

# Nutrition and HIV among Young Children

Nutrition and HIV/AIDS: A Training Manual  
Session 8

# Purpose

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To present current knowledge on nutritional care and support for children infected with HIV or born to HIV-infected mothers and care of severely malnourished children with HIV/AIDS

# Session Outline

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- Etiology of growth failure among children infected with HIV or born to HIV-infected mothers
- Nutrition actions to prevent or reduce wasting and specific nutrition deficiencies
- Issues in managing severely malnourished children with HIV/AIDS

# Sources of HIV Infection in Children

# HIV Infection in Children

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- Most HIV+ children are born to HIV+ mothers. About **one-third** are infected during pregnancy, at delivery, or through breastfeeding
- Some are infected through HIV-contaminated blood or medical equipment
- Some are infected through child sexual abuse
- By 2000 more than 5 million children were estimated to be living with HIV/AIDS, more than 80% of them in Africa

# HIV Infection in Children, Cont.

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- Assessing the HIV status of children is expensive
- Conventional methods such as HIV antibody tests (ELISA and Western Blot assays) cannot reliably differentiate infants' own antibodies from maternal antibodies acquired through the placenta
- More expensive virologic assays such as DNA polymerase chain reaction (PCR) are more useful for defining HIV in young children

**Risk of Malnutrition  
among  
HIV-Infected Children  
and Children Born to  
HIV-Infected Mothers**

# Children Born to HIV-Positive Mothers

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- Start with a compromised nutritional status
- Are more likely to have low birth weights
  - A study in Kigali, Rwanda, reported mean weight of 2,947g in infants of HIV+ women compared with 3,104g in those born to HIV-mothers (Casterbon et al 1999)
  - Even full-term and uninfected infants of HIV+ mothers have lower length-for-age Z-scores at birth (Agostoni et al 1998)



# Main Factors Associated with Reduced Birth Weight

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- Shorter gestational age among HIV+ women
- Viral load among HIV+ women (severity of HIV disease)
- Intrauterine growth retardation from HIV+ women's
  - Lower energy intake compared to increased needs from HIV
  - Lower vitamin A (multivitamin) status
  - Drug or alcohol use during pregnancy

# Sources of Growth Failure in HIV-Infected Children

# Growth Faltering and Wasting

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- Growth faltering and weight for age below the 3<sup>rd</sup> percentile are recognized as important signs of HIV infection (WHO)
- Wasting is a sign of HIV/AIDS in children as well as in adults (CDC)

# Compromised Nutritional Status of HIV-Positive Infants

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- More severe reductions in birth weight and length

A study in the United States (Move et al 1996) showed HIV-positive newborns weighing 0.28kg less and measuring 1.64cm less than HIV-negative children born to HIV-positive mothers

# Progressive Stunting in HIV-Positive Children

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- Perinatal HIV infection associated with early and progressive growth failure
- More devastating nutrition implications of HIV for children because of added growth and development demands
- Significant weight and length differences by 2<sup>nd</sup> year, even excluding early mortality (Move et al 1996; Berhane et al 1997)
- Preferential reduction in fat-free body mass (Arpadi et al)



