

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



# ملاحظات تغذیه در دوران نوجوانی

ارائه دهنده:

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# Adolescence

- Is one of the most exciting yet challenging periods in human development.
- The period of life that occurs between **12 and 21 years of age**,
- Adolescence is a period of tremendous **physiologic, psychological, and cognitive transformation** during which a child becomes a young adult

## **Peer influence and acceptance**

may become more important than family values, creating periods of  
conflict between teens and parents

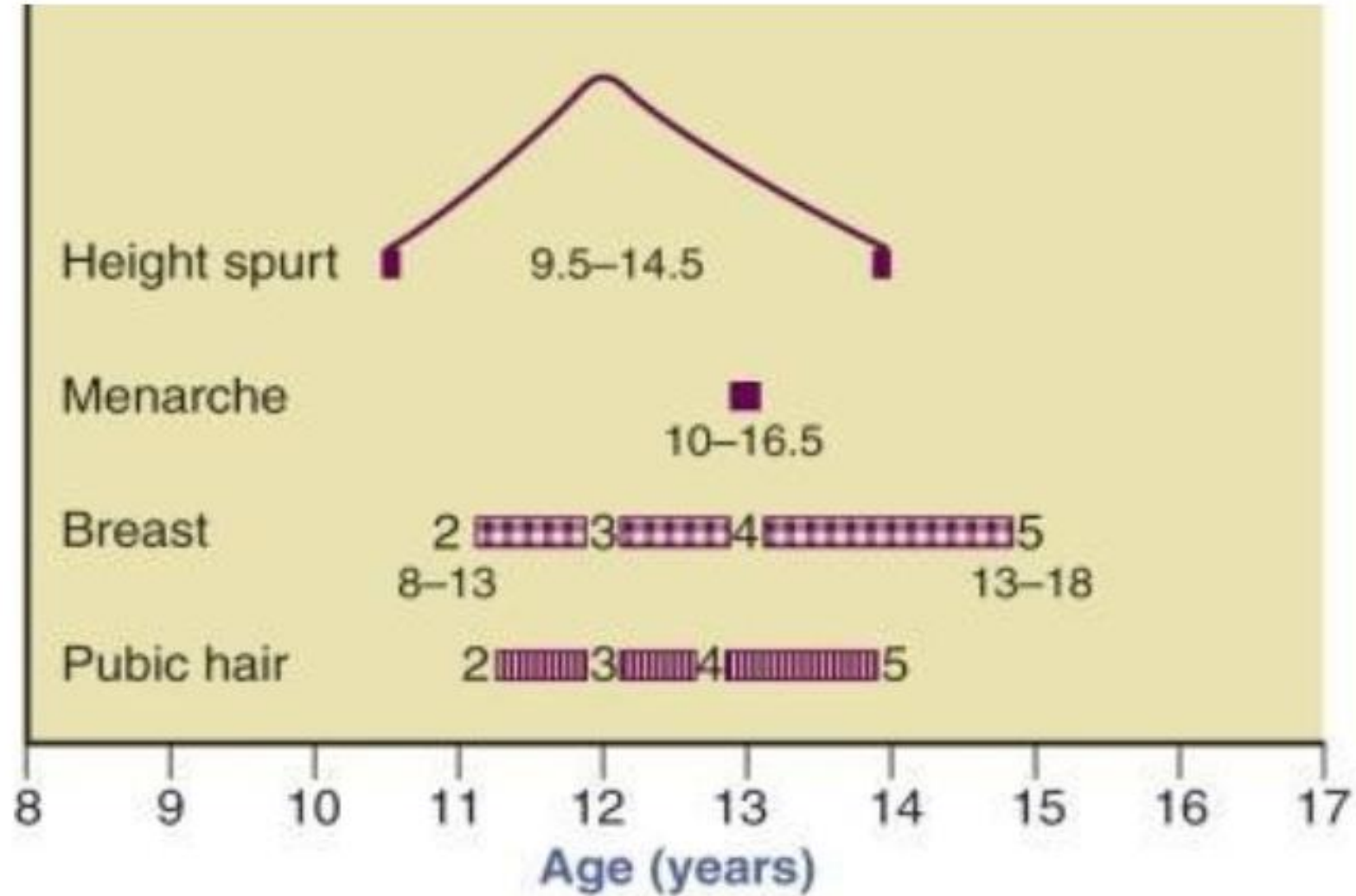
# Adolescence

## Puberty

- In general, adolescence is a time of impulsivity as a result of slow development in regions of the brain that govern cognitive control combined with a heightened **reward response**.
