

SESSION 5: MANAGEMENT OF NUTRITION IMPLICATIONS OF HIV AND AIDS THERAPY

Purpose (slide 2)

The purpose of this session is to provide nursing and midwifery students with information about the nutrition implications of drugs used in HIV therapy and the effective management of these implications to support more successful HIV and AIDS therapy and provide higher quality care and support to people living with HIV (PLHIV).

Learning objectives (slide 3)

By the end of the session, students will be able to:

- Explain why nutrition management of drug and food interactions is important in HIV and AIDS therapy;
- Cite the common drugs taken by PLHIV, drug-food interactions, nutrition implications, and appropriate dietary responses.
- Describe approaches to help PLHIV identify and implement appropriate actions to promote response to treatment and manage nutrition implications.

Prerequisite knowledge

- Knowledge of basic nutrition (Session 1)
- Knowledge of basic facts about HIV and AIDS (Session 2).
- Knowledge of nutrition management of HIV symptoms (Session 4).
- Basic knowledge of antiretroviral drugs (ARVs) and other drugs commonly taken by PLHIV.
- Basic counseling skills.

Estimated time: 120 minutes

Session guide (slide 4)

Content	Methodology	Activities	Estimated time (minutes)
Rationale for addressing nutrition implications of HIV and AIDS therapies	Participatory lecture	Review the reason to address nutrition implications of HIV and AIDS therapies.	10
Overview of HIV and AIDS therapies: modern medications and traditional therapies	Participatory lecture	Present modern and traditional HIV and AIDS therapies.	15
Drug-food interactions and their dietary management	Participatory lecture	Review interactions between common ARVs and food and dietary management of nutrition implications of ARVs.	10
Common HIV and AIDS therapies, dietary recommendations, and side effects	Participatory lecture	Review drug side effects that affect food intake or nutrient absorption and their management.	20
Managing nutrition implications of HIV and AIDS therapies	Group activity	Review interactions of common ARVs and food and approaches to managing each interaction.	20
Client assessment	Small group discussion	Facilitate a question and answer session on nutrition implications and management of the ARV Isoniazid.	15
	Role-play	Facilitate a counseling role-play on managing drug-food interactions using the case study in Handout 5.3 and class discussion.	20
Conclusions			5
Review			5
Total time			120

Required materials

- Flipchart paper and stand
- Writing pens
- Blackboard and chalk or whiteboard and markers
- Overhead projector or LCD projector

Materials provided

- PowerPoint 5
- **Handout 5.1. Common Drugs Taken by PLHIV, Likely Side Effects, and Recommended Dietary Practices to Increase Drug Efficacy**
- **Handout 5.2. Observation Checklist for Counseling on Management of Drug-Food Interactions**

Preparation

1. Review Lecture Notes and PowerPoint 5.
2. Be familiar with related content and identify questions to facilitate discussion.
3. Review handouts and exercises to identify questions that can help students master the concepts.

Suggested reading

Attawell, K. and J. Mundy. 2003. Provision of Antiretroviral Therapy in Resource-Limited Settings: A Review of Experience up to August 2003. Health Systems Resource Centre. London: UK Department of International Development (DfID) and Geneva: World Health Organization (WHO).

Castleman, T., E. Seumo, and B. Cogill. 2004. Food and Nutrition Implications of Antiretroviral Therapy in Resource Limited Settings. Washington, DC: Food and Nutrition Technical Assistance (FANTA) Project, Academy for Educational Development.

Lourenco, P. 2001. Enteral Feeding: Drug/Nutrient Interaction. *Clinical Nutrition* 20(2): 187–93.

Nerad, J., M. Romeyn, E. Silverman, J. Allen-Reid, D. Dietrich, J. Merchant, V. Pelletier, D. Tinnerello, and M. Fenton. 2003. General Nutrition Management in Patients Infected with Human Immunodeficiency Virus. *Clinical Infectious Diseases* 36.

Pronsky, Z. M., S. A. Meyer, and C. Fields-Gardner. 2001. HIV Medications, Food Interactions (and So Much More). 2nd edition. Birchrunville, PA: Food-Medication Interactions.

Raiten, D., S. Grinspoon, and S. Arpadi. 2005. Nutritional Considerations in the Use of ART in Resource-Limited Settings. Nutrition and HIV/AIDS in Africa: Durban, South Africa, April 10-13, 2005.

Regional Centre for Quality of Health Care. 2004. Food and Nutrition Counseling for PLWHA on Antiretroviral Therapy. Kampala, Uganda.

Tawfik, Y., S. Kinoti, and C. Blain. 2002. Introducing Antiretroviral Therapy (ART) on a Large Scale: Hope and Caution. Washington, DC: Academy for Educational Development.

World Health Organization (WHO). 2006. Antiretroviral Therapy for Adolescents and Adults in Resource-Limited Settings: Towards Universal Access. Recommendations for a Public Health Approach. Geneva.

Related terms

Drug efficacy – The ability of a drug to carry out its function, i.e., to control or cure an illness.

Non-adherence – Not taking the full course of a prescribed medication or not following medication schedules, doses, or other directions

Nutrient utilization – The absorption, metabolism, distribution, and excretion of nutrients in the body

Opportunistic infection (OI) – An infection that takes advantage of weakness in the immune system. Pneumonia and Kaposi's sarcoma are the more common OIs in the United States and United Kingdom, while tuberculosis and persistent diarrhea are the more common conditions associated with HIV in some parts of Africa.

