these drugs have potential interactions with other compounds commonly administered for the management of HIV disease, and may result in liver toxicity.
- When HIV disease is associated with a viral hepatitis, other pharmacological treatments are needed concurrently and if substance abuse is still present (alcohol, heroin, and methadone), the risk of increased drug-drug interactions (lift to antimicrobial agents, cardiovascular, gastrointestinal, central nervous system drugs, antineoplastic regimens, anticoagulants, and non-steroidal anti-inflammatory drugs) and end-organ toxicity is increased significantly. This is as a result of the central role of liver tissue in drug metabolism.
- The discontinuation of lamivudine, emtracitabine and/or tenofovir has proved a particular risk factor in HBV co-infected subjects, as each drug suppresses HBV viral replication and when discontinued, may result in a severe flare of the liver disease.
- Patients treated with nevirapine and efavirenz containing regimens have been shown to have higher frequency of laboratory hepatotoxicity than in patients with concurrent HCV and HBV disease, and higher baseline transaminase levels.
- The concomitant administration of protease inhibitors seemed to increase the risk of liver toxicity.
- The nevirapine-associated liver toxicity seems to be related to elevated plasma levels of the drug, and this is worsened by co-infection with HCV disease
- Strict monitoring should be in place for hepatic toxicity, which can parallel allergic rash such that an increase in liver enzymes may not represent a long-term toxicity that is easily recognized by the standard laboratory examinations usually performed in HIV-infected patients.
- In conclusion, the clinical and therapeutic tasks of clinicians caring for patients with both HIV infection and viral hepatitis are becoming more and more difficult. Starting from a complete knowledge of pharmacokinetic and pharmacodynamic interactions among all involved drugs, and between pharmacotherapy and an altered metabolism, careful attention has to be paid to ensure optimal treatment for chronic viral diseases (HIV, HBV, and HCV) in order to keep morbidity and mortality as low as possible.

## Activity 2: Immune reconstitution syndrome

- Immune reconstitution with effective potent antiretroviral therapy in the clinical setting is evidenced by the reduction in mortality and opportunistic conditions since the advent of the potent therapy era.
- A number of mechanisms may account for the immune reconstitution underlying the observed clinical benefit.
- Some portion of immune reconstitution is likely to be attributable to a reduction in the high degree of immune activation associated with HIV infection. Activation markers predictive of disease progression are detected on CD4 and CD8 cells from HIV infected patients. Levels of these markers decline soon after initiation of potent therapy, frequently returning to near-normal levels.
- The high T-cell turnover rate characteristic of HIV infection also resolves after initiation of potent therapy.

- Furthermore, initiation of potent therapy is associated with improvement in the numerous abnormalities in cytokine profiles that have been observed in HIV-1 infection.
- Although some degree of immune reconstitution may thus be attributable to resolution of such HIV related derangements in immune activity with initiation of potent therapy, the major improvements are likely associated with the increases in numbers of circulating CD4 cells and restoration of pathogen-specific immune function
- Evidence of restored pathogen-specific response has been provided by a number of studies
- Evidence of pathogen-specific immune restoration has also come from use of sensitive quantitative assays that permit individual identification of pathogen specific CD4 cells and cytotoxic T (CD8) lymphocytes (CTLs) using flowcytometry
- The consequences of immune restoration are not always beneficial. The immune reconstitution inflammatory syndrome, an acute localized or diffuse inflammatory response that probably reflects the rapid return of pathogen-specific immunity in the setting of a large pathogen load, has now been observed in many patients receiving potent therapy
- The inflammatory syndrome was observed with several different pathogens, consisting of recrudescence of HSV, herpes zoster, CMV retinitis, MAC, acute hepatitis C virus, and *M. tuberculosis* lymphadenitis/pneumonitis or cerebritis.
- A low baseline CD4 cell count is a strong predictor of inflammatory syndrome.
- The characteristic response to initiation of potent therapy is a rapid increase in CD4 cell count followed by a more gradual rise
- Most of the initial increase consists of an increase in memory CD4 cells, with this population exhibiting a skewed receptor repertoire that reflects the repertoire present before the initiation of therapy
- Most of the subsequent gradual increase is accounted for by increases in naïve CD4 cells, which are projected to account for the vast majority of the overall increase in CD4 cell count over time
- Since pathology studies have demonstrated that functional areas of the thymus are largely replaced by adipose tissue in adulthood, it was initially believed that the increase in naive cells resulted from peripheral expansion of the existing cells and did not reflect de novo thymic production
- Because T-cell specificities lost during cell depletion in HIV infection are not replaced by peripheral expansion of existing cells, immune deficits might remain even with an increase in naive CD4+ T-cell numbers.

