Toddler and Preschooler Nutrition: Conditions and Interventions

NUTD 239

Chapter 11

Children with special health care needs

A general term for infants and children with, or at risk for, physical or developmental disabilities or chronic medical conditions from genetic or metabolic disorders, birth defects, premature births, trauma, infection, or prenatal exposure to drugs

→ The sooner special educational, nutritional, and health care interventions are started, the better for the overall development of the child

Eligibility for services does not require a specific diagnosis, ***early intervention services*** are based on the following:

- Developmental delays in one or more of the following areas- cognitive, physical, language and speech, psychosocial, or self-help skills
- A physical or mental condition with a high probability of delay, such as Down syndrome
- At risk medically or environmentally for substantial developmental delay if services are not provided

Nutrition needs of toddlers and preschoolers with chronic conditions

- DRIs are available as a starting point
- Children with specific conditions→ *standard nutrition guidance does not apply e.g., sickle cell anemia*

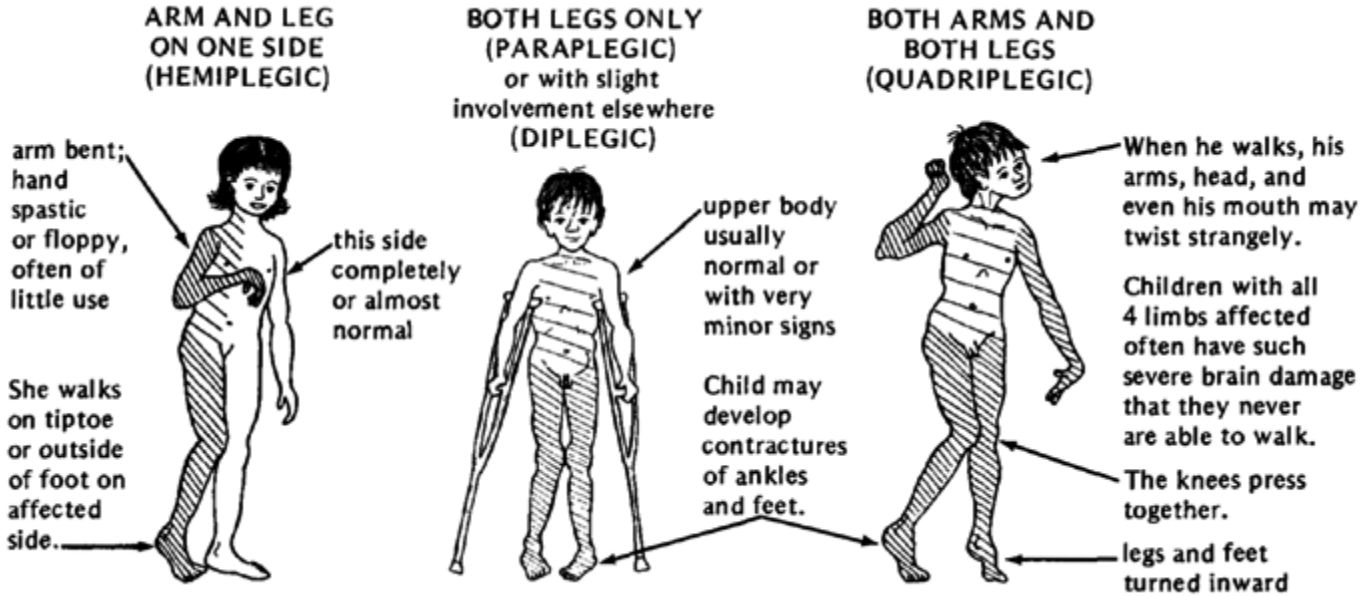
  Selecting iron rich foods to increase iron stores might become inappropriate when they take blood transfusions that are also rich in Fe- NEED TO COSTOMIZE NUTRITIONAL NEEDS

- **Cystic Fibrosis:** genetic disease that causes persistent lung infections and limits the ability to breathe over time. Defective gene causes a thick buildup of mucus in the lungs, pancreas, and other organs

- **Diplegia:** condition in which the part of the brain controlling movement of the legs is damaged, interfering with muscle control and movement