Introduction (slide 5)

PLHIV take medications to treat HIV and OIs caused by HIV, reduce symptoms, and treat other diseases such as malaria, tuberculosis, and intestinal parasites. Medical treatment can slow the progress of HIV, reduce OIs, and ease symptoms. By reducing viral loads, antiretroviral therapy (ART) can help improve nutritional status. Drugs can also interact with certain foods and nutrients, affecting the drugs' efficacy and clients' adherence to the drugs. Interactions between drugs and food and nutrients can also affect nutritional status negatively by reducing food intake or nutrient utilization, which may lead to weight loss and undernutrition. Side effects of medications can affect food intake and nutrient absorption and can also reduce adherence to medications. Proper nutrition management of side effects can help minimize these effects and improve adherence to treatment. Ultimately, interactions between drugs and food and nutrients can result in poorer health and nutritional status if they are not addressed.

To ensure successful ART, nurses and other service providers should help clients understand the food and nutrition implications of the drugs they are taking and help them identify and implement appropriate responses.

Overview of HIV and AIDS therapies in resource-constrained settings (slide 6)

PLHIV may use both modern and traditional therapies to treat HIV and OIs and alleviate symptoms.

Modern medications

ARVs significantly reduce the replication of HIV in the body and slow progression of the disease. The main types of ARVs used in sub-Saharan Africa are non-nucleoside reverse transcriptase inhibitors (NNRTI), nucleoside/nucleotide analogue reverse transcriptase inhibitors (NRTI), and protease inhibitors (PI). Table 1 lists these types of ARVs with examples.

Table 1. Major types of ARVs

Type	Examples of drugs
Non-nucleoside reverse transcriptase inhibitor (NNRTI)	Efavirenz, Nevirapine
Nucleoside/nucleotide reverse transcriptase inhibitor (NRTI)	Abacavir, Didanosine, Lamivudine, Stavudine, Tenofovir, Zidovudine
Protease Inhibitor (PI)	Indinavir, Lopinavir, Nelfinavir Ritonavir, Saquinavir

Sources: WHO 2003 and Castleman et al 2004.

Each type of ARV is active at different stages of viral replication. Multiple ARVs are combined to enhance their efficacy in suppressing viral replication. This is referred to as combination therapy or highly active antiretroviral therapy (HAART). During combination therapy, one medication acts in combination with another to treat HIV. The four first-line ARV combinations recommended by WHO for resource-limited settings are 1) Stavudine, Lamivudine, and Nevirapine, 2) Zidovudine, Lamivudine, and Nevirapine, 3)

Stavudine, Lamivudine, and Efavirenz, and 4) Zidovudine, Lamivudine, and Efavirenz (WHO 2003).

Other types of drugs taken by PLHIV are listed below.

- **Antifungal drugs** such as Nystatin and Nizoral to treat thrush
- **Antibiotics** such as Rifampin and Cotrimoxazole to treat bacterial infections
- **Antimalarial drugs** such as quinine and pyrimethamine to treat malaria in endemic regions
- **Anthelmintic drugs** such as Ivermectin and Provacina to treat intestinal parasites and worms
- **Dietary supplements** such as iron and vitamins A, B, and E to treat nutrition deficiencies

Traditional therapies

PLHIV commonly used traditional therapies such as herbs, teas, and infusions to alleviate symptoms and increase their sense of hope and control over their health problems. Traditional therapies vary from one place to another, and the efficacy of most traditional therapies has not been well documented.

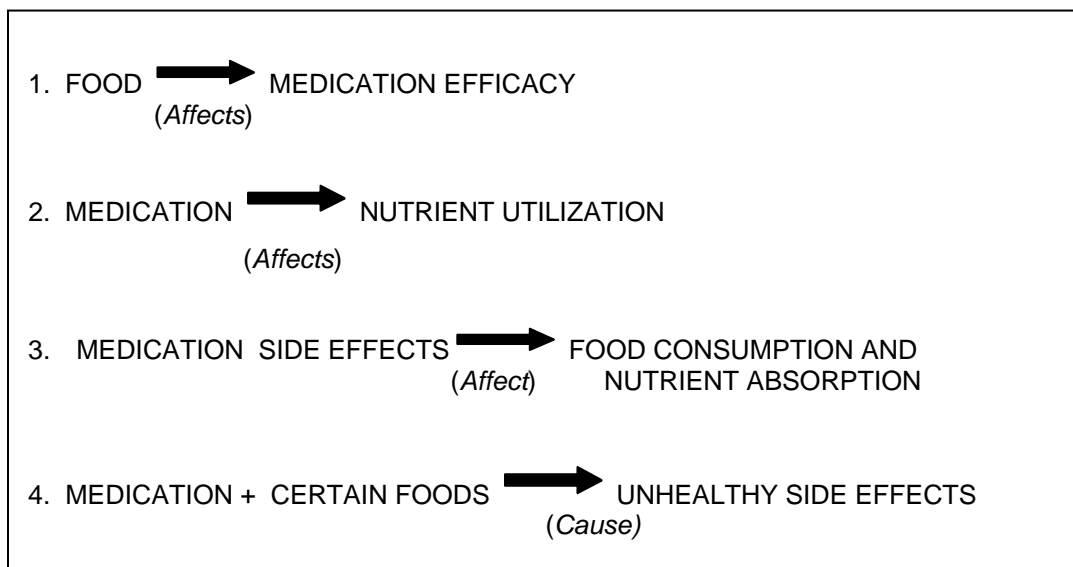
This session focuses primarily on modern medications, but traditional medications can also interact with certain foods or other drugs and can also have side effects. To the extent possible, nurses and other service providers should use the same principles and approaches as for ARV-food interactions to help PLHIV understand and manage interactions between traditional medications and food and avoid any known negative interactions between traditional and modern medications.