- Body size, body shape, and **body image**
- Diminishing trust and respect for adults
- Strong influence of peers and social media, especially around areas of body image

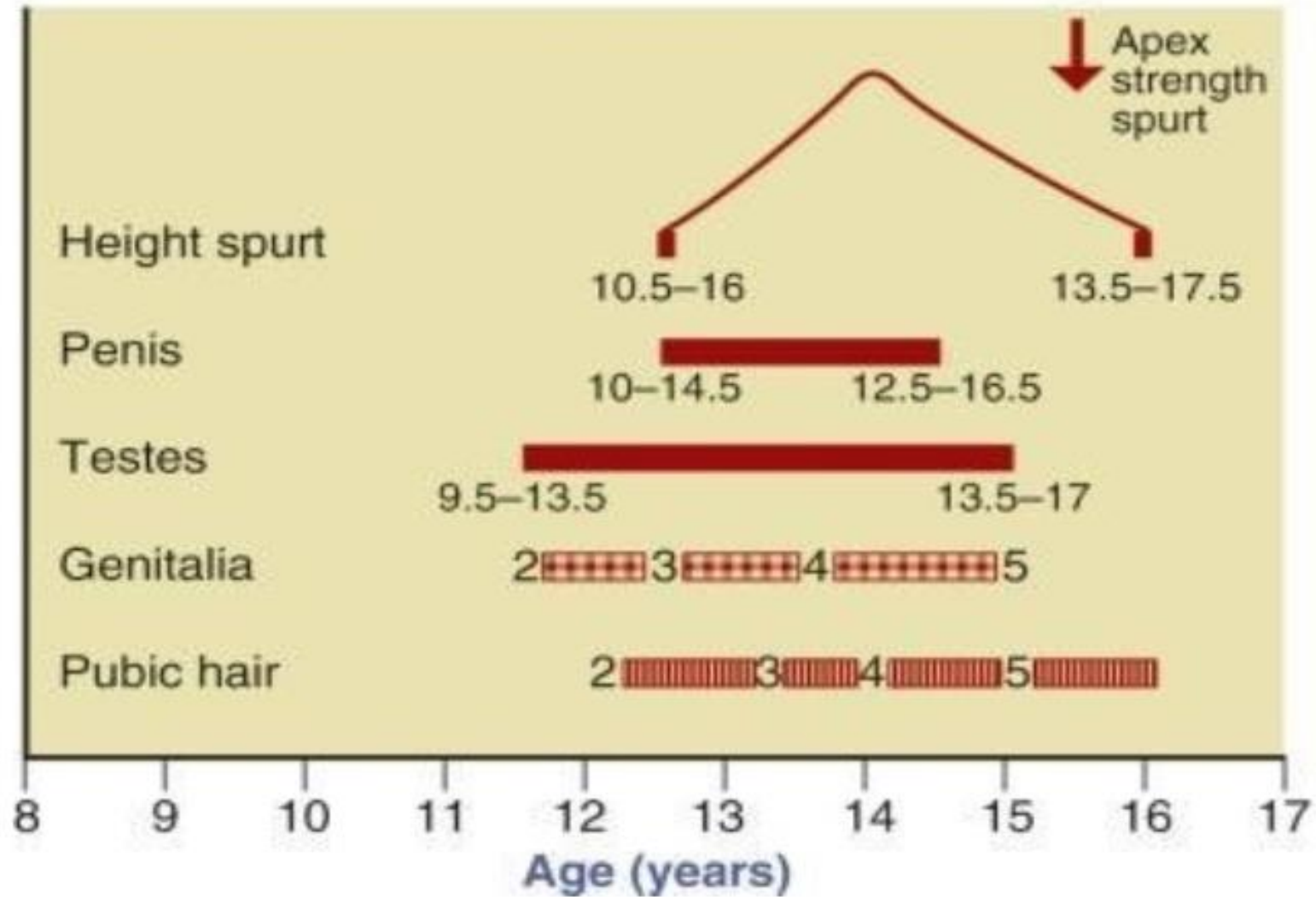
- ❖ Food choices are based on **taste, cost, convenience, and peer behaviors** than on health benefits
- ❖ Because these influences satisfy an adolescent's innate preference for **immediate reward**.
- ❖ **improving athletic or scholastic performance** and improving energy can be particularly effective in influencing health behavior change.
- ❖ Although many adolescents are concerned with their **Physical appearance**,
- ❖ It is important to address this topic with caution and sensitivity so as not to reinforce negative biases or increase a sense of shame.