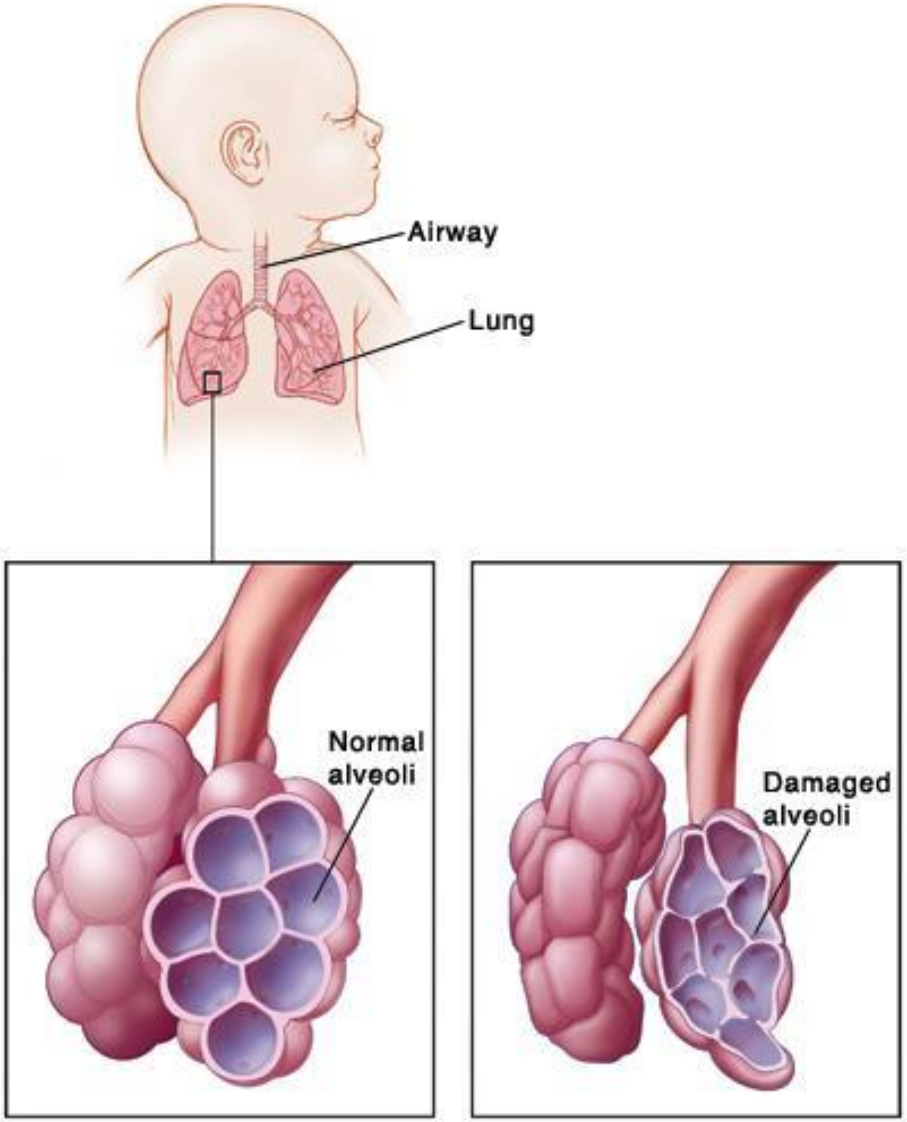
- **Pediatric AIDS:** the human immunodeficiency disorder (HIV) causes acquired immunodeficiency syndrome (AIDS)- severely diminished immune system function/ body is highly vulnerable to infections

Diplegia


ARM AND LEG ON ONE SIDE (HEMIPLEGIC)
arm bent; hand spastic or floppy, often of little use
this side completely or almost normal
She walks on tiptoe or outside of foot on affected side.
BOTH LEGS ONLY (PARAPLEGIC) or with slight involvement elsewhere (DIPLEGIC)
upper body usually normal or with very minor signs
Child may develop contractures of ankles and feet.
BOTH ARMS AND BOTH LEGS (QUADRIPLEGIC)
When he walks, his arms, head, and even his mouth may twist strangely.
Children with all 4 limbs affected often have such severe brain damage that they never are able to walk.
The knees press together.
legs and feet turned inward

- **Prader-Willi Syndrome:** condition in which partial deletion of chromosome 15 interferes with control of appetite, muscle development, and cognition.
  - Child becomes constantly hungry which often leads to obesity and type II diabetes

- **Bronchopulmonary Dysplasia (BPD):** a form of chronic lung disease that effects newborns (mostly premature) and infants- results from damage to the lungs due to use of mechanical ventilation and long-term use of oxygen- most recover from it but some may have long-term breathing difficulty



Normally, air flows easily through the bronchioles (small airways) in and out of the alveoli (air sacs). Scarring can constrict the airways and keep air sacs from opening fully.