## Activity 3: Infertility, sero-discordant couples and HIV infection

- The only completely effective means of not communicating HIV from the infected partner to the uninfected partner has been total abstinence—avoiding all sexual contact.
- While for some couples this has been an effective means of countering the risk, for many others, their desire to participate in sexual activity with each other has made it difficult to avoid the risk.
- Study show that people with a viral load of less than 1,500 copies per milliliter seemed never to transmit HIV to their partners; however, as viral loads increased, HIV was passed on through sexual relations. The lesson here seems to be that keeping the viral load to low or undetectable levels is the key to keeping an uninfected partner healthy

- The viral load of an HIV-positive partner is the most important factor affecting heterosexual transmission of the virus. Among 415 sero-discordant couples identified in a population-based study in Uganda, transmission rates increased with the number of copies of HIV ribonucleic acid (RNA) in the blood, from two sero-conversions per 100 person-years when the infected partner had fewer than 3,500 copies per millilitre to 23 per 100 person-years when the partner had at least 50,000 copies per millilitre. No sero-conversions occurred when the HIV-positive partner's viral load was less than 1,500 copies per millilitre.
- One of the most frequently asked questions is: What is the effectiveness of condoms in preventing HIV transmission? The simple answer is that they are somewhat effective. Studies show that the probability of HIV transmission when the infected partner's viral load is above 1,500 is between 11 and 20 percent during any twelve-month period, even with the use of a condom. Total compliance to a working HAART program that keeps viral load to undetectable levels would decrease the risk.
- When counselling an HIV-sero-discordant couple, the first thing you need to tell them is that HIV still has no cure. This disease will eventually result in death for the person who has it.
- Recent advances in medical intervention have almost rendered HIV chronic and manageable; however, there are still many side effects to the drugs that are used in the HAART therapy, and strict compliance with the dosing regimen is essential in order to maintain viral load reduction.
- Also, sero-discordant couples need to be counselled that there will always be some degree of risk attached with sexual activity and HIV. Condom failure, missed medicines, illness, and many other factors may increase the risk of obtaining HIV from an infected sexual partner. It is up to each couple to decide if that risk is at an acceptable level for both of them before they proceed with sexual activity.
- However, the future for sero-discordant couples is brighter than it has been in a long time. Currently, they are able to, in many cases, have children, enjoy each other's company, and have a certain level of sexual contact. Everyone who has access to the HAART drugs is living a longer life than ever before possible with HIV infection.
- The wise counsellor will educate the HIV-sero-discordant couple just the same as they would regard the options of abortion and adoption or carrying a baby to term. The counsellor should also stress to the HIV-sero-discordant couple the need for fidelity and inform those who are HIV negative that the possibility of getting HIV increases proportionally with the number of sexual contacts.

## What to do when one partner is HIV-positive and the other is HIV-negative

- There is still controversy over the best advice to give to sero-discordant couples.
- It is usually unwise for sero-discordant couples to have unsafe sex. Even when politely called a “conception attempt”, there is always a risk to the HIV-negative partner of contracting HIV.
- For an HIV negative woman, for example, the chance of becoming HIV-positive from having unprotected sex will depend on many things, including the viral load in the semen of her male partner.
- An undetectable viral load result from a blood test does not mean that viral load is undetectable in seminal fluid.
- For an HIV-negative man, transmission risk depends on the level of viral load in the genital fluids of his female partner. Again, an undetectable viral load in blood does not always mean the same as in genital fluid.

- Other factors are also important. An uncircumcised man may be more at risk of contracting HIV because cells in the foreskin are more vulnerable to infection. And having sex with an uncircumcised HIV positive man is of greater risk to an HIV-negative woman than sex with a circumcised man.
- Infections of the genital tract also increase the risk of sexual transmission of HIV. Regardless of the method of conception, both members of a sero-discordant couple should check for such infections. This should include screening and treatment for other sexually transmitted infections.
- The man should have a semen analysis. This can rule out any infection and also to ensure that his sperm count is fit and healthy.
- All these risk factors aside, HIV is actually quite a difficult virus to transmit. Statistically it is much harder to transmit HIV than to get pregnant. Therefore, limited conception attempts made during ovulation may carry a low risk if the positive partner has undetectable levels of viral load. But there is still a risk involved for both male and female negative partners from any single unprotected exposure. After all, people can conceive from one attempt and also become HIV-positive from one exposure.
- In one study of HIV negative women and HIV-positive men, 4% of women became HIV positive. Most would consider this an unacceptable risk.
- One additional point should be stressed. Although a low number of conception attempts can be relatively safe, some couples do not return to safer sex afterwards. This often results in the negative partner then becoming HIV-positive.
- It is important to highlight that HIV is still a disease that can affect the rest of your life. If a partner has stayed HIV-negative until now, one might not want to change this over a decision to have a baby.
- For those who wish to conceive, there are other options that involve almost no risk to the negative partner. These options are discussed below.

