Lecture 4

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Community Notes

Topic: Childhood
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These notes are written as bullet points from the slides with the additional notes added by the doctor next to each and every point. There is no need to study these sheets along with the slides as I have copied all the information from the slides in here.

Anything marked with asterisks (**) are of high importance. There is a good chance the Doctor would get questions from those. Also, pay attention to the words underlined or made in bold.

Best of luck. Your feedback would be highly appreciated.

Slide1: Childhood
(child stages or child development)
Very important

- Toddlers 1-3 years
- Preschool children 3-5 years
- School- age children 5-12 years
- Adolescence 12-18 years

Slide2: Nutrition in childhood

- Nutrition requirements are affected by a generally slowed and erratic growth rate between infancy and adolescence and a child individual needs.
- A child food choices are determined by numerous family and community factors.
- Nutrition intake and developing food patterns in young children are governed by food availability and food choices.
- Consideration in feeding young children are guided by meeting physical and psychosocial needs.
- Nutrition concerns during childhood relate to growth and development needs for positive health.

**This slide was not discussed by the doctor because we will come to its details in the upcoming slides during this lecture.

Slide3: Childhood Growth and Development

- Growth patterns: growth spurts, appetite
  -we will discuss after this slide how **growth rates differ from the infancy period to the childhood period.**
  -Appetite: our appetite very much determines how much we eat.

- Catch-up growth: after illness or undernutrition.
  -The doctor notices a decline in the child's growth and warns the mother of this problem to feed her child better so the child can go back on the right track of proper and healthy growth.
- Assessing growth: **CDC growth charts**, growth channels:

  How does the doctor know whether the child's growth is normal or not? By assessing the child via charts and graphs. Age, weight, height are taken from the child. Charts are put by CDC (Center for Disease Control) founded by WHO in Atlanta, Georgia. This center is responsible for the infectious diseases and keeping track of them. It is also responsible for the **growth charts.
  Height of the child is measured by the **recumbent growth**. This is done by extending the child's legs to measure height from head to toe.

  Then, the nurse measures the weight. Now, both units (Recumbent height and weight of child) are put on a chart. The values we get are in the form of percentiles. From these values, we can know the catch-up growth. And also we can detect cases when the child's growth is normal or when the child fails to thrive: meaning when the child fails to grow. Any value above 60% indicates normal growth for a child.

Slide4: Physical growth during childhood

- **Growth Rate: The rapid rate of growth during infancy is followed by a deceleration during the preschool and school-age years.
  **You HAVE to know the difference between the growth rates for infants and children.
  Growth for INFANTS is rapid.

Growth for CHILDREN is slow and steady.
**it is very imperative that we give the young ones all the sufficient nutrients (carbohydrates, protein, fat) and NOT give them special diets, such as all-protein diet or low fat diet. Special diets are applicable for adults only as they might damage the child.

- Weight gain approximately 1.8 to 2.7 kg per year. *(NOT important)*
- Length increases approximately 7.6 cm per year between 1 year and 8 years of age, then increases 5.1 cm per year until the pubertal growth spurt. (*NOT important)*
- **Between 6 years of age and the adolescent growth spurt, gender differences can be noted:
  -At the age of **6-years-old**: **Males** tend to be heavier and taller than females
  -At the age of **10 and older** (BUT **before puberty**): **Females** tend to be taller and might be heavier also.
- At age 6 boys are taller and heavier than girls. By age 9 the height of the average female is the same as that of the 9-year-old male and her weight is slightly more.

Slide5: Growth charts

- The infants' growth charts are constructed to 36 months of age and should be used until the child is at least 24 months old: it is obligatory that we keep track of our children's health status by checking his/her weight, height, and growth patterns at the clinic until the age of **24 months**.
- Growth channel: the progressive regular growth pattern of children, guided along individual genetically controlled channels, influenced by nutritional and health status.

Slide6: Energy and Protein

- Energy needs determined on the basis of basal metabolism, rate of growth, and energy expenditure:
  1- Basal Metabolic Rate (BMR): it is the energy required to keep up the **basic functions** of the body, such as the cardiovascular system, respiratory system, gastrointestinal system, central nervous system and all the other systems in our body.