Table 11.1 Chronic conditions generally associated with high and low caloric needs

Higher Caloric Need Conditions	Lower Caloric Need Conditions
Cystic fibrosis	Down syndrome
Renal disease	Spina bifida
Ambulatory children with diplegia	Nonambulatory children with *diplegia*
Pediatric AIDS	*Prader-Willi syndrome*
Bronchopulmonary dysplasia (BPD)	Nonambulatory children with short stature

Low muscle mass, low mobility and short stature- without lowering in caloric intake→ OW patients→ this affects overall health→ need to match caloric intake to specific needs

Each child must be assessed to confirm caloric needs (case-by-case)

- Chronic conditions may result in poor appetite although there are increased caloric needs→ may complicate nutritional intake

- A child may have an interval of needing additional calories based on the course of the chronic disease- this may explain why both underweight and OW are more common in children with chronic conditions
  - OW- Down Syndrome, spina bifida- due to lower caloric needs
  - Underweight- due to treatment, weight loss due to illness

- *Recommendations on food intake and mealtime behaviors should be customized to the individual child*
  - Children who are frequently sick or with low appetite may dislike foods that are hard to chew or take a long time to eat
  - Some food-intake problems related to chronic illness may result from the children's behavior
    - → This fact can make it difficult to distinguish between food-intake problems related to the chronic condition present and those related to "growing up"

Growth assessment

- **First step**: assessment of nutritional status to determine whether more intensive levels of nutrition services are needed
  - Is the child's growth on track?
  - Is her diet adequate?
  - Does the diagnosis affect nutritional needs?

Nutrition screening tools: to assess nutritional status of children at risk or diagnosed with chronic conditions such as HIV, asthma, allergies, celiac disease, breathing problems..

Diagnosis of status→ *choose nutrition intervention to improve nutritional status*

- *Children with special health care needs often have conditions that affect growth even when adequate nutrients are provided*
  - Interpret growth chart based on the child's previous growth pattern
  - Thin, small appearing child with adequate fat stores- considered as having a healthy growth pattern- adding more calories may promote OW
  - Growth patterns can also be affected by use of medications esp those containing steroids may affect body composition- should consider this as a factor

- Specific growth charts for chronic conditions when available are recommended to be used
  - LBW, VLBW (up to 38months): Infant Health and Development Program growth percentile charts- with correction for prematurity
  - Head growth charts (HC percentile from birth-18yrs): to determine whether head growth falls within normal limits or indicates neurological condition such as:
    - Rett Syndrome: genetic disorder- reduced rate of head growth beginning in toddler yrs, severe neurological delays cause children to be short, thin- appearing and unable to talk

Feeding problems

- Can include regular issues such as using food to control parents behavior or food jags
- Feeding problems (may emerge in the toddler and preschool yrs) typical in children later diagnosed with chronic conditions can include:
  - Gastroesophageal reflux
  - Pulmonary problems including asthma
  - Developmental delay
  - Autism
  - Attention Deficit Hyperactivity Disorder
- *Feeding problems include:*
  - Low interest in food or food refusal
  - Long mealtimes (>30mins)
  - Preference of liquid food over solid items
  - Food refusals

There might be a need to treat a child as younger than their chronological age- e.g., food texture choice

See example page 295

Behavioral feeding problems

- Behavioral disorders that affect nutritional status include autism and ADHD:

- **Autism**: usually self- restricted
  - Refusal of many foods
  - Inflexible with food variability
  - Does not respond to feeling hungry
  - If not provided with food that he wants- refusal of food; temper tantrums in which he can injure himself
  - Preference of drinking over eating solid foods

Nutrition intervention may include:

- Complete vitamin and mineral supplement
- Adding ONE new food by offering it many times (15-20 times/ over 1-2 mos

Table 11.3 Dietary intake of 2-year-old child with suspected autism

Dry Fruit Loops cereal
10 fl oz calcium-supplemented orange juice drink
Chicken fingers from a specific fast-food restaurant
French fries
10 fl oz calcium-supplemented orange juice drink
Waverly crackers
Pringles potato chips
10 fl oz calcium-supplemented orange juice drink
Oatmeal cake
10 fl oz calcium-supplemented orange juice drink