Drug-food interactions and their dietary management (slide 7)

The main kinds of interactions between drugs and food and nutrition are listed below and in figure 1.

1. Food can affect drug efficacy.
2. Drugs can affect nutrient utilization.
3. Drug side effects can affect food intake or nutrient absorption.
4. The combination of certain drugs and foods can create unhealthy side effects.

Figure 1. Types of drug-food interactions



Source: Adapted from Castleman et al 2004.

1. Food can affect drug efficacy. (slide 8)

Some foods can enhance or inhibit the absorption, metabolism, distribution, or excretion of certain drugs. Whether and how food will affect drug efficacy varies from one drug to another. Dietary responses to optimize drug efficacy should be based on the specific interactions of the drugs taken. Dietary responses to improve the efficacy of a drug may include taking the drug with food, on an empty stomach, or with or without certain types of foods.

Examples of how food intake affects drug efficacy are listed below.

- Food reduces the rate of absorption of aspirin (acetylsalicylic acid), commonly used to treat fever and pain. 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. Isoniazid should be taken 1 hour before or 2 hours after meals.
- Food also reduces the absorption of Rifampin, another medication commonly used to treat tuberculosis. Rifampin should be taken 1 or 2 hours after meals to increase its 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 (Pronsky, Meyer, and Fields-Gardner 2001). A high-calorie, high-fat, high-protein meal decreases the absorption of the nucleoside reverse transcriptase inhibitor Zidovudine. It is therefore recommended not to take Zidovudine with high-fat meals (> 40 g of fat).

Nurses can help clients draw up food-drug timetables based on the known effects of food on the drugs clients are taking. This timetable should take into account other food-drug interactions of each drug taken and the client's eating habits.

2. **Drugs can affect nutrient utilization.** (slide 9)

Certain drugs affect nutrient absorption, metabolism, distribution, or excretion. Drugs that inhibit or enhance nutrient utilization 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 nutrient intake if the metabolite produced can affect health negatively.

Drugs that may require increased food or nutrient intake

- The tuberculosis medication Isoniazid inhibits the metabolism of vitamin B₆. Supplementation of vitamin B₆ is therefore recommended for people taking Isoniazid.
- The antibiotic and tuberculosis medication Rifampin may increase vitamin D metabolism. Supplementation of vitamin D may be needed.

Studies have reported lipid (or fat) abnormalities, including elevated levels of triglycerides, cholesterol, and fat maldistribution, in people who take certain ARVs.

Drugs that may require reduced food or nutrient intake

- The PIs Saquinavir and Ritonavir may cause elevated cholesterol and triglyceride levels, which may increase the risk of cardiovascular (heart) diseases (Pronsky et al 2001).

Changes in lipid levels may require both dietary and medical responses. To lower triglycerides, PLHIV should maintain a healthy weight, eat a variety of foods, reduce their intake of refined sugar and excessive carbohydrates, increase their intake of fiber, avoid alcohol, exercise daily, and take medication if needed. To reduce cholesterol, PLHIV should maintain a healthy weight, eat a diet low in fat and limited saturated fat, increase intake of fruits and vegetables, limit foods rich in cholesterol, avoid alcohol and smoking, exercise daily, and take medication if needed (Pronsky et al 2001).

The effective management of fat maldistribution (or lipodystrophy syndrome) has not yet been established. Diet and exercise, use of medications, and a change in the ARV regimen may help.

Some ARVs may affect glucose metabolism and cause insulin resistance. Insulin resistance is associated with increased risk of diabetes (Gelato 2003). For diabetes, reduced intake of refined sugar and saturated fat, a specific carbohydrate controlled diet, exercise, and anti-diabetic medications are recommended.

3. **Drug side effects can affect food intake or nutrient absorption.** (slide 9)

Both modern and traditional medications can cause side effects that negatively affect food intake and nutrient absorption. Side effects such as changes in taste, loss of appetite (anorexia), nausea, bloating and heartburn, and constipation may lead to reduced food intake, and vomiting and diarrhoea can cause poor nutrient absorption. Reduced food intake and poor nutrient absorption can contribute to weight loss, malnutrition, and wasting.

Side effects also can contribute to non-adherence to a drug regimen. Non-adherence is failure to take a drug properly or discontinuing a drug altogether before completing the necessary course, which for ARVs may be many years. Non-adherence can have a significant negative impact on the health status of PLHIV, leading to increased incidence of OIs and more rapid progression of HIV disease.

Drug side effects and symptoms of OIs are often difficult to distinguish from each other. For example, diarrhoea, vomiting, headaches, malaise, and fever may be side effects of both drugs and OIs. In both cases, appropriate dietary responses may help address these effects, but medical treatment may be needed if the effects are symptoms of infections.

Adherence

Side effects that cause a lot of discomfort or that prevent clients from eating properly may lead to non-adherence. Interrupting or terminating drug regimens can lead to significant worsening of health and even drug-resistant strains of HIV, which are difficult or impossible to treat with available drugs. Managing side effects and other food-drug interactions can help ensure adherence to drug regimens.