# In females



Numbered 2 to 5 based on the Tanner developmental stages

# In males



Numbered 2 to 5 based on the Tanner developmental stages



Puberty typically begins earlier for females, between the ages of 8 and 12 years, and begins between 9 and 14 years for males

- Linear growth occurs throughout the **4 to 7 years of pubertal development** in most teens;
- The largest percentage of height is gained during an **18- to 24-month period** commonly referred to as the **growth spurt**. The fastest rate of growth during the growth spurt is labeled the **peak height gain velocity**.
- Females gain no more than **2 to 3 inches after menarche**, although females who have early menarche tend to grow more after its onset than do those having later

- Among **girls**, the “**growth spurt**” normally takes place between **12 and 18 months before the onset of menarche**, which occurs between the ages of 10 and 14.
- Then growth in stature continues for **up to 7 years**.
- **Growth of pelvic bones** continues for another **2-3 years** after height growth has stopped.

Teens gain **40% to 50% of adult body weight** during adolescence

**Body fat levels** increase from pre puberty averages of 15% for males and 19% for females,

to

- **15% to 18% in males**
- **22% to 26% in females.**

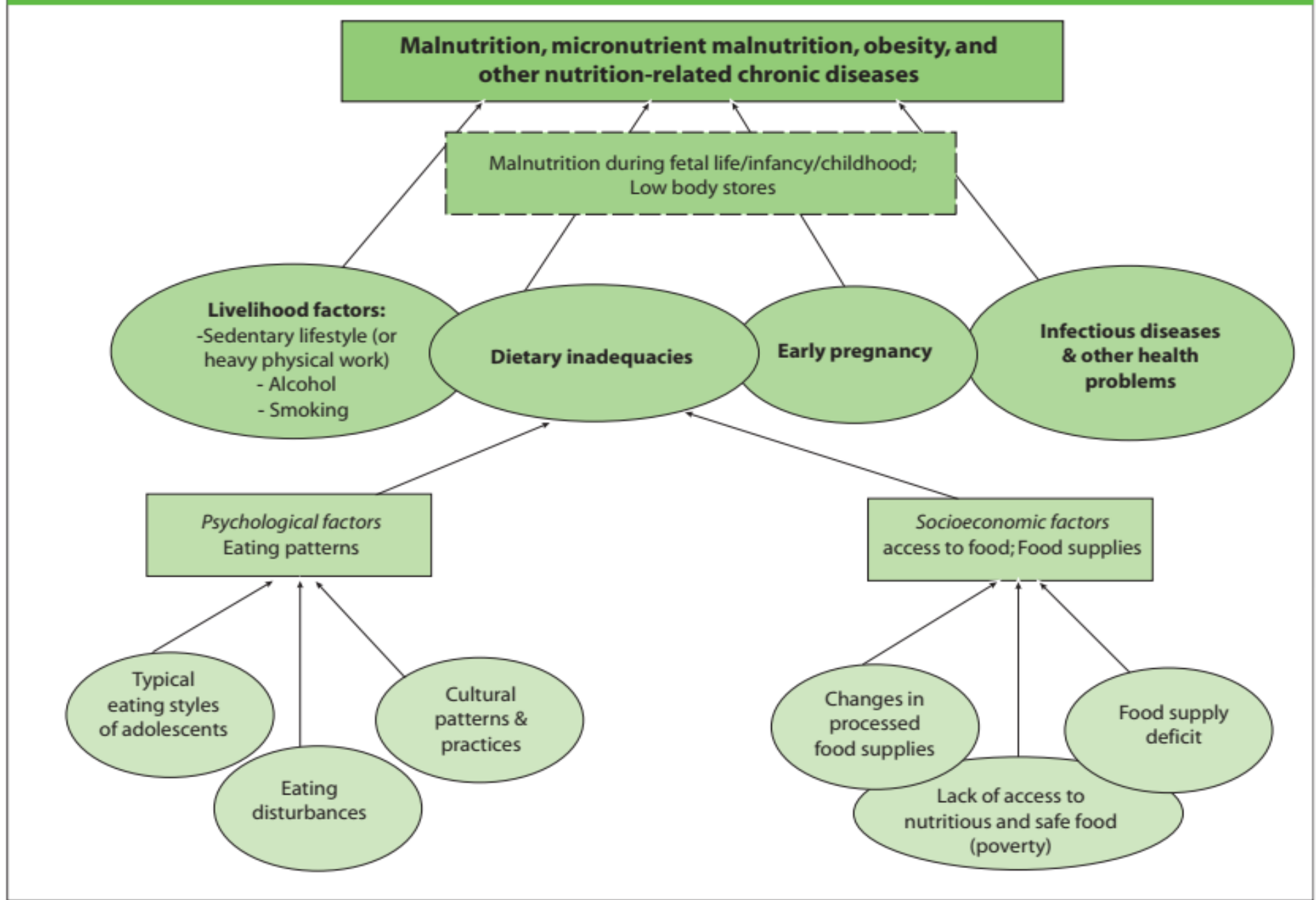
- ❖ **Growth retardation** is common in poorer countries, and it occurs primarily during the **first three years of life**.