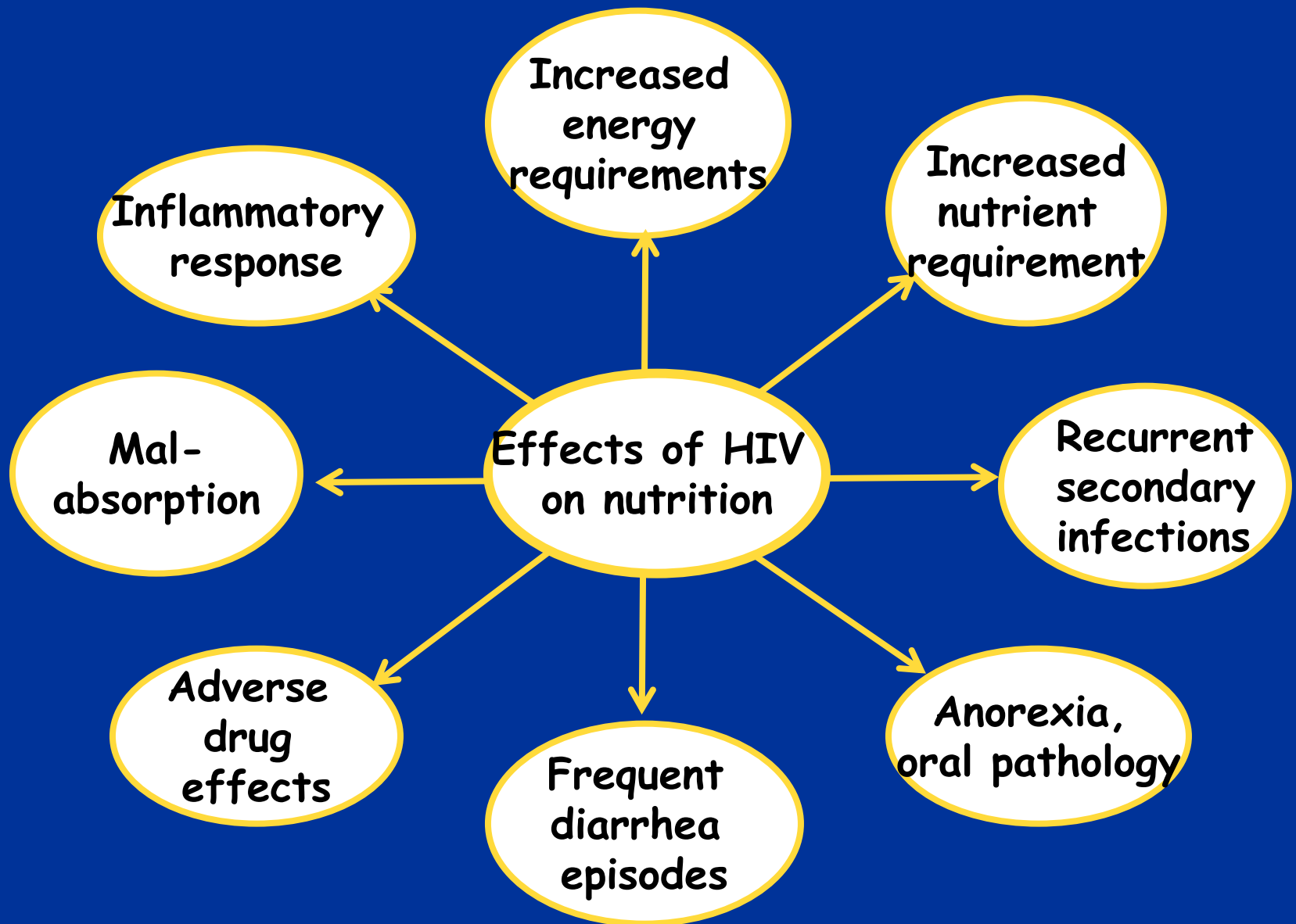
# Etiology of Growth Failure in HIV-Infected Children

# Growth Failure Is Complex and Multifactorial

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- Reciprocal relation between HIV viral load and growth
  - Favorable effect of suppression of viral load on growth (especially weight)
  - Positive effect of protease inhibitors on growth and lean body mass
- Underlying morbidity (disease activity)
- Simple starvation (inability to consume adequate energy and nutrients), including malabsorption and gastrointestinal disease
- Negative effect on fat-free mass of metabolic and endocrine alterations associated with stress and trauma
- Micronutrient deficiencies (vitamin A, zinc, selenium)

