

# Infant and child Nutrition

Prof Dr Najlaa Fawzi



# INFANT NUTRITION

**Optimal nutrition is critical in the first year because**

- **The baby's organs are developing**
- **The nervous system continues to develop**
- **Babies typically grow 10 inches in length and triple their weight in the 1st year**



# Infant and Child Feeding

## Global Strategy for Infant and Young Child Feeding

**The aim of the Global Strategy is to improve – through optimal feeding – the nutritional status, growth and development, health, and thus the survival of infants and young children.**

**It supports exclusive breastfeeding for 6 months, with timely, adequate, safe and appropriate complementary feeding, while continuing breastfeeding for two years and beyond.**

**It also supports maternal nutrition, and social and community support.**

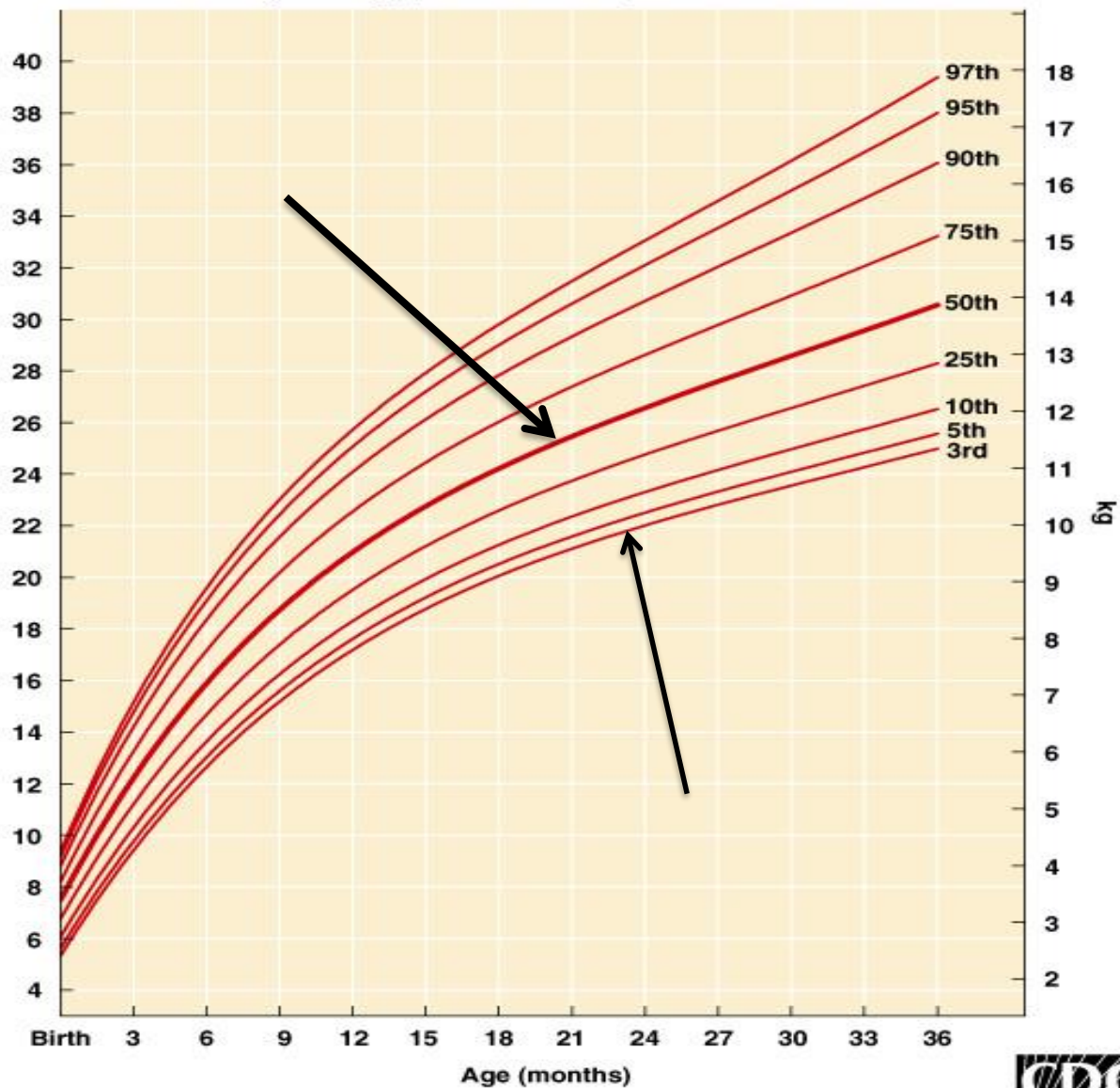


# Growth in Infants

- **Rapid body growth and brain development during the first year:**
  - **Weight increases 200%**
  - **Body length increases 55%**
  - **Head circumference increases 40%**
  - **Brain weight doubles**



Weight-for-age percentiles: Girls, birth to 36 months



Infants' nutritional needs are unique because

- **Their energy needs are high to support rapid growth**
- **Their digestive tracts and kidneys are still immature**
- **They are small in size**



# Major Determinants of Caloric Needs

- **Basal metabolic rate (BMR)**
- **Growth (2x BMR during first year)**
- **Stress (infection, illness)**



# Infants need

- **50 kcal per pound(450g) of body weight /day**
- **At least 40% of calories from fat**
- **No more than 20% of calories from protein**
- **2 ounces(60ml) of fluid per pound of body weight**