Excessive fluid intake

- Young children prefer liquids than solid foods esp when they do not feel well

- Families of chronically ill children tend to offer juices and lower nutrient dense beverages to achieve growth when eating is difficult
  - Excess juice resulting in a pattern of low milk intake has been documented to result in smaller stature and lower bone density which is exacerbated if activity level is low
    - Ca- fortified juices are an option if other sources of Ca are limited- but can be over consumed
  - AAP: limit juice intake to 4-6ouces/ d for ages 1-6 years for all children

Feeding problems from disabilities involving neuromuscular control

- Conditions include: cerebral palsy and other neuromuscular disorders and genetic disorders like Down syndrome
- Feeding problems are related to muscle control of swallowing or control of the mouth and upper body-
  - may lead to coughing, choking, refusal of food that require chewing–*more severe than a reaction of an infant learning how to chew foods*
- A child with hypotonia or hypertonia in the upper body may experience difficulty sitting for a meal and self-feeding with a spoon
- Decrease in appetite- eating is difficult and unpleasant

There is a need to resolve feeding problems by providing therapy in *early-intervention programs or schools* to avoid resistance of eating by the child over time

If that occurs- nutrition support such as gastrostomy becomes necessary

Nutrition- Related Conditions

Failure to thrive FTT

- Condition in which caloric deficit is suspected
  - Suspected when child's growth declines by > 2 growth percentiles→

    Placement near or below the lowest percentile in weight for age, wt for length, and or BMI

**** may have grown adequately during the first year**

FTT can be the result of multiple factors including medical and environmental ones:

- Digestive problems such as GI reflux or celiac disease
- Asthma or breathing problems
- Neurological conditions such as seizures
- Pediatric AIDS

High risk of FTT in preterm children or those who have chronic illnesses- *due to abuse or medical neglect*→ they have greater needs; may be more demanding and irritable

- Focus in intake should be on **total E and protein**

- Catch- up growth is possible if adequate calories (usually more than is typical for that age) are provided
  - Time needed for catch-up growth varies between individuals
  - Some wt gain should be present within a few wks