# Effects of HIV/AIDS on Nutrition



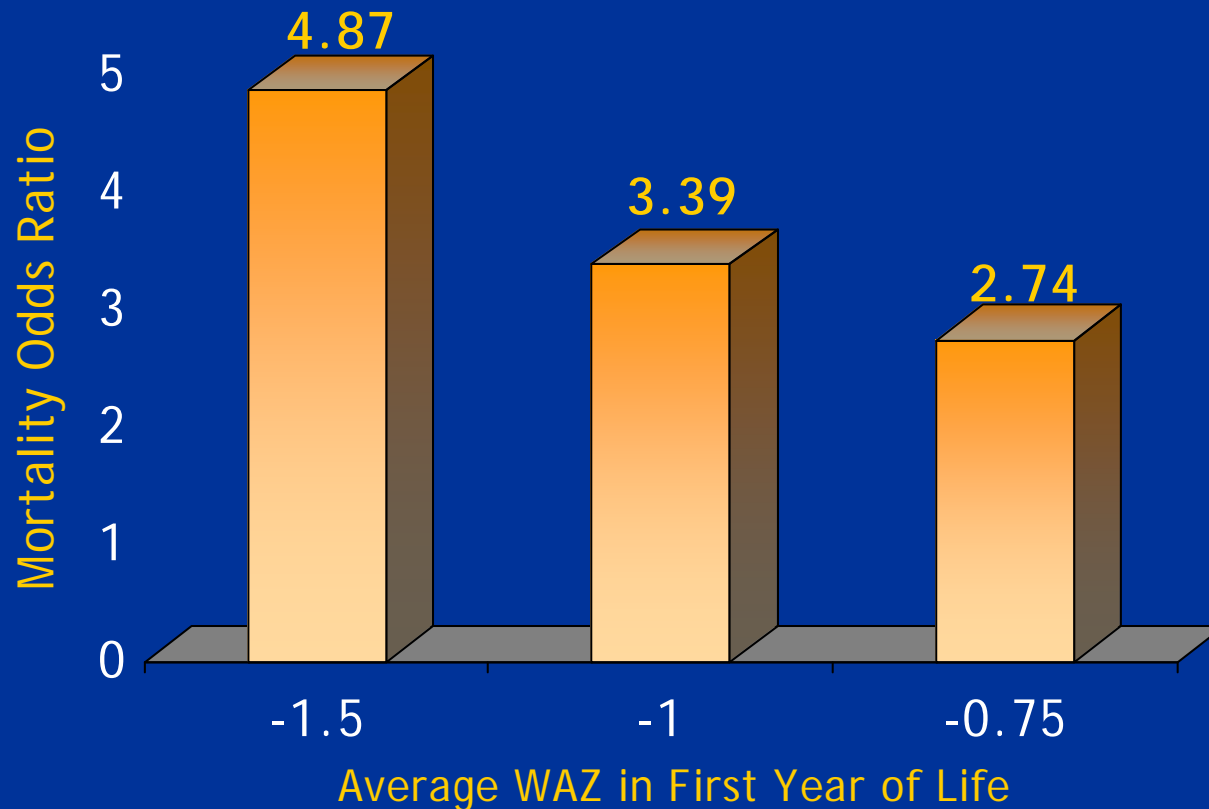


Consequences  
of Growth Failure  
in HIV-Infected Children

The severity of **growth failure** among HIV-positive children is associated with reduced survival.

# Growth Failure Associated with Increased Risk of Death

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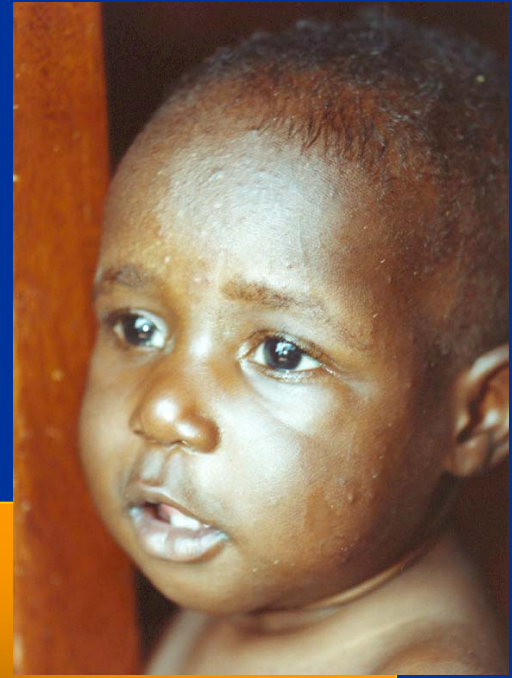


HIV-infected infants with weight-for-age below -1.5 Z-scores have five times higher risk of dying before 25 months than non-infected children (Berhane et al 1997)

# Other Factors Associated with HIV Infection in Children

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- Retarded cognitive development and functional deficits (e.g., delayed sexual development among boys)
- Body composition alterations, with preferential decreases of the lean body mass (or fat-free mass)



# Nutritional Care and Support of Young Children Infected with HIV

# Goals of Nutritional Care and Support

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- Provide essential co-therapy to maximize medical management of HIV
- Prevent wasting and specific nutrient deficiencies
- Build stores of essential nutrients to boost immunity to resist infections and speed recovery
- Prevent food-borne illnesses and their impact
- Support HIV therapy by improving the effectiveness of drug treatment and reducing cost to family and care-giving institution

# Factors to Consider in Planning Nutritional Support

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- Nutritional status
- Nutrient requirements
- Food-intake-related problems
- Food preferences and dislikes
- Food allergies and intolerance
- Stage of HIV infection
- Weight loss and changes
- Medical problems and treatment, including medications
- Socioeconomic status
- Family support
- Nutrition knowledge of caretaker

# Essential Components of Nutritional Support

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1. Good obstetric care and maternal nutrition to prevent low birth weight and prematurity
2. Frequent nutritional monitoring to recognize early growth faltering and other nutritional problems and inform interventions
3. Increased food intake and diversification, including periodic supplementation (especially with vitamin A)
4. Promotion of proper food hygiene and handling and periodic deworming
5. Prompt treatment of infections that cause weight loss
6. Use of antiretrovirals where available and affordable



# Good Obstetric Care and Maternal Nutrition

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- Identification of HIV+ women through VCT
- Support to ensure increased intake of energy and protein and food diversification to increase micronutrient intake (possible supplementation with multiple micronutrient)
- Support to avoid drugs and alcohol during pregnancy
- Monitoring of side effects of ARVs and other drugs and possible interaction with food and nutrition
- Support for safe infant feeding option

# Frequent Nutritional Monitoring

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## Signs and type of malnutrition