**The WHO, suggested that infant receive [108Cal/kg/day] for the 1st 6months; and [98Cal/kg/day] from 6months till the 1st birthday, which is relatively large during childhood.**



**Babies should not have restricted fat intake, human milk in fact is high in cholesterol & fat content , 45 g of fat / liter .**

**Omega-3 fatty acids are plentiful in human milk, particularly if the mother includes fish in her diet on regular basis, these fatty acids have been found to be essential for proper brain & nervous system development.**



# Protein

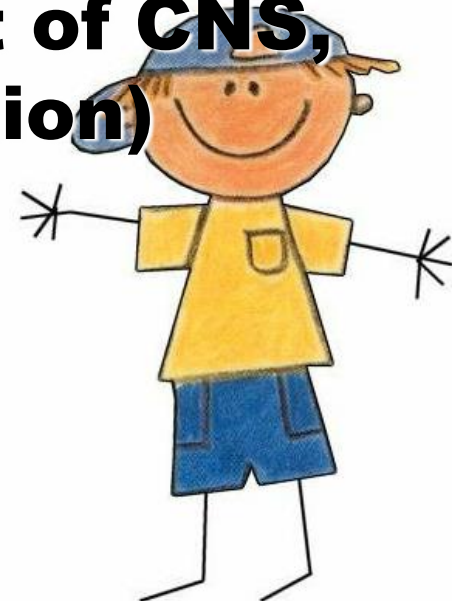
The requirement is highest during the first 4 months of life, when growth is the most rapid [2.2g/kg/day] from birth to 6 months of age and [1.6g/kg/day] for the second half of the year.

**Fat** is a backup energy source and also supplies **Linoleic acid**, which necessary for growth



# BREAST MILK COMPOSITION

- **Fat** (4% concentration provides up to 50% of caloric needs, cholesterol levels constant, lipolytic enzymes aid in fat digestion)
- **Carbohydrates** (lactose = milk sugar predominantly in human milk, 7% concentration provides up to 40% caloric needs, essential for development of CNS, enhances calcium & iron absorption)



- **Carbohydrates** (Bifidus factor = growth factor present only in human milk required for establishing an acidic environment in the gut to inhibit growth of bacteria, fungi and parasites)

- **Protein**

- Lactoferrin => Isolates external iron

- Secretory IGA => Most important immunoglobulin, breast milk = only source for first 6 weeks



- **World Health Organization (WHO) recommends breastfeeding for at least the first 2 years.**
- **Breast milk or formula should be supplemented with solid food beginning at 4 to 6 months.**



# **Infants should not eat**

- **Foods they could choke on**
- **Corn syrup or honey**
- **Goat's milk**
- **Cow's milk**
- **Large quantities of fruit juice**
- **Too much salt or sugar**
- **Too much breast milk or formula**