- ❖ The **growth spurt** of adolescence has been seen as a period of potential interest for **catching up growth deficit of childhood**.

**Adolescents** are a **nutritionally vulnerable group** for a number

of specific reasons, including:

- High requirements for growth
- Eating patterns and lifestyles,
- Risk-taking behaviors
- Susceptibility to environmental influences.

Figure 1: A conceptual framework of nutritional problems and casual factors in adolescence



Main nutritional issues of adolescents in low- and middle-income countries:

- **Undernutrition and associated deficiencies**, often originating earlier in life
- **Iron deficiency anemia** and other micronutrient deficiencies;
- **Obesity** and associated cardiovascular disease risk markers;
- Early **pregnancy**
- **Inadequate or unhealthy** diets and lifestyles.

## Deviations from the normal patterns of growth

- ❖ Stimulant medications for the treatment of attention-deficit/hyperactivity disorder (**ADHD**) and **inhaled corticosteroids** for the treatment of asthma have been investigated due to concerns regarding appetite suppression and growth deficits
- ❖ Short-term studies of **stimulant treatment** have shown dose-dependent growth deficits of **1 to 1.4 cm/year** mainly in **the first 2 years of treatment**
- ❖ **Inhaled corticosteroids** are associated with mild growth suppression in the short term (**0.4 to 1.5 cm/year**) but **no clinically** significant effects on adult height