- Anthropometry: weight and height for age
  - Skinfold thickness >1 yr a good measure of fat stores
  - MUAC >14 yrs a good measure of lean body mass
  - Head circumference for <3 yrs
- Biochemistry: Hb, serum albumin, urinalysis
- Clinical examination: Signs of nutrient deficiencies, dehydration, and edema

# Frequent Nutritional Monitoring, Cont.

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## Assessment of feeding history

- Adequacy of feeding (enough food?)
  - Food eaten (including breastmilk)
  - Frequency of feeding
  - Methods of feeding
- Feeding problems
  - Appetite and swallowing problems, oral thrush, sores
  - Allergies
  - Hygiene practices in feeding and food handling

# Proper Food Hygiene and Handling

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- Safe water and sanitation to maintain child health and prevent infections such as diarrhea and specific opportunistic infections that can cause weight loss
- Proper food handling of baby food and feeds and frequent deworming, especially to prevent anemia

# Increased Food Diversification and Intake

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- Increased diversification to increase micronutrient intake
- Increased frequency of intake
- Use of high-energy and nutrient-dense foods (e.g., germinated, fermented, and fortified foods)
- Dietary modification to enable increased intake (e.g., pureeing, mashing, or slightly spicing food)

# Prompt Treatment of Infections

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- Mouth pathology (sores and thrush)
- Gastroenteritis symptoms
- Inter-current infections (diarrhea, acute respiratory infections)
- Constipation



# Enhanced ARV Therapy

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- To reduce viral load
- To reduce incidence of opportunistic infections
- To monitor side effects that may have affect dietary intake (e.g., Hb for children taking AZT)

# Nutrition Actions to Prevent Wasting and Specific Nutrient Deficits



# Nutritional Management of Severe Malnutrition

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- Treat and prevent hypoglycemia
- Treat and prevent hypothermia
- Correct electrolyte imbalance
- Treat and prevent infections
- Correct dehydration
- Update immunization status
- Investigate infection
- Follow up

# Nutritional Care of Severely Malnourished HIV+ Children

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1. Nutritional diagnosis
2. Dietary prescription
3. Implementation
  - In hospital or health facility
  - At home
4. Follow up and monitoring of progress

# Eating Difficulties Associated with HIV

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- Anorexia
- Taste changes
- Nausea and vomiting
- Early satiety
- Gas and bloating
- Mucositis and stomatitis
- Esophagitis
- Difficulty with chewing and breastfeeding
- Dysphagia
- Allergies
- Constipation
- Diarrhea
- Mouth sores
- Dry mouth
- Malabsorption

# Practical Management of Eating Difficulties

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## Associated with mouth sores and thrush

- Treat sores and thrush
- Counsel to reduce the amount of sugar in food
- Counsel to avoid spicy and irritating (acidic) foods



# Practical Management of Eating Difficulties, Cont.

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## Associated with appetite

- Support responsive and active feeding
- Feed child's favorite foods in small amounts and more often
- Provide micronutrient supplements (multivitamins)
- Provide appetite stimulants

# Practical Management of Eating Difficulties, Cont.

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## Associated with swallowing

- Encourage oral intake if possible
- Options
  - Special diet (change consistency of food and drink, improve flavor, encourage sipping of foods)
  - Supplementation and fortification to improve energy and nutrient density and availability

# Practical Management of Eating Difficulties, Cont.

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## Associated with swallowing, cont.

- If oral route is impossible but gastrointestinal tract is functional, tube feed with a suitable enteral product
- If gastrointestinal tract is not functional (complete bowel obstruction, severe malabsorption, severe enteritis) and enteral route is not possible, consider tube parenteral nutrition (TPN)



# Practical Management of Eating Difficulties, Cont.

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## Associated with diarrhea and malabsorption

- Give more fluids and fruits
- Give yogurt instead of fresh milk (continue breastfeeding)
- Reduce oil in food
- Avoid food with insoluble fiber
- Give micronutrient supplements



# Practical Management of Eating Difficulties, Cont.

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At convalescence, enhance weight gain

- Introduce one new food item at a time
- Increase protein content of food (e.g., add peanut butter, split beans, eggs, or fish powder to vegetable soups or porridge)
- Slowly increase the fat content of food

# Follow up and Monitoring of Progress

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Monitor at regular intervals (e.g., through clinic attendance)

- Changes in nutritional status (improvement vs. deterioration)
- Reasons for poor progress
  - Inadequate intake (address food-related problems and make adjustments)
  - Increased requirements
  - Losses or malabsorption
  - Health-related problems

# Care of the Terminally Ill Child

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## Why?

- To maximize quality of life
- To determine appropriate nutritional support

## What to consider?

- Oral intake vs tube feeding vs. TPN and simple hydration
- Role of hospices and support groups
- Wishes of caregivers and need for information