# **Nutrition-related concerns for infants include**

- **Allergies**
- **Dehydration**
- **Colic**
- **Anemia**
- **Nursing bottle syndrome**
- **Lead poisoning**





# Allergies

- **Solid food should be introduced one at a time for a week to watch for allergies**

# Dehydration

- **Extremely dangerous for infants**
- **Caused by diarrhea, vomiting, inadequate fluid intake**
- **Pediatric electrolyte solution may be used**



## **Colic**

- **Uncontrollable crying that can last for hours**
- **Precise cause is unknown**

## **Anemia**

- **Infants are born with enough iron for only 6 months**
- **Anemia can develop after that**



# Nursing Bottle Syndrome

- **Leaving an infant alone with a bottle can lead to cavities and tooth decay**
- **Rather than a bottle, begin using a cup by 8 months and no bottle after 18 months**




# Lead poisoning

- **Especially toxic to infants since the brain and nervous system are still developing**
- **Results in reduced mental capacity, behavioral problems, impaired growth**
- **Remove old lead based paint???**
- **Allow tap water to run a minute before use to discard lead leached from pipes???**







# Food Pyramid For Healthy Toddlers



Fats and Sugar  
(Ghee, Oil, Butter, Sugar and Jaggery)



Dairy Products  
(Milk, Yogurt, Cheese, Paneer)  
(2 Servings)



Fruits, Vegetables and  
Leafy vegetables  
(2-3 Servings)



Grains, Cereals  
Pulses  
(5-6 Servings)

# The Food Pyramid for Children

Ages approx. 4 - 8

Fats n' Sugars  
sparingly



Dairy 2 1/2 cups  
(20oz.)



Meats 4 oz.



Veggies  
1 1/2 cups



Fruits 1 to  
1 1/2 cups



Grains 5 oz.



# THE FOOD PYRAMID ACCORDING TO Kids

## BREATH & GAS GROUP

Eat as needed for  
desired effect



## GROSS GROUP

Eat sparingly, preferably  
with witnesses

## PORTABLE GROUP

2-3 servings



## BEVERAGE GROUP

6-8 servings



## CONDIMENT GROUP

6-8 servings



## INEDIBLE GROUP

Only when you *can't resist*



## YUMMY GROUP

10-30 servings



## CHOCOLATE GROUP

As many servings  
as you can get



## "I WILL NOT EAT THIS" GROUP

0 servings



**Overweight** is defined as the percentage of children aged 0 to 59 months whose weight for height is above two standard deviations (overweight and obese) or above three standard deviations (obese) from the median of the WHO Child Growth Standards.



## **Preventing Overweight in Infants and Toddlers**

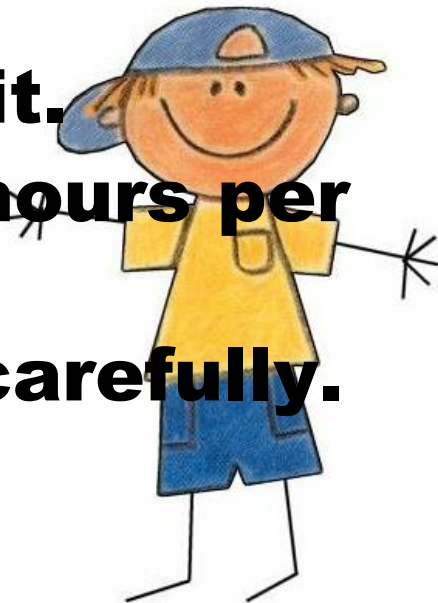
- **Avoid overfeeding.**
- **Do not force infants to eat.**
- **Wait until 4-6 months before adding solid foods.**
- **Limit juice to 3-4 ounces.**
- **Do not use food as a reward.**
- **Encourage physical activity.**