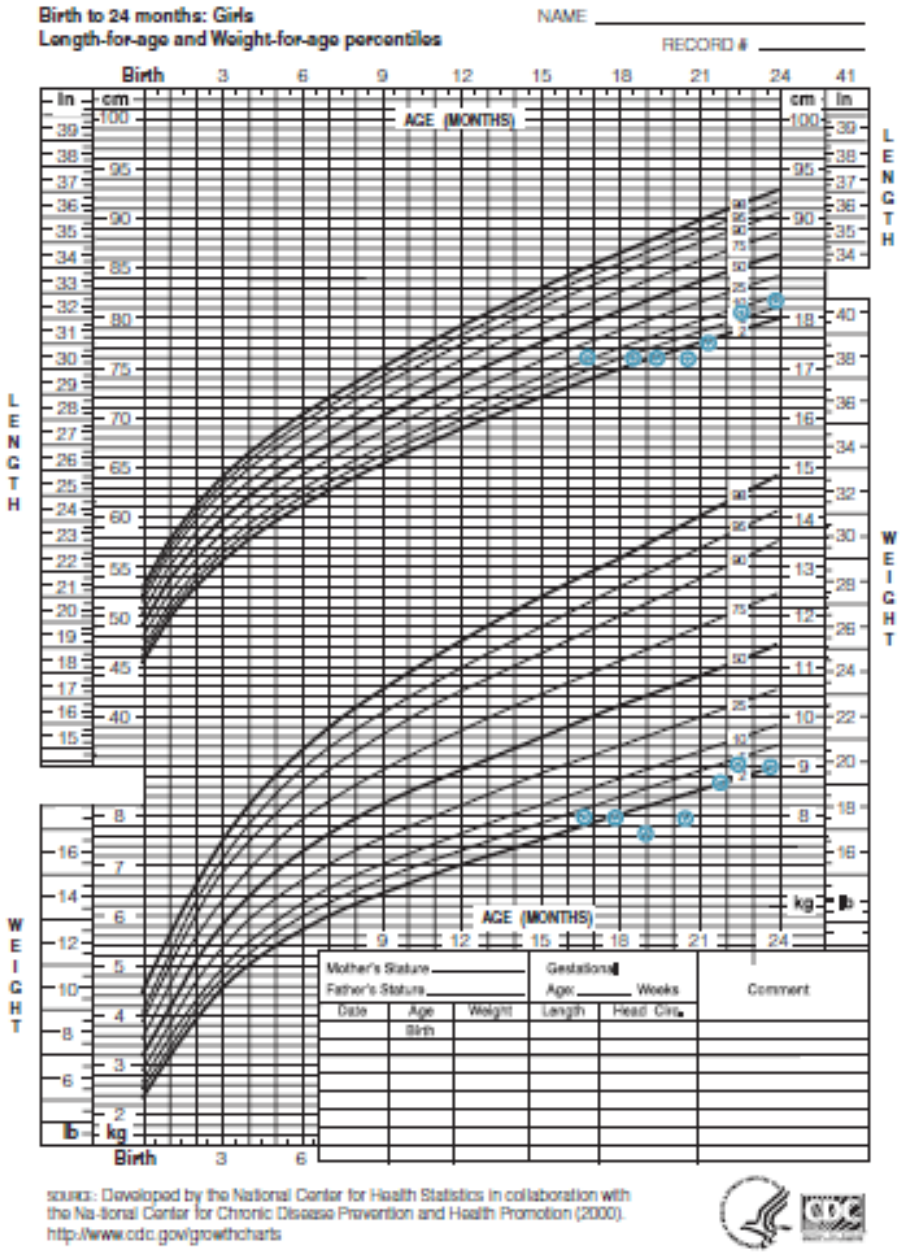


ILLUSTRATION 11.3 ▸ Growth chart for a girl with failure to thrive before and after intervention.

- **Obesity and overgrowth syndromes** (opposite of FTT) have been identified for this age grp- different than typical childhood obesity

- E.g., Weidemann- Beckwith syndrome: unusual high rate of wt gain in toddlers → not due to excessive E intake but of endocrine or metabolic abnormalities, body composition changes, or drug side effects

Toddler diarrhea and celiac disease

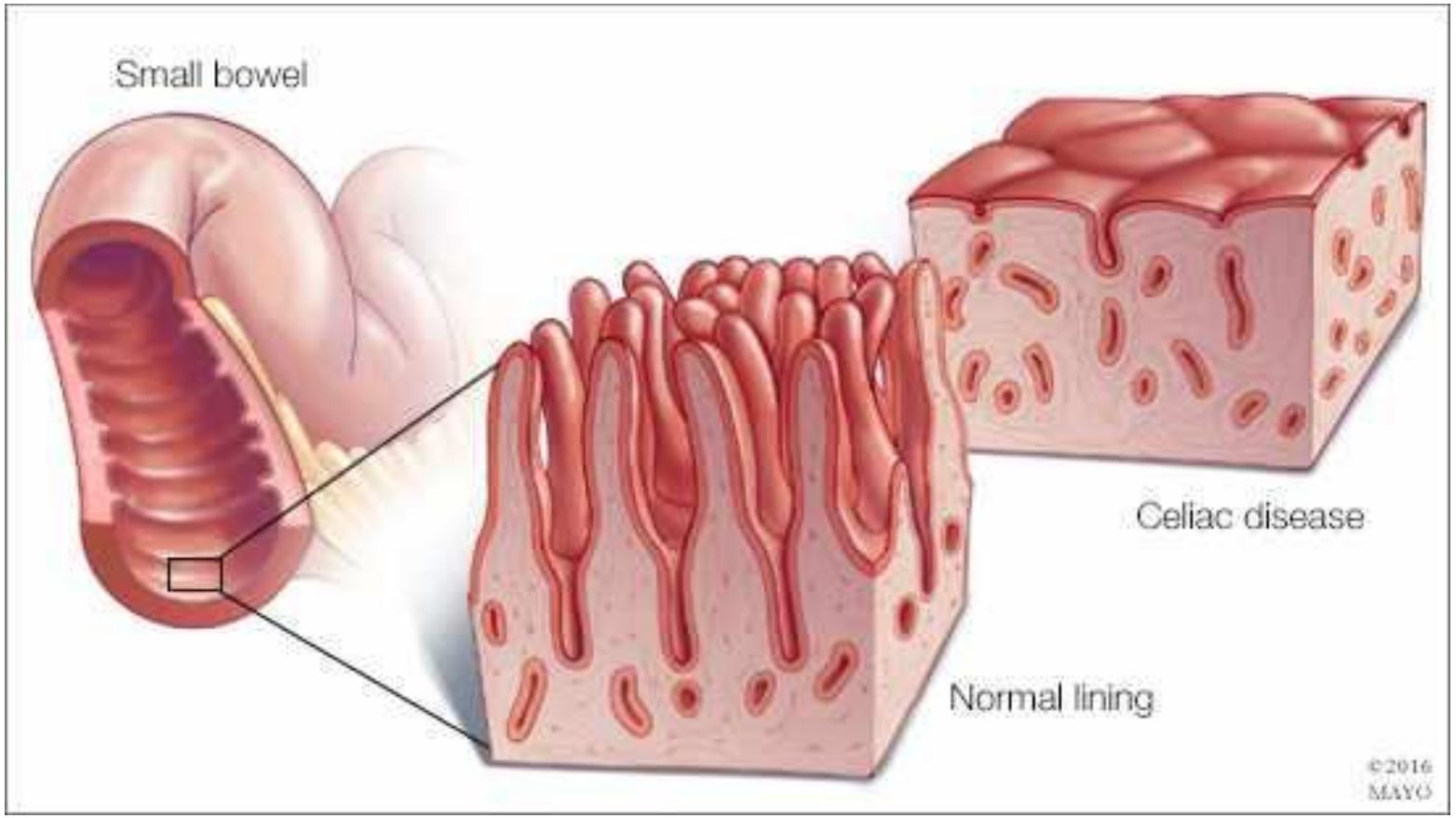
- ***Toddler diarrhea-***
  - Healthy growing children with recurrent diarrhea
  - Tests show no intestinal damage, normal blood levels, no FTT or wt loss