  2- Rate of growth: *(discussed earlier).* Rate of growth is dependent on the gender and age.
  I-Gender:
  **We mentioned that males at the age of 6 are heavier and taller than females BUT THEN the females become heavier and taller at the ages of 10 and above (before puberty).

  II-Age:
  We also mentioned that infants have a very **rapid growth rate, unlike children who have **slow yet steady** growth rate.

  3- Energy Expenditure: this varies from child to child. It is dependent on the activity of the child. For example, if the child is too active, we should supply him/her with more food/nutrients. If the child does nothing but watch TV, then it would make sense that he/she does not require that much of energy.

  4- Others: during pregnancy & lactation.

- The need for protein per kilogram of body weight decreases from approximately
  1.1 g (per kilogram of body weight) in early childhood to **0.95** g (per kilogram of body weight) in late childhood.
  **Notice that during early childhood, more proteins are required so that the child can be able to build the structures of his/her body and immunity.

Slide7: Recommended energy intakes for children

At age **1-3** years **102** kcal/kg/day
- (1300 kcal/day [this value is calculated by multiplying the weight of the child (in kilograms) by the energy intake]).

- At age **4-6 y**ears **90** kcal/kg/day
  - (1800 kcal/day).
- At age **7-10** years **70** kcal/kg/day
  - (2000 kcal/day).

  **Notice the decline in energy requirements as the child becomes older. You are only required to memorize the numbers in bold.

Slide8: Minerals and Vitamins

- **Children between 1 and 3 years of age are at high risk for iron deficiency: a.k.a anemia
- Calcium is needed for adequate mineralization and maintenance of growing bone
- **Zinc is essential for growth: VERY IMPORTANT (*mentioned in previous lecture*)
- Vitamin D is needed for calcium absorption and deposition in bone

Slide9: Malnutrition in children (VERY IMPORTANT)

- **Protein-Energy Malnutrition (PEM):
  a. **Kwashirchoire: deficiency of protein. When the baby is weaned, the child's protein intake will become less because the mother keeps feeding her child carbohydrates and sugars. Due to the deficiency of proteins in the baby's body, there will be swelling in certain regions of the body, such as the trunk, legs

and face. (The child's face will be like the moon: round and wide).

b. **Marasmus: deficiency of Protein **AND** energy.
   **Malnutrition has two types (I & II):
   I-overnutrition: taking too much nutrients. It is associated with obesity and over-weight.
   II-undernutrition: (our topic) it includes the protein-energy deficiency that we talked about above.

- *Vitamin A deficiency
- **Vitamin D deficiency: causes:
  1- **Osteoporosis: for females above 45 of age after menopause.
  2- **Osteomalacia: bones are destructed, calcium and phosphorus leaves the bones and you will notice many changes in the bone structure in the x-ray. This term is given for males and females from age 20-40
  3-**Rickets: for children.

- *Iron deficiency anemia
- **Zinc deficiency: important for the child growth. (Mentioned earlier in previous lectures; it is **VERY important)**
- **Lead toxicity: lead is found in the paint of the walls of buildings and houses. Children can eat the paint crumbles and get very high levels of lead in their body systems. Lead affects the child's body in a very bad way. Lead mostly affects the CNS (central nervous system) and causes problems such as behavioral disorders.

  -In <u>developed</u> countries, they do screening programs to detect the lead levels in the body.

Slide10: Standards for selected PEM indicators

- Serum total protein (g/dl) age 1-17 years deficiency is <5.5
- Serum albumin (g/dl) age 1-17 years deficiency is <2.8
- Total lymphocyte count (mm3) all ages deficiency is <1500
- Creatinine-height index 3 months to 17 years deficiency is <0.5

**This slide is not important. Don't memorize

Slide11: Vitamin-Mineral Supplements

- Fluoride and dental caries

At-risk groups: deprived families, parental neglect or abuse, anorexia or fad diets, chronic disease, weight-loss diets.
FAD diets: A food faddism is an eating regime that focuses on a particular food or food group (definition is from Wikipedia). Also, it is not scientifically proven to be healthy.