Dietary responses to side effects

Appropriate dietary responses can help maintain food intake and compensate for nutrient losses, and in some cases can help reduce the severity of the side effects. For example, if drugs cause taste changes, PLHIV can add salt, sugar, spices, vinegar, or lemon to enhance the flavor of food, stimulate the taste buds, increase taste acuity, and mask unpleasant flavors. Eating energy- and nutrient-dense foods such as maize, groundnuts, and carrots and drinking plenty of liquids may help replace nutrient losses and prevent dehydration during fever or diarrhea.

Dietary management of drug side effects (e.g., changes in taste, loss of appetite, nausea, bloating and heartburn, constipation, vomiting, and diarrhea) is the same as that for similar HIV-related symptoms. Session 4 contains more information on the dietary management of HIV-related symptoms.

Some side effects that do not directly affect food consumption or nutrient absorption may require dietary responses to help reduce the effect. Some ARVs are associated with increased risk of bone disorders such as osteoporosis, osteopenia, and osteomalacia (Tebas et al 2000) 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 deficiency and for pregnant and lactating women whose calcium need increases.

Some drug side effects do not have specific dietary management responses. For example, there is no evidence that changes in diet affect lipodystrophy, which involves redistribution of fat.

Managing side effects requires timely responses, and nurses should help clients identify and act on appropriate dietary responses that help them continue proper eating habits, maintain weight, and adhere to the medications.

The combination of certain drugs and foods can create unhealthy side effects (slide 11)

Combinations of specific drugs and food can cause unhealthy side effects. Such food should not be taken at the same time as these drugs. Drinking alcohol while taking the ARV Didanosine can cause inflammation of the pancreas and 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.

Table 2 lists some of the known contraindications for some drugs taken by PLHIV. The list is not comprehensive, and nurses and trainers are encouraged to add or update the list based on information about drugs used in their contexts.

Table 2: Examples of modern medications with food contraindications

Medication	Purpose	Contraindications
Isoniazid	Treatment of tuberculosis	May cause reactions with foods such as bananas, beer, avocados, liver, smoked pickled fish, yeast, and yogurt Avoid alcohol.
Rifampin	Treatment of tuberculosis	Avoid alcohol.
Indinavir (IDV)	Antiretroviral	Do not eat grapefruit or drink grapefruit juice, which may lower the level of medicine in the blood.
Zidovudine (AZT)	Antiretroviral	Avoid alcohol.

Drug–drug interactions (slides 12–14)

PLHIV often take multiple modern and traditional therapies simultaneously. Therapies can interact with each other, affecting drug efficacy and nutritional status. Such interactions need to be managed appropriately to facilitate the optimal efficacy of therapies and ensure that interactions do not affect food intake or nutrient utilization.

Antacid medications containing magnesium and aluminum interact with the ARV Didanosine and lead to increased side effects. Didanosine should therefore not be taken at the same time as an antacid containing magnesium and aluminum.

Studies have shown that the blood concentration of the ARV Saquinavir decreases by 50 percent if taken with a garlic supplement. Garlic supplements, which are sometimes taken as a traditional therapy to strengthen the immune system, should not be taken with Saquinavir (Piscitelli et al 2002). The antifungal agents Fluconazole (Diflucan®) and Ketoconazole (Nizoral®) may inhibit the metabolism of protease inhibitors and contribute to increase the toxicity of these drugs.

Common HIV and AIDS therapies, dietary recommendations, and side effects

Handout 5.1 lists the purposes, food recommendation, and potential side effects of some drugs (ARVs and drugs used to treat OIs) commonly taken by PLHIV in resource-limited settings. The handout can be useful for nurses and other health care workers to guide clients in managing nutritional implications and side effects of drugs. The list is not comprehensive, however, and nurses and trainers are encouraged to add to or update it to include drugs used in their contexts. Dietary responses to help manage common side effects are found in **Handout 4.1** in Session 4.

Components of managing nutritional implications of HIV/AIDS therapies (slide 15)

Managing the nutritional implications of HIV and AIDS therapy involves 1) information, 2) identification of food and nutrition responses, and 3) implementation and follow-up.

1. Nurses should understand the following in order to obtain and provide needed **information** (slides 16 and 17):
 - The client's nutritional status, pre-existing nutrition issues, and changes in his/her nutritional status
 - Reasons for poor nutritional status for clients who have BMI <18.5 or who have unintentionally lost more than 5 percent of body weight in the past 3 months. Reasons may include infections or inadequate dietary intake because of to symptoms, poor access to food, or psychosocial factors.
 - The drugs a client is taking or will take in the near future, including both ARVs and other drugs
 - The specific interactions between the drugs taken and food and nutrition.
 - Foods available to the client, including local foods
 - The client's dietary practices and preferences
 - The client's access to food, factors limiting access, and opportunities to improve access
 - Herbal or other traditional therapies the client is taking

2. **Identification of food and nutrition responses** involves the following (slide 18):
 - Identifying foods to eat more of and foods to eat less of or avoid
 - Planning and preparing a drug-food timetable based on the client's context, drug regimen, food interactions, constraints, and preferences
 - Identifying ways to reduce constraints and increase food access if needed
 - Helping the client identify the best feasible options for improving nutrient intake and managing drug-food interactions. Options will depend on the drugs used, their specific food and nutrition implications, the availability of food and supplements, and the client's circumstances and constraints.
 - Referring the client for therapeutic feeding and nutritional rehabilitation if he or she is severely malnourished
 - Related steps to help maintain good nutritional status, such as performing regular physical activity and drinking clean, safe water.