→Reason: excessive intake of juices with sucrose or sorbitol- water pulled into intestine-> LIMIT intake

Celiac disease:

- Sensitivity to gluten- in wheat, rye, and barley
- May be related to other chronic conditions including DS, management of cancer by certain chemotherapy regimens
- Symptoms usually develop by 2 yrs of age
- Confirmation of condition: test blood for gluten antibodies
- Management: gluten-free diet for life→ intestine heals and symptoms disappear
- Food allowed: oats (careful for contamination) meat, vegetables, fruits, rice, soy, corn and potato flours

Celiac disease



Autism

- Behavioral signs show during toddler and preschool years
- Early screening is recommended by the AAP for children with suspected speech delays, repetitive behaviors, and social skill deficits
- Average age for diagnosis- 30 months (2.5yrs)
- Preschoolers with autism are sensitive to sensory information→ results in inflexible, self-restricted food choices: adequacy of diet can be jeopardized
- GI problems are often reported by parents
- *Dietary recommendations are same for any child of same age who has feeding problems*

Muscle coordination problems and cerebral palsy

- **Cerebral palsy:** general term for a number of neurological conditions that affect movement and coordination

- Preterm births account for much of the increase in muscle coordination problems before cerebral palsy can be diagnosed

- **Nutrition assessment** is necessary for individuals at risk or with confirmed cerebral palsy
  - Example- assess fat stores (body composition)
    - found low: **intervention** would be to encourage weight gain
- Part of **growth assessment** for patient with cerebral palsy includes estimating caloric needs for activity- may be higher or lower than expected
  - High E is expended in effort to coordinate walking→ need more calories than if activity is low or patient is on a wheelchair

- Children with **muscle coordination problems** may appear thin due to small muscle size and not low fat stores- *wt gain would not be needed here*

- Growth tracking may not fit CDC growth charts nor spastic quadriplegia growth charts
  - → Use of Infant Health and Development Program growth charts

- *Lack of clear diagnosis- delay of appropriate nutrition services> growth and feeding problems worsen*

