

**Module 03    Lecture 01**

**The impact of diarrhoea  
on nutritional status**

# Impact of diarrhoea on nutritional status

## *short term effects*

- ◆ fluid loss
- ◆ dehydration
- ◆ electrolyte imbalance

## *medium to long term effects*

malabsorption leading to malnutrition  
and growth retardation

# Impact of diarrhoea on nutritional status

*The nutritional impact of diarrhoea operates through at least four mechanisms*

- |               |   |                    |
|---------------|---|--------------------|
| ◆ food intake | → | appetite loss      |
| ◆ absorption  | → | malabsorption      |
| ◆ metabolism  | → | altered metabolism |
| ◆ direct loss | → | nutrient loss      |

*In addition, nutrient requirements are increased during diarrhoea*

# Impact of diarrhoea on nutritional status

## *Food intake is affected by*

- ◆ **appetite loss**  
result of clinical disturbance, dehydration, electrolyte imbalance, fever, vomiting or abdominal discomfort
- ◆ **maternal behaviour**  
food-withholding behaviour as a response to child's loss of appetite, or due to cultural practices

# Impact of diarrhoea on nutritional status

## *Absorption is affected by*

- ◆ bacterial overgrowth
- ◆ sugar fermentation
- ◆ bacterial competition
- ◆ bile metabolism
- ◆ micelle formation
- ◆ enzyme loss
- ◆ maldigestion
- ◆ loss of absorbing surface
- ◆ transit time
- ◆ osmotic forces
- ◆ loss of enzyme inductive effect

# Impact of diarrhoea on nutritional status

## *Metabolism in prefebrile phase*

- **predominance of anabolic processes**
- **secretion of hormones**
  - ◆ **ACTH**
  - ◆ **growth hormone**
  - ◆ **adrenal corticoids**
- **synthesis of hepatic proteins**
  - ◆ **stimulation of hepatic protein synthesis**

# Impact of diarrhoea on nutritional status

## *Metabolism in febrile phase*

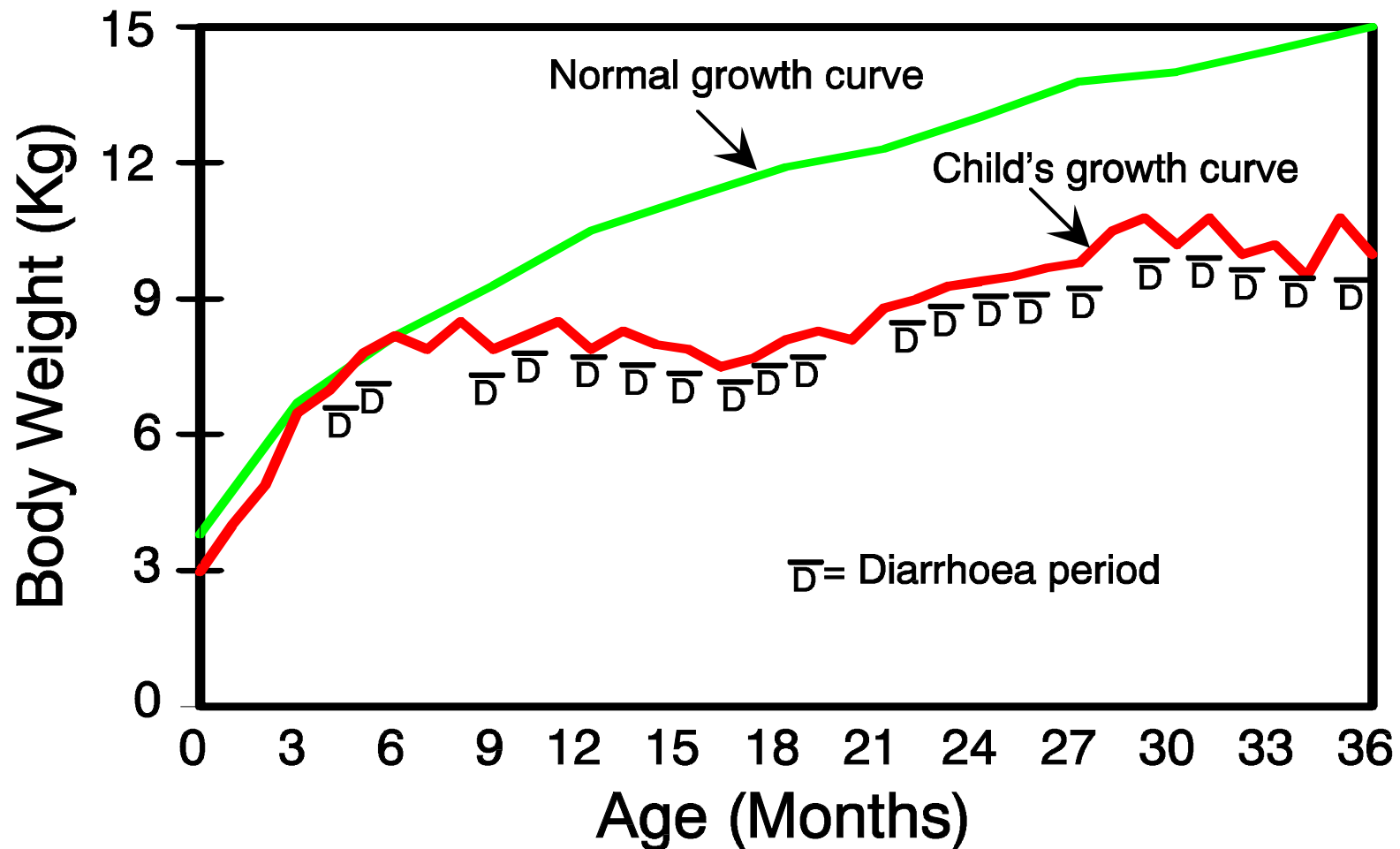
- **catabolic processes predominate**
  - ◆ **increased gluconeogenesis**
  - ◆ **increased glycogenolysis**
  - ◆ **secretion of insulin**
  - ◆ **increased availability of triglycerides, cholesterol and lipoproteins**
  - ◆ **increased aldosterone, ADH and TH**
  - ◆ **obligatory nitrogen and electrolyte loss in sweat, urine and faeces**