# نیازهای تغذیه ای:

## انرژی:

سن (سال)	کیلوکالری به ازای هر سانتی متر قد
۱-۳	۱۵
۴-۶	۱۶
۷-۱۰	۱۵
پسران	
۱۱-۱۴	۱۶
۱۵-۱۸	۱۷
دختران	
۱۱-۱۴	۱۴
۱۵-۱۸	۱۳/۵

## وزن او در حد ایده ال است اما کوتاه قد می باشد

در کودکان و نوجوانانی که کوتاه قد هستند انرژی مورد نیاز آنها را بر مبنای قد فعلی آنان محاسبه می کنیم. البته در مورد این کودکان و نوجوانان باید توجه کنیم که از گروه های غذایی مؤثر در رشد قدی آنها بویژه گروه شیر و گوشت مقدار کافی در رژیم غذایی قرار دهیم.

BMI این نوجوان ۱۴/۱ می باشد و مطابق با نمودار پرستایل ها، BMI برای سن او حدود صدک ۳ قرار دارد و این امر نشان دهنده آنست که این نوجوان لاغر می باشد، اما شاخص قد برای سن این نوجوان در محدوده صدک ۵+ قرار دارد و لذا قد این نوجوان در حد ایده ال است. چون می خواهیم BMI برای سن این نوجوان نیز در محدوده صدک ۵+ قرار بگیرد لذا لازم است رژیمی جهت افزایش وزن این نوجوان تنظیم نماییم. جهت این امر ابتدا انرژی مورد نیاز این نوجوان را بر مبنای قدش محاسبه می کنیم و سپس جهت افزایش وزن پیدا کردن این نوجوان به کالری مورد نیاز او حدود ۵۰۰-۳۰۰ کیلو کالری بر مبنای کمبود وزن و میزان اشتهای او اضافه می نماییم.

در کودکان و نوجوانانی که علاوه بر لاغر بودن کوتاه قد نیز هستند همانند کودکان و نوجوانانی که لاغر هستند اما قد آنها ایده ال می باشد عمل می کنیم. جهت این امر ابتدا انرژی مورد نیاز آنها را بر مبنای قدشان محاسبه می کنیم و سپس جهت افزایش وزن و قد آنها، به کالری مورد نیازشان حدود ۳۰۰-۵۰۰ کیلو کالری بر مبنای کمبود وزن و قد و همچنین میزان اشتهای آنها اضافه می نماییم. البته در مورد این کودکان و نوجوانان باید توجه کنیم که از گروه های غذایی مؤثر در رشد قدی آنها بویژه گروه شیر و گوشت مقدار کافی در رژیم غذایی قرار دهیم.

**\*\* در مورد کودکان و نوجوانان کوتاه قد می توانیم از مکمل روی به میزان RDA مورد نیاز برای سن آنها استفاده نماییم. همچنین کلسیم دریافتی آنها نیز باید در حد RDA باشد و در صورتیکه از طریق رژیم غذایی تأمین نمی شود باید مکمل کلسیم در حد مورد نیاز تجویز شود. همچنین تجویز شربت مولتی ویتامین می تواند مفید باشد. وضعیت ویتامین D این کودکان باید مورد بررسی قرار گیرد و در صورت کمبود ویتامین D، مکمل ویتامین D لازم است تجویز شود.**

## **EER for boys 3-8 years (within the 5th to 85th percentile for BMI)§**

EER = TEE Energy deposition

$EER = 88.5 - 61.9 \times \text{Age (yr)} + PA \times (26.7 \times \text{Weight [kg]} + 903 \times \text{Height [m]}) + 20$  (kcal for energy deposition)

## **EER for boys 9-18 years (within the 5th to 85th percentile for BMI)**

EER = TEE + Energy deposition

$EER = 88.5 - 61.9 \times \text{Age (yr)} + PA \times (26.7 \times \text{Weight [kg]} + 903 \times \text{Height [m]}) + 25$  (kcal for energy deposition)

in which

PA = Physical activity coefficient for boys 3-18 years:

PA = 1 if PAL is estimated to be  $\geq 1 < 1.4$  (Sedentary)

PA = 1.13 if PAL is estimated to be  $\geq 1.4 < 1.6$  (Low active)

PA = 1.26 if PAL is estimated to be  $\geq 1.6 < 1.9$  (Active)

PA = 1.42 if PAL is estimated to be  $\geq 1.9 < 2.5$  (Very active)

## **EER for girls 3-8 years (within the 5th to 85th percentile for BMI)**

EER = TEE + Energy deposition

$EER = 135.3 - 30.8 \times \text{Age (yr)} + PA \times (10 \times \text{Weight [kg]} + 934 \times \text{Height [m]}) + 20$  (kcal for energy deposition)

## **EER for girls 9-18 years (within the 5th to 85th percentile for BMI)**

EER = TEE + Energy deposition

$EER = 135.3 - 30.8 \times \text{Age (yr)} + PA \times (10 \times \text{Weight [kg]} + 934 \times \text{Height [m]}) + 25$  (kcal for energy deposition)

in which

PA = Physical activity coefficient for girls 3-18 years:

PA = 1 (Sedentary)

PA = 1.16 (Low active)

PA = 1.31 (Active)

PA = 1.56 (Very active)

## Weight maintenance TEE for overweight and at-risk for overweight boys 3-18 years (BMI >85th percentile for overweight)

$$\text{TEE} = 114 - 50.9 \times \text{Age (yr)} + \text{PA} \times (19.5 \times \text{Weight [kg]} + 1161.4 \times \text{Height [m]})$$

in which

PA = Physical activity coefficient:

PA = 1 if PAL is estimated to be  $\geq 1.0 < 1.4$  (Sedentary)

PA = 1.12 if PAL is estimated to be  $\geq 1.4 < 1.6$  (Low active)

PA = 1.24 if PAL is estimated to be  $\geq 1.6 < 1.9$  (Active)

PA = 1.45 if PAL is estimated to be  $\geq 1.9 < 2.5$  (Very active)



## Weight maintenance TEE for overweight and at-risk for overweight girls 3-18 years (BMI >85th percentile for overweight)

$$\text{TEE} = 389 - 41.2 \times \text{Age (yr)} + \text{PA} \times (15 \times \text{Weight [kg]} + 701.6 \times \text{Height [m]})$$

in which

PA = Physical activity coefficient:

PA = 1 if PAL is estimated to be  $\geq 1 < 1.4$  (Sedentary)

PA = 1.18 if PAL is estimated to be  $\geq 1.4 < 1.6$  (Low active)

PA = 1.35 if PAL is estimated to be  $\geq 1.6 < 1.9$  (Active)

PA = 1.60 if PAL is estimated to be  $\geq 1.9 < 2.5$  (Very active)

## پروتین

- ۱۷٪ تا ۱۸٪ انرژی محاسبه شده

### Protein: Estimated Average Requirements and Recommended Dietary Allowances for Adolescents

Age (yr)	EAR (g/kg/day)	RDA (g/kg/day)
9-13	0.76	0.95 or 34 g/day*
14-18 Males	0.73	0.85 or 52 g/day*
14-18 Females	0.71	0.85 or 46 g/day*

EAR, Estimated average requirement; RDA, recommended dietary allowance.

Data from Institute of Medicine, Food and Nutrition Board: *Dietary reference intakes for energy, carbohydrate, fiber, fat, fatty acids, cholesterol, protein, and amino acids*, Washington, DC, 2002, National Academies Press.

\*Based on average weight for age.