    - When the man is HIV-positive and the woman is HIV-negative you can use a process called sperm washing.

        - This involves the man giving a semen sample to the clinic. A special machine then spins this sample to separate the sperm cells from the seminal fluid.
        - Only the seminal fluid contains HIV-infected white blood cells. And these cells carry the risk of passing on HIV. Sperm cells themselves do not contain infectious HIV.
        - The washed sperm is then tested for HIV. Finally, a catheter is used to inject the sperm into the woman's uterus. In vitro fertilization (IVF) may also be used. IVF is important if the man has a low sperm count.
        - An Italian doctor first developed this process. His clinic has used the process for over 3,000 samples of sperm washing.
        - There have been no cases of HIV transmission to women from sperm washing.
        - It has also led to the birth of over 600 HIV-negative babies. This is therefore the safest way for an HIV-negative woman to become pregnant from an HV-positive man.
        - Very few clinics offer sperm washing in the UK. The clinic with the most experience is the Chelsea and Westminster Hospital in London.
        - Cost is a barrier for many to these services and health authorities must address this issue

- When the woman is HIV-positive and the man is HIV-negative

- The options are usually much simpler in this situation.
- Do-it-yourself artificial insemination or "self insemination" using a plastic syringe carries no risk to the man. This is the safest way to protect the man from HIV.
- Around the time of ovulation, one puts the sperm of the partner as high as possible into the vagina.
- Different clinics may recommend different methods. One way is to have protected intercourse with a spermicide-free condom. Another is for the partner to ejaculate into a container. In both cases, the sperm is inserted into the vagina with a syringe.
- The clinic can provide the container and syringe and detailed instructions on how to do this, including advice on timing the process to coincide with your ovulation for couples interested in self insemination.

## Activity 4: HIV/AIDS and the adolescent

- The AIDS epidemic among adolescents and young adults continues to be an increasing concern. The Centers for Disease Control and Prevention (CDC) reported 41,287 cumulative cases of AIDS among people ages 13 through 24 through December 2002. Health experts estimate the number living with HIV (human immunodeficiency virus) infection to be much higher.
- Because the average duration from HIV infection to the development of AIDS is 10 years, most adults with AIDS were likely infected as adolescents or young adults. HIV infection is the seventh leading cause of death for those ages13 through 24.
- Most HIV-infected adolescents and young adults are exposed to the virus through sexual intercourse.
- Approximately 25 percent of cases of sexually transmitted infections (STIs) reported are among teenagers. This is particularly significant because the risk of HIV transmission increases substantially if either partner is infected with an STI. Discharge of pus and mucus as a result of STIs such as gonorrhea or chlamydia infection also increase the risk of HIV transmission three- to five-fold. Likewise, STI-induced ulcers from syphilis or genital herpes increase the risk of HIV transmission nine-fold.
- Adolescents and young adults tend to think they are invincible, and therefore, deny any risk. This belief may cause them to engage in risky behaviour, delay HIV testing, and if they test positive, delay or refuse treatment.
- Many young people, when they learn they are HIV-positive, take several months to accept their diagnosis and return for treatment. Health care providers may be able to help these adolescents and young adults understand their situation during visits by
  - Ensuring confidentiality
  - Explaining the information clearly
  - Eliciting questions
  - Emphasizing the success of newly available treatments

- Most adolescents with sexually acquired HIV are in a relatively early stage of infection
- and are ideal candidates for early intervention that includes education and counselling, identifying high-risk behaviours, and recommended therapies and behavioural changes.

- Adolescents who were infected at birth or via blood products as young children follow a unique clinical course that may differ from that of other adolescents and adults. Health care providers should refer to the treatment guidelines for detailed information about the treatment of HIV-infected adolescents.