3. Implementation and follow-up involves the following (slide 19)

- Supporting implementation through continued regular contact
- Involving other household members to support the responses
- Linking or referring the client to other resources as needed.
- Eliciting and responding to feedback about the feasibility of chosen options, opportunities to improve them, and challenges faced
- Assessing adherence to drugs and the drug-food timetable and reasons for non-adherence
- Helping the client make adjustments as needed

Session 9 includes additional information on nutrition counseling for PLHIV in Handouts 9.3, 9.4, and 9.5).

Key issues for managing nutrition implications of HIV and AIDS therapy (slide 20)

ART is becoming simpler, with fewer doses and fewer pills. Given this evolution and the scale-up of access to ART, it is important for nurses to stay up to date on the possible interactions between drugs and food and nutrition and steps to manage these interactions. The following recommendations can guide nurses in addressing food and nutrition implications of HIV and AIDS therapy. These can 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 a client is taking several drugs, consider the interactions of each drug, as well as possible drug-drug interactions. In some cases, the nutrition implications of a drug combination differ from the implications of the drugs individually. For example, food reduces the absorption of the PI Indinavir, but studies have shown that when Indinavir is taken in combination with Ritonavir, food has no effect on its absorption, so that it can be taken with or without food.
- Some side effects are similar to symptoms of OIs. It is important to try to distinguish between side effects and OI symptoms that may require referral for treatment.
- Involve the client fully in understanding interactions, identifying feasible responses, and adjusting or improving responses as needed.
- When possible, make sure that recommended dietary actions build on the client's practices and preferences.
- If the client is taking traditional therapies, pay attention to their side effects and nutrition implications. Some side effects of traditional medicines are known, but there may be other side effects or nutrition implications that are not known. Help clients who are using traditional therapies to identify side effects and food interactions, and any dietary responses that can help address them.

- Be attentive to any side effects and nutrition implications of ARVs for undernourished clients. Documentation of the effects of ARVs on undernourished people is very limited, and nurses should help clients act promptly to alleviate any observed negative impacts on nutritional status.
- Food insecurity may keep PLHIV from following optimal food and nutrition recommendations. Nurses should help clients identify alternative responses that are feasible in the circumstances and when possible seek options to improve food security. Session 7 provides more information on food insecurity faced by PLHIV.
- Recognize that each client will have an individual response to drugs. All clients taking the same drugs should not be treated the same. Stay attentive and responsive to client-specific reactions.
- Pregnant and lactating women with HIV have increased nutrition needs. Therefore, it is important to ensure that drug and food interactions do not reduce their food intake or nutrient absorption. Timely management of drug-food interactions is needed to protect the health of the mother and infant. Managing drug-food interactions for pregnant and lactating women is similar to that for other PLHIV. Session 9 provides more information on general nutrition care and support for pregnant and lactating women.
- Many countries have national guidelines on nutrition and HIV with information and recommendations about drug-food interactions. These guidelines are an important reference for service provision.

Client situation assessment

Assessing the client's household food situation will help the nurse understand the client's eating practices, access to different foods, and constraints. This information—combined with information about the drugs the client is taking—helps the nurse work with the client to identify optimal, feasible responses to manage side effects and address interactions between drugs and food and nutrition.

Sample questions to include in an assessment

Eating habits and food security

- What foods does the client eat often?
- How many meals does the client eat per day?
- Does the client make his/her own decisions about what food to eat? If not, who makes these decisions?
- Who prepares the client's food?
- What is the period of food shortages?
- What foods are affected?
- How does the client cope during food shortages?
- What foods are the most available and affordable for the client?

Medications

- What drugs is the client taking?
- What are the specific food-drug interactions for each drug and for all the drugs combined? Which drugs need to be taken on an empty stomach and which with meals? What foods should be avoided? What nutrients are affected by drugs?
- What dietary or other responses are needed?
- What are the side effects of each drug and of the combined drugs?
- What dietary responses are recommended to alleviate the side effects?
- What are the food access or other constraints to implementing identified dietary responses?
- What alternative solutions are feasible given the constraints?
- What options and opportunities exist to address or reduce the constraints?
- What is the recommended timing for each drug? In relation to meals?
- What are the constraints to following the food-drug timetable?
- What alternatives are there to the food-drug timetable?

Exercise 1. Facilitate a question and answer session on the nutrition implications and management of Isoniazid (or another drug) to help students understand how to identify and manage food-drug interactions in ART. Read the following situation: *Joseph has HIV and has been taking Isoniazid for 3 months. He is complaining of nausea and fatigue. His doctor asked the nurse to provide nutrition counseling to Joseph.* Ask students to discuss the nutrition implications of Isoniazid for this patient and the appropriate dietary management. Ask students which reference materials provided in this session they would check in this case. (Refer students to **Handout 5.1: Common Drugs Taken by PLHIV, Likely Side Effects, and Recommended Dietary Practices to Increase Drug Efficacy.**) You can also use other drugs in place of Isoniazid in the example.

Exercise 2. Ask for two volunteers to role-play an assessment of drug-food interactions in ART during counseling. Give each student a copy of **Handout 5.3. Case Study for Counseling on Managing Drug-Food Interactions.** Ask one volunteer to role-play the counselor and the other to role-play the client. The rest of the students will observe to assess the quality of counseling. Distribute **Handout 5.2: Observation Checklist for Counseling on Management of Drug-Food Interactions in ART** to the rest of the students to use for observation and feedback. Ask the students to write their comments in the “Comments” column.

Remind students to bear in mind potential side effects and drug-food interactions of the ARVs prescribed to the client. The “counselor” should try to help the client maintain food intake and adhere to treatment as well as to ensure drug efficacy. The role-play should include assessment, identification of options based on the assessment, and support to implement options selected.