# Developing Healthy Habits

- **Offer a variety of healthy foods and snacks.**
- **Encourage fruit and vegetable intake.**
- **No junk food snacking.**
- **Limit intake of juices ( 4 oz. per day).**
- **Increase intake of water (no soda).**
- **Encourage low fat dairy products (3-4 servings/ day).**
- **Make fun physical activity a habit.**
- **Limit TV to no more than 1 to 2 hours per day.**
- **Track growth and development carefully.**
- **Be a good role model.**



# School-age Nutrition Needs

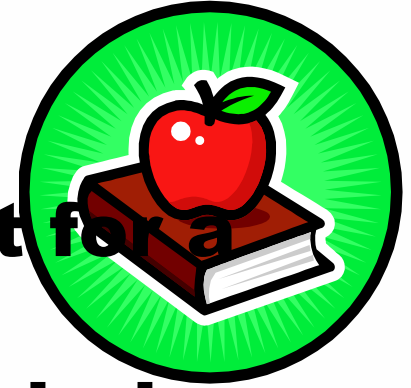
- **Follow Food Pyramid.**
- **6-11 year olds need 1,200 to 2,200 calories depending on age, gender and activity level.**
  - **In general, boys require slightly more than girls and active kids require more than inactive kids.**



- **Children need to make their own food decisions**
- **Breakfast – Breakfast – Breakfast**
  - **A well-nourished child is ready to learn.**
  - **Regular breakfast skipping is linked to less school achievement and performance.**
  - **Kids who eat breakfast are less likely to be overweight and more likely to get enough calcium.**
- **Beating the time barrier**
  - **Keep quick-to-fix healthy foods on hand: ready-to-eat whole-grain cereals, breads; yogurt, fresh fruit, low-fat milk and cheeses, peanut butter.**



# Snacks



- **Important part of a balanced diet for a child .**
- **Growing kids need extra energy during the day to support growth and development .**
- **Planning can help ensure that snacks eaten will be healthier ones .**
- **Can cut down on feelings of hunger and less likelihood of overeating at mealtimes .**
- **Keep serving sizes in mind as well as nutrient density .**
- **Keep in mind to choose those that are low in fat, added sugars and calories .**



# Definitions of anthropometric indicators

**stunting reflects chronic undernutrition during the most critical periods of growth and development in early life.**

**It is defined as the percentage of children aged 0 to 59 months whose height for age is below minus two standard deviations (moderate and severe stunting) and minus three standard deviations (severe stunting) from the median of the WHO Child Growth Standards**