- ۳۰٪ انرژی محاسبه شده
- کمتر از ۱۰٪ از SFA

- **The AI for omega-6 PUFA:**

- 12 g/day for 9- to 13-year-old males
- 10 g/day for 9- to 13-year-old females
- 16 g/day for 14- to 18-year-old males
- 11 g/day for 14- to 18-year-old females

- **Estimated requirements for omega-3 PUFA:**

- 1.2 g/day for 9- to 13-year-old males
- 1 g/day for 9- to 13-year-old females
- 1.6 g/day for 14- to 18-year-old males
- 1.1 g/day for 14- to 18-year-old females

## کربوهیدرات

- ۵۳٪ تا ۵۴٪ انرژی محاسبه شده

## فیبر

14 g/1000 kcal

- راهنماهای غذایی برای کودکان سنین مدرسه، نوجوانان و بزرگسالان

از ۱۸ سالگی به بعد	حداقل واحد توصیه شده در روز	از ۱۳ تا ۱۸ سالگی	حداقل واحد توصیه شده در روز	از ۷ تا قبل از ۱۳ سالگی	حداقل واحد توصیه شده در روز	گروه های غذایی
۱ ل ۴۵ گرم ۱ ل	۲-۳	۱ ل ۴۵ گرم ۱ ل	۳	۱ ل ۶۰ گرم ۱ ل	۳	گروه شیر شیر پنیر ماست
۶۰-۹۰ گرم	۲-۳	۶۰-۹۰ گرم	۲-۳	۶۰ گرم	۲	گروه گوشت ها گوشت، مرغ، ماهی

لازم به ذکر است که هر ۱ عدد تخم مرغ یا  $\frac{1}{2}$  لیوان حبوبات پخته یا  $\frac{1}{3}$  لیوان مغزها معادل با ۳۰ گرم گوشت می باشد.

**- راهنماهای غذایی برای کودکان سنین مدرسه، نوجوانان و بزرگسالان**

از ۱۸ سالگی به بعد	حداقل واحد توصیه شده در روز	از ۱۳ تا ۱۸ سالگی	حداقل واحد توصیه شده در روز	از ۷ تا قبل از ۱۳ سالگی	حداقل واحد توصیه شده در روز	گروه های غذایی
۱/۲ ل ۱ ل ۳/۴ ل	۳-۵	۱/۲ ل ۱ ل ۳/۴ ل	۳-۵	۱/۲ ل ۱ ل ۳/۴ ل	۳	<b>گروه سبزی</b> انواع سبزی (خام یا پخته)  سبزی های برگی  آب سبزی ها
۱ عدد ۱/۲ ل ۳/۴ ل ۱/۴ ل	۲-۴	۱ عدد ۱/۲ ل ۳/۴ ل ۱/۴ ل	۲-۴	۱ عدد ۱/۲ ل ۱/۲ ل ۱/۴ ل	۲	<b>گروه میوه</b> انواع میوه  انواع میوه های پخته  انواع آبمیوه  میوه های خشک
یک برش نان ۳۰ گرمی ۲/۴ ل غلات پخته	۶-۱۱	یک برش نان ۳۰ گرمی ۲/۴ ل غلات پخته	۶-۱۱	یک برش نان ۳۰ گرمی ۲/۴ ل غلات پخته	۶	<b>گروه نان و غلات</b> انواع نان ها  انواع غلات پخته

# Calcium

- **Females** accrue approximately **37%** of their total skeletal mass from **ages 11 to 15** years, making adolescence a crucial time for osteoporosis prevention.
- RDA :1300 mg
- Upper level intake : 3000 mg/day
- Examples of nondairy calcium sources include calcium fortified orange juice, soy milk, rice milk, and almond milk; calcium-fortified ready-to-eat cereals; enriched breads and other grains; some legumes (e.g., white beans) and dark green vegetables (e.g., kale, broccoli); and tofu prepared with calcium sulfate

# Iron

Iron requirements: to support the deposition of **lean body mass**, increase in **red blood cell volume**, and need to replace iron lost during **menses** among females.