After the role-play, ask the “counselor” to explain what he or she found easy or difficult during the assessment. Ask the other students to provide feedback using the checklist and following the order of the checklist. Ask the students to start with what the counselor did well and then add what needs to be improved and suggest how to improve.

Conclusions (slide 21)

Careful consideration and management of drug-food interactions is an important component of successful HIV and AIDS therapy. Proper management of interactions between drugs and food and nutrition will help ensure efficacy of treatment, minimize the side effects of drugs, ensure adherence to therapy, and minimize any negative impact on nutritional status.

To support successful management of the food and nutrition implications of a client's ART, the nurse needs to understand the client's situation, including the specific food and nutrition interactions of drugs taken, food security constraints and available foods, and the client's individual responses, needs, and preferences. Nurses can integrate management of nutrition implications of therapies into all stages of treatment: client assessment, provision of medicines, counseling, and follow-up.

References

Carr, A. 2003. Lactic Acidemia in Infection with Human Immunodeficiency Virus. *Clinical Infectious Diseases* 36 (supplement 2) S96–100.

Castleman, T., E. Seumo, and B. Cogill. 2004. Food and Nutrition Implications of Antiretroviral Therapy in Resource Limited Settings. Washington, DC: Food and Nutrition Technical Assistance (FANTA) Project, Academy for Educational Development.
Food and Nutrition Technical Assistance (FANTA) Project. 2001. HIV/AIDS: A Guide for Nutrition, Care and Support. Washington, DC: Academy for Educational Development.

Gelato, M. 2003. Insulin and Carbohydrate Dysregulation. *Clinical Infectious Diseases* 36: S91–5.

Nerad, J., M. Romeyn, E. Silverman, J. Allen-Reid, D. Dietrich, J. Merchant, V. Pelletier, D. Tinnerello, and M. Fenton. 2003. General Nutrition Management in Patients Infected with Human Immunodeficiency Virus. *Clinical Infectious Diseases* 36.

Piscitelli, S. C., A. H. Burstein, N. Welden, K. D. Gallicano, and J. Falloon. 2002. The Effect of Garlic Supplements on the Pharmacokinetics of Saquinavir. *Clinical Infectious Diseases* 34:234–38.

Pronsky, Z. M., S. A. Meyer, and C. Fields-Gardner. 2001. HIV Medications, Food Interactions (and So Much More). 2nd edition. Birchrunville, PA: Food-Medication Interactions.

Raiten, D., S. Grinspoon, and S. Arpadi. 2005. Nutritional Considerations in the Use of ART in Resource-Limited Settings. Nutrition and HIV/AIDS in Africa: Durban, South Africa, April 10-13, 2005.

Regional Centre for Quality of Health Care. 2004. Food and Nutrition Counseling for PLWHA on Antiretroviral Therapy. Kampala, Uganda.

Tebas, P., W. G. Powderly, S. Claxton, D. Marin, W. Tantisiriwat, S. L. Teitelbaum, et al. 2000. Accelerated Bone Mineral Loss in HIV-Infected Patients Receiving Potent Antiretroviral Therapy. *AIDS* 14:F63–7.

World Health Organization (WHO). 2006. Antiretroviral Therapy for Adolescents and Adults in Resource-Limited Settings: Towards Universal Access. Recommendations for a Public Health Approach. Geneva.

Handout 5.1. Common Drugs Taken by PLHIV, Likely Side Effects, and Recommended Dietary Practices to Increase Drug Efficacy

Medication	Purpose	How to take	Potential side effects
Abacavir (ABC)	Antiretroviral	Take without regard to food.	Nausea, vomiting, fever, allergic reaction, anorexia, abdominal pain, diarrhea, anemia, rash, hypotension, pancreatitis, dyspnea, weakness and insomnia, cough, and headache
Didanosine (ddl)	Antiretroviral	Take with water only, 1 hour before or 2 hours after eating Avoid alcohol. Do not take with juice or antacid that contains aluminum or magnesium.	Anorexia, diarrhea, nausea, vomiting, pain, headache, weakness, insomnia, rash, dry mouth, lost of taste, constipation, stomatitis, anemia, fever, dizziness, and pancreatitis
Efavirenz	Antiretroviral	Take with food, but not with a high-fat meal. Avoid alcohol.	Elevated blood cholesterol levels, elevated triglycerides levels, rash, dizziness, anorexia, nausea, vomiting, diarrhea, dyspepsia, abdominal pain, flatulence
Indinavir (IDV)	Antiretroviral	Take 1 hour before or 2 hours after meal. Drink at least 1,500 ml of liquid daily. Do not drink grapefruit juice, which may lower the level of medicine in the blood. Avoid St. John's wort.	Nausea, abdominal pain, headache, kidney stones, taste changes, vomiting, regurgitation, diarrhea, insomnia, ascites, weakness, and dizziness May increase the risk of lipodystrophy
Lamivudine (3TC)	Antiretroviral	Take without regard to food. Avoid alcohol.	Nausea, vomiting, headache, dizziness, diarrhea, abdominal pain, nasal symptoms, cough, fatigue, pancreatitis, anemia, insomnia, muscle pain, and rash.
Lopinavir	Antiretroviral	Take without regard to food. Avoid St John's wort.	Abdominal pain, diarrhea, headache, weakness, nausea