## Activity 5: Paediatrics and HIV Infection

- Data on the efficacy and tolerability of antiretrovirals in children are limited
- However, antiretroviral options are often limited in young children as only some of the antiretrovirals are available as paediatric formulations.
- All antiretrovirals have been associated with toxicities in children, but in general, they are relatively well tolerated.
- The gastrointestinal system including hepatic system is most prone to being affected by these drugs.
- Skin rashes and hypersensitivity reactions are also associated with antiretroviral use, particularly with the non-nucleoside reverse transcriptase inhibitors.
- Mitochondrial toxicities that lead to impairment of liver function, pancreatic function and lactic acidosis are associated with most of the nucleoside analogues.
- Haematological toxicity is often a dose limiting adverse effect especially of the nucleoside analogues, in particular zidovudine.
- The protease inhibitors are associated with gastrointestinal intolerance (diarrhoea) and metabolic derangements that can lead to hypercholesterolaemia and hypertriglyceridaemia, which in turn and can lead to changes in body habitus.
- The renal system is also affected by several drugs, the most important of which is indinavir, which has been associated with renal stones and damage to the renal tubules.
- Fortunately, with lower incidence of major toxicity and with the range of drugs now available for paediatric use, toxicities are usually not a barrier to effective antiretroviral therapy in children.
- The same principles of antiretroviral therapy apply to HIV-infected children and adolescents. The treatment of HIV-infected children, however, involves unique pharmacologic, virologic, and immunologic considerations
- The goals of therapy in children are:
  - Promote or restore normal growth and development
  - Prevent complicating infections and cancers
  - Improve quality of life
  - Prolong survival
- Paediatric antiretroviral formulas come in form of suspensions, tablets, capsules, powder or intravenous formulations. The liquid may be flavoured.
- The ideal combination of antiretroviral therapy consists of 3 drugs minimum of which 2 NRTIs form the backbone. The 3rd drug may either be a protease inhibitor or an NNRTI.
- Adherence to treatment is also a major issue in children. Children depend on caregivers for administration or supervision of administration Medications are not always available in palatable liquids or mixable formulations for infants/young children. Adherence is affected by a number of factors. These include;
  - Parental factors eg misunderstanding/Misinformation to parents, cultural beliefs, secrecy, stigma, shame

- Children factors such as taste, child refusal

- There is a need to facilitate adherence to ART. These include:
  - Family-Focused Adherence Support
  - Provider-Focused Support

## Child-Focused Strategies
## Children orphaned by AIDS

- Approximately 8.2 million children around the world have been orphaned by the
- HIV/AIDS epidemic. AIDS orphans, defined as children who have lost their mother or both parents to AIDS before reaching the age of 15, are predicted to number 41 million worldwide by 2010. Nine out of ten (90%) maternal orphans are presently living in sub Saharan Africa. The extended family system, which would traditionally provide support for orphans, is greatly strained in communities most affected by AIDS. This is especially true in populations which migrate.
- Nurses and midwives can play an important role in orphan care. This care could include direct physical care, being an advocate on behalf of the child, and helping to influence policy changes to respect the rights and dignity of children.
- When children are cared for by other family members, this places an added financial burden on these care givers. After their parent's death, children can lose their rights to the family land or house. Without education, work skills or family support, children may end up living on the streets.
- These children are especially vulnerable, often becoming sexually active at an early age and at risk from HIV themselves.
- Poverty is an overwhelming problem. These orphans not only lack money, but basics such as clean water, drugs, food, shelter and medical supplies.
- They do not have information about how to protect themselves, and have poor access to doctors, nurses, and other health care workers and facilities.
- Finally, these orphans often lack human rights and dignity. The magnitude of this problem will have to be addressed at international, national, local, and community levels. Government, non-governmental organizations (NGO) and other institutions and organizations will have to combine their efforts to provide effective programs and strategies to care for orphaned children.
- Nurses and midwives can play an important role in orphan care. This care could include direct physical care, being an advocate on behalf of the child, and helping to influence policy changes to respect the rights and dignity of children

## Strategies for the care of orphaned children

Strategies for the care of orphaned children include the following, in order of preference:

- The extended family: Every reasonable attempt must be made to trace relatives.
- Substitute or foster care families: Placement with non-relative family units after careful caregiver selection, or foster care on an informal basis, recognizing traditional norms and values.
- Family type group: Paid foster mothers living together with small groups of orphans or similar arrangements.

- Child-headed households: Adolescents caring for younger siblings with the support of the community.
- Orphanages: As a last resort when all other options are inappropriate or unavailable. However, there is a limited role for orphanages, for example, in caring for abandoned babies or for very young children needing care until alternative solutions can be found for them

## Activity 6: Group work

Film show on emerging special circumstances