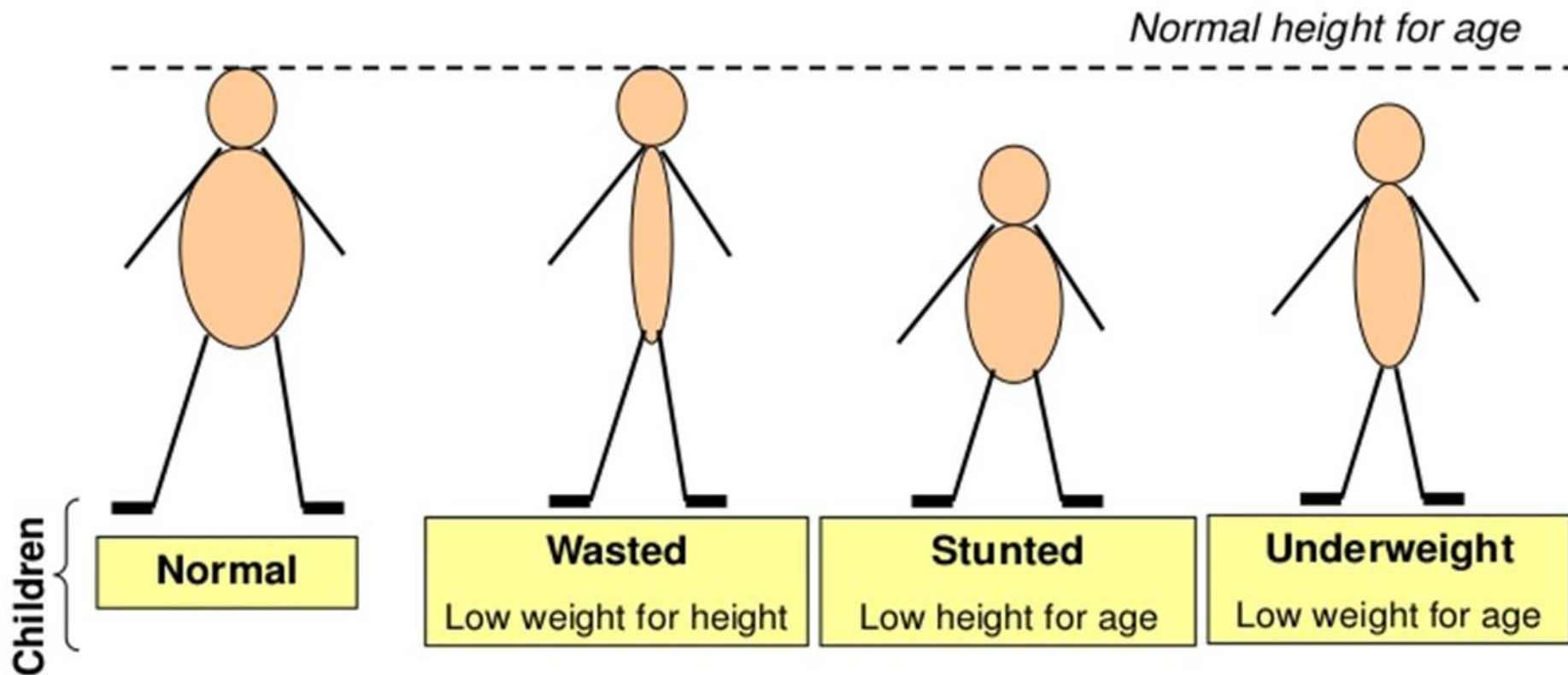


**Underweight** is a composite form of undernutrition that includes elements of stunting and wasting. It is defined as the percentage of children aged 0 to 59 months whose weight for age is below minus two standard deviations (moderate and severe underweight) and minus three standard deviations (severe underweight) from the median of the WHO Child Growth Standards.

**Wasting** reflects acute undernutrition. It is defined as the percentage of children aged 0 to 59 months whose weight for height is below minus two standard deviations (moderate and severe wasting) and minus three standard deviations (severe wasting) from the median of the WHO Child Growth Standards

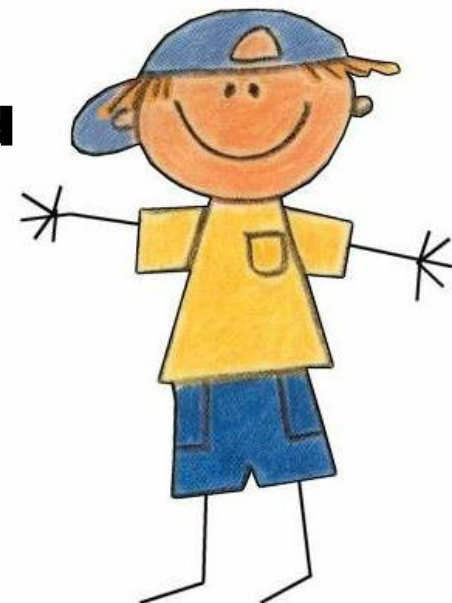


# Different Types of Childhood Malnutrition



**Nutrition-specific interventions** are actions that have a direct impact on the prevention and treatment of undernutrition, in particular during the 1,000 days covering pregnancy and the child's first two years nutrition-specific interventions. Taking a life-cycle approach, the activities fall broadly into the following categories

- **Maternal nutrition and prevention of low birthweight**
  - • **Infant and young child feeding (IYCF)**  
**Breastfeeding, with early initiation (within one hour of birth) and continued exclusive breastfeeding for the first six months followed by continued breastfeeding up to 2 years**





- **Safe, timely, adequate and appropriate complementary feeding from 6 months onwards**
- **Prevention and treatment of micronutrient deficiencies**
- **Prevention and treatment of severe acute malnutrition**
- **Promotion of good sanitation practices and access to clean drinking water**
- **Promotion of healthy practices and appropriate use of health services**