The right diet: is the balance in food intake. Your energy intake should be EQUAL to the energy expenditure.

- Avoid megadoses: this is applied for metals and vitamins. DO NOT take too much of metals or vitamins.
- Complementary nutrition therapies

Slide12: Intake Patterns

- Changes in food patterns over time: depending on the child's varying appetite.
- Family environment: the child's family is role model
- Societal trends: currently, we prefer fast food/fatty food over healthy, homemade food.
  The problem with fast food is that it is FULL of saturated fat and energy and very little in fibers and vitamins (except in the case when you order salad). Some restaurants might also put some certain chemicals in your food that makes you addicted to it so that you can come again and eat at the same place.
- Media messages: via TV advertisements, for example chips & fast-food
- Peer influence
- Illness or disease: appetite changes when the child is sick, so the intake of food decreases.

Slide13: Feeding Preschool Children

- Developmental progress: according to his age. Walking, memorizing words and numbers.
- Growth rate slows: (*mentioned before*) growth is slow and steady
- Parents control foods offered and set limits on inappropriate behaviors
- Importance of snacks: healthy snacks
- Portion sizes: we should always give the right portion size. We do not increase the portion size especially for the child. We take special care for the portion size because it will decrease the chances for the child to develop obesity.

Slide14: Feeding Preschool Children–cont'd (not important)

- Sensory factors
- Physical environment: *(not discussed by doctor*)
- Excessive intake of fruit juice: but not as much as the child wants
- Meals and snacks in day-care
- Peer influence

Slide15: Feeding School-Aged Children

- Slow steady growth
- Influence of peers and significant adults
- School lunch program: Present in the developed countries. At 11 am in the school's cafeteria, children are off for lunchtime, THEN at 11:30, it is naptime for 30 minutes.
- Special diets: we NEVER give special diets for children (such as diets high in protein OR diets rich in vitamins)
- Home-packed lunches: healthy food made at home.
- Importance of breakfast: breakfast is the most important meal of the day, especially for the child. Children take 30% of their daily energy from breakfast.
- Snacks: healthy snacks

Slide16: Overweight/Obesity

- Increasing prevalence
- Influence of access to food, eating tied to leisure activities, children making food decisions, portion sizes, and inactivity
- Consequences: discrimination, negative self-image, depression, decreased socialization: a child with a negative self-image is

mainly found in the developed countries where he is psychologically affected because of his weight.

- Increases cardiovascular risk factors (hyperlipidemia, hypertension, and hyperinsulinemia) and type 2 diabetes

Slide17: Interventions for Childhood Obesity

- Family involvement
- Dietary modifications: decrease fats in diet
- Nutrition information: educate the children on the right, proper healthy diet. We should educate them about the importance of fruits and vegetables and warn them from bad, unhealthy food such as fatty food or fast food in general.
- Physical activity
- Behavioral strategies: (*not discussed by the doctor*)
- Prevention

Slide18: Iron Deficiency

- One of the **most common** nutrient disorders of childhood
- Affects approximately 9% of toddlers
- Linked to lower test scores: test scores in school exams are badly affected due to iron deficiency.
- Dietary factors

Slide19: Dental Caries

The best and most appropriate dose of fluoride for our body is **1 ppm (parts per million)

- Composition of the diet and an individual's eating habits are significant factors in developing dental caries.
- Frequent use of sweetened drinks in bottles
- Fewer cariogenic snacks should be emphasized
- Protein foods such as cheese, nuts, and meat should be eaten with sticky foods
- Dental hygiene and fluoride

Slide20: Allergies

**There are two types of allergies:

a- **Allergy towards gluten**: causes **Celiac Disease**. Gluten is found in wheat, bread and oats. The allergy towards gluten causes the breakage of the villi that are found in the small intestines. This will lead to distention (the state of being swollen), bloating, gas accumulation and bloating.