Medication	Purpose	How to take	Potential side effects
			May increase the risk of lipodystrophy and/or diabetes.
Lopinavir	Antiretroviral	Take without regard to food. Avoid St John's wort.	Abdominal pain, diarrhea, headache, weakness, nausea May increase the risk of lipodystrophy and/or diabetes.
Nelfinavir	Antiretroviral	Take with a meal or light snack. Avoid St John's wort.	Diarrhea, flatulence, nausea, abdominal pain, and rash May increase the risk of lipodystrophy
Nevirapine (NVP)	Antiretroviral	Take without regard to food. Avoid St John's wort.	Nausea, vomiting rash, fever, headache, skin reactions, fatigue, stomatitis, abdominal pain, drowsiness, paresthesia High hepatotoxicity
Ritonavir	Antiretroviral	Take with a meal if possible. Avoid St John's wort.	Nausea, vomiting, diarrhea, hepatitis, jaundice, weakness, anorexia, abdominal pain, fever, diabetes, headache, dizziness May increase the risk of lipodystrophy
Saquinavir	Antiretroviral	Take with a meal or light snack within 2 hours of a high-fat meal and high-calcium meal. Avoid garlic supplements and St John's wort.	Mouth ulceration, taste changes, nausea, vomiting, abdominal pain, diarrhoea, constipation, flatulence, weakness rash, and headache. May increase the risk of lipodystrophy.
Stavudine (d4T)	Antiretroviral	Take without regard to food. Limit consumption of alcohol,	Nausea, vomiting, diarrhea, peripheral neuropathy, chills and fever, anorexia, stomatitis, anemia, headaches, rash, bone marrow, and pancreatitis May increase the risk lipodystrophy

Medication	Purpose	How to take	Potential side effects
Tenofovir (TDF)	Antiretroviral	Take with food.	Abdominal pain, headache, fatigue, and dizziness
Zidovudine (AZT)	Antiretroviral	Take without food or with a low-fat meal. Do not take with a high fat meal. Avoid alcohol.	Anorexia, anemia, nausea, vomiting, bone marrow suppression, headache, fatigue, constipation, fever dizziness, dyspnea, insomnia, muscle pain, and rash
Isoniazid	Treatment of tuberculosis	Take 1hour before or 2 hours after meals. May react with foods such as bananas, beer, avocados, liver, smoked pickled fish, yeast and yogurt. May interfere with vitamin B ₆ metabolism and require vitamin B ₆ supplementation. Avoid alcohol.	Anorexia and diarrhea.
Rifampin	Treatment of tuberculosis	Take on an empty stomach 1hour before or 2 hours after meals. Avoid alcohol.	Nausea, vomiting, diarrhea, and loss of appetite
Fluconazole	Treatment of candida (thrush)	Take with food.	Nausea, vomiting, diarrhea Can be taken during breastfeeding
Nystatin	Treatment of thrush	Take with food.	Infrequent occurrence of diarrhea, vomiting, nausea
Sulfonamides: Sulfamethoxazole, Cotrimoxazole (Bactrim® and Septra®)	Antibiotic for treatment of pneumonia and toxoplasmosis	Take with food.	Nausea, vomiting, and abdominal pain
Chloroquine	Treatment of malaria	Take with food.	Stomach pain, loss of appetite, nausea, vomiting Not recommended for breastfeeding women

Medication	Purpose	How to take	Potential side effects
Quinine	Treatment of malaria	Take with food.	Abdominal or stomach pain, diarrhea, nausea, vomiting, lower blood sugar
Sulfadoxine and Pyrimethamine (Fansidar®)	Treatment of malaria	Take with food and continuously drink clean boiled water.	Nausea, vomiting, taste loss, and diarrhea Not recommended if folate deficient or breastfeeding

Source: Adapted from FANTA 2001, Pronsky et al 2001, Nerad 2003, Castleman et al 2003, and WHO 2003.

Note: This table is not comprehensive, and nurses and trainers are encouraged to add or update the list to reflect medications used in their contexts.

Handout 5.2. Observation Checklist for Counseling on Management of Drug-Food Interactions

Problem: The client is experiencing drug side effects and drug-food interactions.

Purpose: The purpose of the assessment is to improve the counselor's understanding of the client's eating habits, access to different foods, and constraints. This information, combined with information about the drugs the client is taking, allows the counselor to help the client choose the best feasible dietary responses to manage the side effects and address the food-drug interactions.

	Yes	No	Comments
1. Did the counselor ask the client about:			
<i>Eating practices</i>			
Foods frequently eaten?			
Number of meals per day?			
Decision-maker about foods and meal?			
Preparer of meals?			
Period of food shortage?			
Foods affected by food shortage?			
Client's coping strategy during food shortage?			
Most available and affordable foods?			
<i>Medications</i>			
Drugs the client will take?			
Types and frequency of problem experienced with these drugs?			
2. From the counselor's own knowledge and information from the client, did the counselor find out about:			
Side effects of each drug and drug combinations?			
Food-drug interactions for each drug and drug combinations?			
Dietary responses that address the food-drug interactions and alleviate the side effects?			

3. Did the counselor discuss with the client:			
Recommended dietary and other responses to address food-drug interactions, including side effects?			
Constraints the client faces to implementing identified dietary responses?			
Alternative options feasible within constraints?			
Options and opportunities to reduce constraints?			
Recommended timing for each drug?			
Constraints of the drug timetable?			
Ways to adjust eating practices to follow the drug-food timetable and other recommendations?			