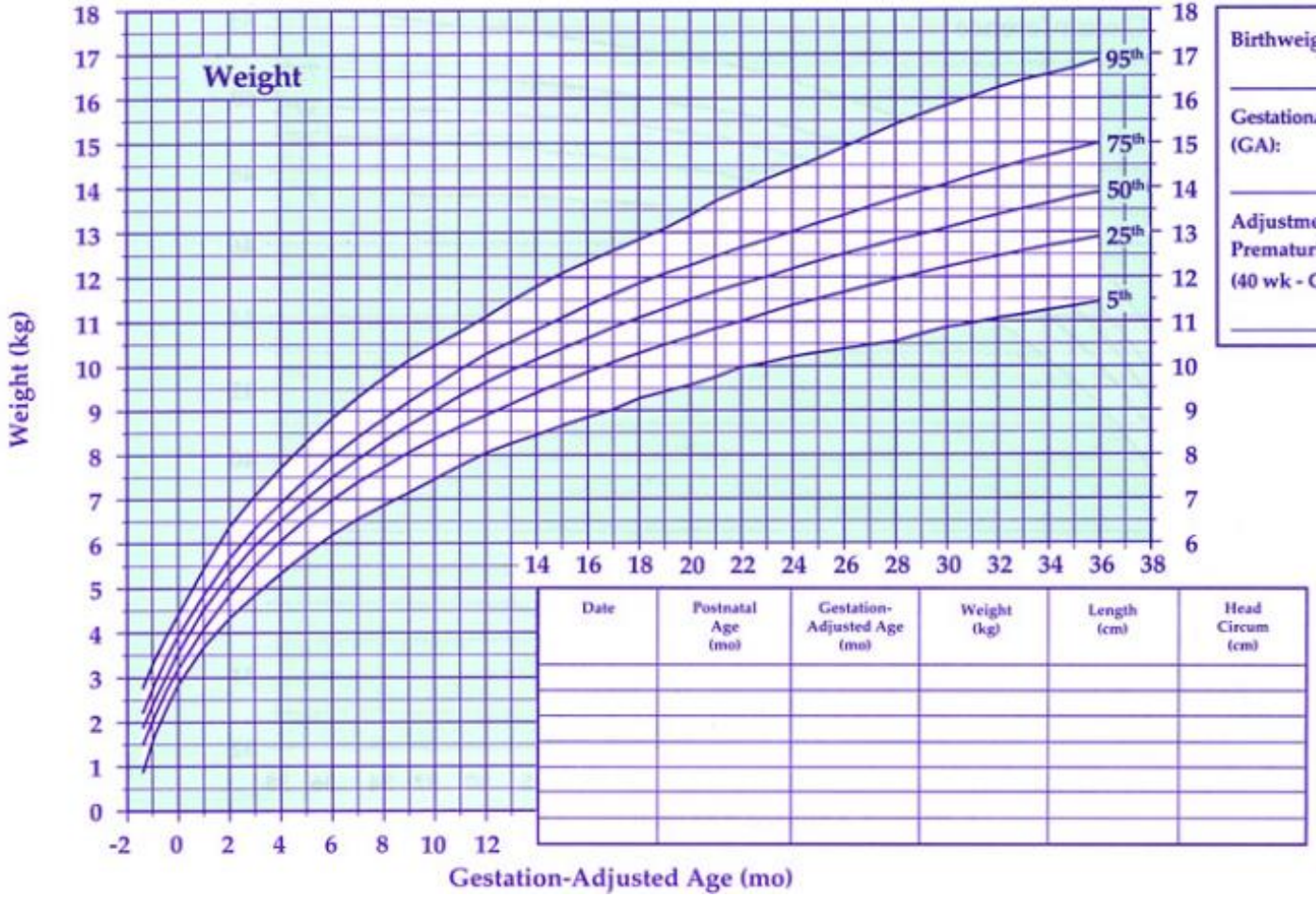
IHDP Growth Percentiles: LBW Premature Boys[1,2]

(1501 to 2500 g BW, ≤37 wk GA)

Name_____

Record #_____

ROSS PEDIATRICS



Birthweight (BW):

_____g

Gestational Age (GA):

_____wk

Adjustment for Prematurity (40 wk - GA):

_____wk

Date	Postnatal Age (mo)	Gestation-Adjusted Age (mo)	Weight (kg)	Length (cm)	Head Circum (cm)

Feeding assessment with severe cerebral palsy (spastic quadriplegia)

- Observation of eating to determine:
  - Any food restrictions
  - Whether coordinating muscles for chewing, swallowing, and/or using a spoon or fork are working well

Pulmonary problems

- Breathing conditions are common problems in children with special health care needs:
  - Increase nutritional needs (due to extra E expended in breathing)
  - Increased work of breathing-lower interest in eating partially due to tiredness
  - Can slow growth rate
- Examples of pulmonary diseases or chronic lung diseases include bronchopulmonary dysplasia (BPD) and asthma
- *Preterm birth is a risk factor*

- Feeding difficulties have several causes in a toddler treated for BPD:
  - Normal progression of feeding skills is interrupted
  - Medications and their side effects contribute to high nutrition needs
  - Interrupted sleep and fatigue make hunger and fullness cues harder to interpret

- Impact of BPD on slowing rate of growth is clear by preschool yrs
- Increased frequency of infections- add limitation to catch- up growth
- Neither the CDC growth chart nor the IHDP preterm growth chart may be helpful in predicting the child's growth pattern→ periods of good health are usually accompanied by increase in appetite and wt gain

Dietary recommendations:

- Small, frequent meals with foods that are concentrated sources of calories
- Easy-to-eat foods-→ so that fatigue from meals is low

- If wt gain does not occur with these recommendations- add complete nutritional supplements to meet the higher caloric needs

  E.g., Pediasure supplement- source of vitamins and minerals

- **Asthma** does not require nutrition services- *but it would when it is a result of food allergies*

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PediaSure®

Nutrition to Help Kids Grow

A trusted brand in more than 80 countries worldwide, PediaSure is a scientifically designed formula with 37 Nutrients* which provides complete, balanced nutrition. PediaSure is scientifically shown to support healthy growth and development.