# Impact of foodborne diarrhoea on nutritional status

## *Direct loss*

- ◆ malabsorption and direct loss of water and electrolytes because of damage to the intestinal lining
- ◆ protein - losing enteropathy
- ◆ increased bowel movements accompanied by direct loss of water and electrolytes

# Growth pattern of a child with frequent episodes of diarrhoea



# Impact of diarrhoea on nutritional status

**Pathogens**

**Water**

**Food**

**Person to Person**

**Food intake**

Abdominal discomfort  
 Electrolyte imbalance  
 Fever  
 Vomiting  
 Dehydration

**Absorption**

Bacterial overgrowth	Maldigestion
Sugar fermentation	Transit time
Bacterial competition	Osmotic forces
Bile metabolism	Loss enzyme
Micelle formation	Inductive effect
Enzyme loss	Loss of absorbing surface

**Metabolism**

Anabolism / Catabolism / Sequestration

**Direct loss**

Protein - losing enteropathy

**Nutritional Status**



# Intervention strategies for diarrhoea

## *Improved host defences*

- immunisation against immunisable childhood diseases
- nutrition
  - ◆ breast feeding
  - ◆ safe complementary food
- micronutrients

# Intervention strategies for diarrhoea

## *Therapy*

- rehydration
  - ◆ intravenous
  - ◆ oral
  
- antibiotic
  - ◆ acute
  - ◆ prophylactic
  
- feeding practice
  - ◆ convalescent feeding

# Intervention strategies for diarrhoea

## *Prevention of transmission*

- ◆ **water**
- ◆ **sanitation**
- ◆ **household hygiene**
- ◆ **food hygiene**
- ◆ **personal hygiene**
- ◆ **weaning food**
- ◆ **isolation**
- ◆ **disinfection**

# Key messages (1)

- *Acute and persistent diarrhoeas have a significant effect on nutritional status in all age groups*
- *Mechanisms in operation affect*
  - ◆ **food intake**
  - ◆ **absorption**
  - ◆ **metabolism**
  - ◆ **direct loss**

## **Key messages (2)**

- **Food intake may be affected by cultural practices**
- **Loss of appetite is a major barrier to nutritional management of diarrhoea**