Handout 5.3. Case Study for Counseling on Managing Food-Drug Interactions

George is 38 and HIV positive. His health condition has declined seriously in the past few months. After measuring George's CD4 count and viral load, the doctor informed him that he was eligible to enroll in the ART program. He explained the program in detail, and John agreed. The doctor prescribed a combination of Zidovudine/Lamivudine/Efavirenz (ZDV/3TC/EFV) and explained how many tablets George should take per day and how often. The doctor referred him to the nurse for counseling on how to manage the food and nutrition implications of these drugs.

Session 5. Management of Nutrition Implications of Antiretroviral Therapy



Purpose

Provide information about the nutrition implications of drugs used to treat HIV and effective management of these implications.

2

Learning Objectives

- Explain the importance of managing drug-food interactions in HIV treatment.
- Know the most common drugs taken by people living with HIV (PLHIV), their nutrition implications, and responses to manage those implications.
- Be able to help PLHIV identify and implement actions to manage nutrition implications of drugs.

3

Session Outline

- Overview
- Drug-food interactions
- Management of nutrition implications of ART
- Conclusions

4

Rationale

- PLHIV take a variety of drugs to treat symptoms of HIV and AIDS.
- Drugs can interact with food and nutrients, affecting the efficacy of the drugs and nutritional status.
- Management of nutrition implications of HIV and AIDS therapy aims to do the following:
 - Improve medication efficacy
 - Prevent deterioration in nutritional status
 - Ensure adherence to drugs

5

Overview of HIV Therapies

- Antiretroviral drugs (ARVs)
- Antifungals
- Antibiotics
- Antimalarials
- Anthelmintics
- Dietary supplements
- Traditional therapies

6

Interaction between Drugs and Food/Nutrition

- Food can affect drug efficacy.
- Drugs can affect nutrient utilization.
- Drug side effects can affect food consumption or nutrient absorption.
- Combinations of certain drugs and foods can create unhealthy side effects.

7

Food Drug Efficacy *Affects*

Examples

- Food reduces absorption of:
 - Aspirin (analgesic)
 - Isoniazid (antituberculosis)
 - Rifampin (antituberculosis)
- A high fat meal:
 - Enhances the bioavailability of Tenofovir (ARV)
 - Reduces the absorption of Indinavir (ARV)

8

Food Nutrient Utilization *Affects*

Examples

- Ritonavir (ARV) and lipids: Elevated cholesterol and triglycerides
- Isoniazid and vitamin B₆
- Rifampin and vitamin D

9

Drug Side Effects *Affect* Food Consumption and Nutrient Absorption

Examples

- Changes in taste
- Nausea
- Anorexia
- Vomiting
- Diarrhea

10

Drug-Food Combinations *Cause* Unhealthy Side Effects

Examples

- Alcohol and Didanosine (ARV) can cause inflammation of the pancreas.
- Alcohol and Isoniazid can cause inflammation of the liver.

11

Interaction of Therapies

Examples

- Saquinavir (ARV) and garlic
- Didanosine (ARV) and antacids

12

Management of Nutrition Implications Example: Ziduvodine (ARV)

Interaction 1

- A high-fat meal reduces absorption

Management

- Take the drug without food.
- If nausea of stomach upset, take with a low-fat meal. Do not eat with a high-fat meal.

13

Management of Nutrition Implications Example: Ziduvodine, Cont.

Interaction 2: Possible side effects: Anorexia, anemia, nausea, vomiting, headache, diarrhoea, taste changes, constipation

Management

- Anorexia: Eat small, frequent meals.
- Nausea and vomiting: Eat small amounts often.
- Diarrhea: Drink plenty of liquids, continue eating.
- Taste changes: Use salt, spices, or lemon.
- Constipation: Eat high-fiber foods and drink plenty of liquids.

14

Managing Nutrition Implications of ARVs: Components for Nurses

1. Information
2. Identification of food and nutrition responses
3. Implementation and follow-up.

15

1. Information

- Understand the food/nutrition interactions with drugs the PLHIV is taking.
 - Different drugs have different interactions.
 - Consider drug combinations.
 - Help the client understand interactions in terms of specific foods.
- Understand what foods are available and currently eaten by the client and help the client find ways to diversify the diet.

16

1. Information, cont.

- Conduct a nutrition assessment of the client.
 - Nutritional status
 - Eating habits
 - Meal frequency
 - Copies strategies
- Assess the client's access to food
 - How poor access prevents proper food-drug management
 - Factors that limit access
 - Opportunities to strengthen access

17

2. Identification of Food and Nutrition Responses

- Help PLHIV identify the best feasible options.
- Identify which foods to eat more of and which to avoid based on drug-food interactions and foods that are available and accessible.
- Plan a feasible drug-food timetable with the client.
- Identify ways to increase access to food and care.
 - Linkages and referrals to other services
 - Opportunities and adjustments in the household

18

3. Implementation and Follow-up

- Support PLHIV through regular contact and referral to needed resources.
- Involve other household members.
- Seek feedback from PLHIV on what is working and what isn't, sources of problems, and opportunities to improve.
- Adjust as needed if conditions or drugs change.

19

Key Issues

- Involve PLHIV throughout!
- Distinguish between symptoms OIs that require treatment and drug side effects.
- Consider how traditional therapies may affect nutrition.
- Refer to national guidelines.

20

Conclusions

- Managing nutrition implications of ARVs is critical for:
 - Drug efficacy
 - Nutritional status
 - Adherence to therapy
- Integration of nutrition management into medical services is important for:
 - Assessment
 - Drug provision
 - Counseling
 - Follow-up

21