Nutritional Facts* (Approximate Composition)	Powder (per 100 g)
ENERGY	462 kcal
Protein	14.1 g
Carbohydrate	62.74 g
Sugar (sucrose)	23.77 g
Fat	17.0 g
Saturated fatty acids	3.22 g
Monounsaturated fatty acids	7.18 g
Polyunsaturated fatty acids	5.29 g
Trans fatty acids	0.22 g
Cholesterol	<30 mg
Calcium$	386 mg
Phosphorus$	240 mg
Magnesium$	78 mg
Vitamin D_2#	3.15 mcg
Vitamin K#	17.5 mcg
Inositol	32.0 mg
Sodium$	181 mg
Potassium$	512 mg
Chloride$	394 mg
Molybdenum$	19.7 mcg
Manganese$	0.98 mg
Chromium$	12.0 mcg
Vitamin B_1#	0.90 mg
Vitamin B_2#	1.00 mg
Niacin#	7.0 mg NE
Vitamin B_6#	1.00 mg
Pantothenic acid#	3100 mcg
Biotin#	16.0 mcg
Carnitine	6.7 mg
Vitamin A#	305 mcg RE
Vitamin C#	44.0 mg
Vitamin E#	11.0 mg α-TE
Zinc$	3.5 mg
Selenium$	12.3 mcg
Copper$	400 mcg
FOS	1.58 g
Linoleic acid	3500 mg
Alpha Linolenic acid	380 mg
Vitamin B_{12}#	1.50 mcg
Folic acid#	100 mcg
Iron$	5.5 mg
Iodine$	38 mcg
Choline$	118 mg
Taurine	28.0 mg

Total Saturated fat content not more than 14.14 percent by weight.
Total Trans-fat content not more than 0.70 percent by weight.

SERVING INSTRUCTIONS

	Quantity (ml)	Scoops of powder	Number of servings recommended
Water~	190	5	2-3
Whole cow's milk	150	2	2-3
1 Scoop equals 9.1 g of PediaSure powder		~Claims are applicable to the preparation in water.	

Once mixed, PediaSure should be consumed immediately.
Otherwise please cover, refrigerate and drink within 24 hours.
When mixed as directed, PediaSure provides 0.94 kcal per ml.
Also tastes delicious with milk.

This food is by its nature gluten-free.
Not for children with galactosemia or lactose intolerance.
Not for parenteral (intravenous) use.
NOT FOR MEDICINAL USE
The product can be consumed without medical advice.
Please store the product out of reach of children.

INGREDIENTS: Skim milk powder, sucrose, edible vegetable oil (soy oil, high oleic sunflower oil), maltodextrin, medium chain triglyceride (MCT) oil, fructo-oligosaccharides (FOS) (2%), flavoring, MINERALS$, VITAMINS#, m-inositol, taurine, *Lactobacillus acidophilus* (0.01%), L-carnitine, *Bifidobacterium lactis* (0.0035%)

CONTAINS ADDED FLAVOR (Artificial Flavoring Substances - Vanilla)

This product is not an infant milk substitute or infant food | For children above 2 years of age.

STORAGE INSTRUCTIONS:
This box contains a sealed foil pouch. On opening this pack, transfer the foil pouch immediately into a suitable air-tight container. Once foil pouch has been opened, contents should be used within three weeks. For extra protection, continue to keep the foil pouch inside the container. Keep the container closed after use. Store in a cool, dry place (not in refrigerator).

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Food allergies

- Identified at this stage because allergy testing at infancy is not *useful- incomplete development of the immune system*

- True food allergies can result in **anaphylaxis**: sudden onset of a reaction with mild to severe symptoms, including a decrease in ability to breathe, which may be severe enough to cause a coma
  - Parents should be instructed on emergency lifesaving procedures and use of injectable form of epinephrine

- 8 most common allergens:
  - Milk
  - Eggs
  - Wheat
  - Peanuts
  - Walnuts
  - Soy Fish
  - Crustacean shellfish
- Food that causes the allergy should be completely avoided
- Extreme restrictions can lead to nutritional deficiencies and problem behaviors at mealtime