Treatment: special diet free from the food that contains gluten, such as bread, wheat and oats.

b- **Lactose-intolerance:** developing an allergy towards the milk sugar, lactose. This sensitivity is due to the enzyme (lact*ase*) deficiency.

Treatment: Special diet free from milk or other products containing lactose.

- Food allergies usually manifest in infancy and childhood
- Allergic responses include respiratory or gastrointestinal symptoms, skin reactions, fatigue, or behavior changes

Slide21: Attention Deficit Hyperactivity Disorder

- Dietary factors have been suggested as causes of ADHD
- Various dietary treatments include Feingold diet, omission of sugar, allergy elimination diets, and megavitamin therapy
- Little evidence to support these interventions

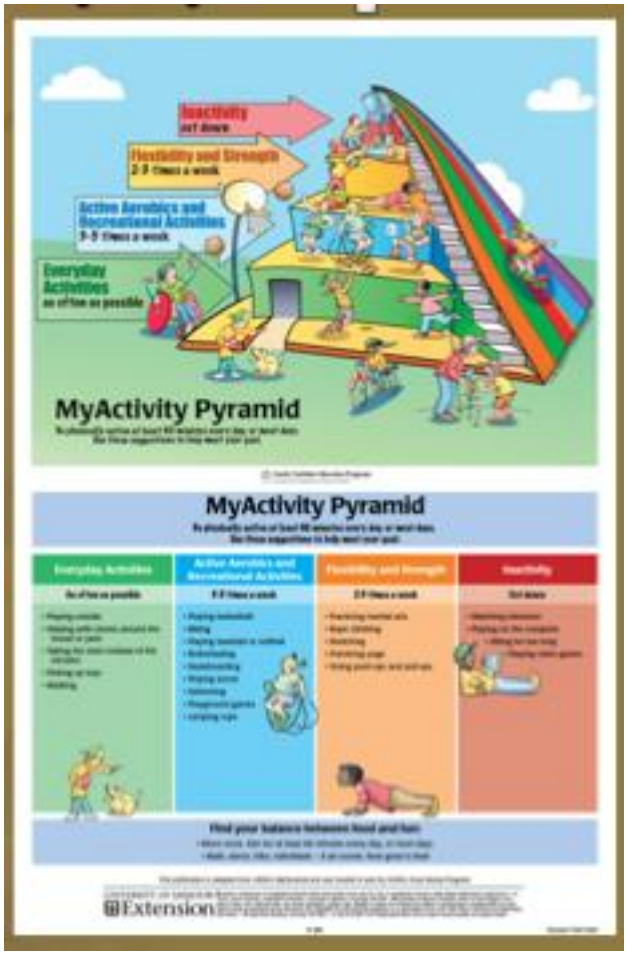
Slide22: Autism Spectrum Disorders

- Affect 1 in 166 children
- Affects children's nutrition and feeding, with very restricted food acceptance, hypersensitivities, and difficulty in making transitions: behavioral interventions may be helpful
- Little success with elimination diets, essential fatty acid supplements, megadoses of vitamins, other alternative therapies

Slide23: Preventing Chronic Disease

- Roots of chronic diseases in adults, such as heart disease, cancer, diabetes, and obesity are often based in childhood
- Dietary fat and cardiovascular disease
- Calcium and bone health and obesity
- Fiber
- Physical activity

Slide24: MyActivity Pyramid (not included)



Slide25: Focal Points

- Children's diets should provide enough energy to support optimal growth and development without causing excessive weight gain.
- For children's diets emphasis should be placed on fruits and vegetables, whole-grain products, low-fat dairy products, legumes, and lean meat, fish, and poultry.
- Fermentable carbohydrate intake should be controlled for good dental health.
- Adherence to general food guidelines is beneficial for children because their total fat intake decreases and their food fiber and micronutrient intake increases, resulting in a more nutrient-dense diet.

- Physical changes in the years between infancy and adolescence happen at a slower and steadier pace, and the cognitive, physical, and socioemotional growth is significant.
- Nutrition education and resources for families and children can help establish healthy, positive eating and activity patterns that carry through during adolescence and adulthood.