The DRI in females increases from 8 mg/day before age 13 (or before the onset of menses) to 15 mg/day after the onset of menses.

Among **adolescent males** recommended intakes increase from **8 to 11 mg/day**, with higher levels required during the growth spurt.

Rapid growth may temporarily decrease circulating iron levels, resulting in **physiologic anemia of growth**.



- Iron deficiency is related to vitamin A status.
- A direct interaction between vitamin A status and the utilization of dietary and stored iron for hemoglobin formation

- ❑ Thus, marginal vitamin A status may compromise iron metabolism.
- ❑ Menstrual irregularities may be more frequent in women with low vitamin A stores or serum retinol

Retinol <0.7 mmol/L

- The relationship of serum retinol binding protein and retinol with puberty level suggests an important role of vitamin A in sexual maturation

# Risk Factors for Iron Deficiency

## Inadequate iron intake/absorption/stores

- Food insecurity or living in poverty
- Malabsorption diseases (e.g., celiac disease)
- Unbalanced vegetarian eating styles, especially vegan diets
- Restrictive diets that eliminate entire food groups
- Low intakes of meat, fish, poultry, or iron-fortified foods
- Low intake of foods rich in ascorbic acid
- Frequent dieting or restricted eating
- Chronic or significant weight loss
- Meal skipping
- Substance abuse
- History of iron-deficiency anemia
- Recent immigration from developing country
- Special health care needs

# Risk Factors for Iron Deficiency

## Increased iron requirements and losses

- Heavy or lengthy menstrual periods
- Rapid growth
- Pregnancy (recent or current)
- Inflammatory bowel disease
- Chronic use of aspirin, nonsteroidal anti-inflammatory drugs (e.g., ibuprofen),
- Corticosteroids
- Participation in endurance sports (e.g., long-distance running, swimming, cycling)
- Intensive physical training
- Frequent blood donations
- Parasitic infection

## **Vitamin D**

**RDA for vitamin D requirements = 600 IU/day (15 µg/day)**

## Vegetarian dietary patterns

- ❖ Vitamin B12 and may be deficient in calcium, vitamin D, zinc, iron, and long-chain omega-3 fatty acids
- ❖ A daily multivitamin-mineral supplement is essential for vegans.
- ❖ Instructing adolescents and their caregivers on the planning of a well-balanced vegetarian diet and use of fortified foods can prevent potential nutrient deficiencies.

# Skin health

Guiding individuals with acne toward a

- **Healthful, low-glycemic load diet , low in saturated fat and high in whole grains, fruit, and vegetables.**
- Omega-3
- As long as intake of **calcium and vitamin D** are sufficient, it may further be beneficial to recommend a diet lower in dairy but as yet the quantity of milk necessary to exacerbate acne has not been established.

## **Weight status assessment**

Adolescent weight status is typically evaluated based on BMI

(weight/height<sup>2</sup> [kg/m<sup>2</sup>])



- An overweight BMI are more likely to have metabolic abnormalities such as elevated blood glucose, triglycerides, cholesterol, and liver enzymes.
- **Laboratory testing and additional screening** are therefore recommended for adolescents at a high BMI to assess for the presence of chronic disease risk factors and presence of diabetes and liver disease

نوع رژیم تجویز شده	پرستایل BMI برای سن	سن (سال)
رژیم غذایی حفظ وزن (Weight Maintenance)	صدک ۸۵ تا کمتر از صدک ۹۵	۲-۵
رژیم غذایی حفظ وزن (در صورتیکه BMI بیشتر از ۲۱ باشد) رژیم کاهش وزن تا ۰/۵ کیلوگرم در ماه قابل قبول می باشد)	صدک ۹۵ یا بالاتر	
رژیم غذایی حفظ وزن	صدک ۸۵ تا کمتر از صدک ۹۵	۶-۱۱
رژیم غذایی کاهش وزن به میزان ۰/۵ کیلوگرم در ماه	صدک ۹۵ تا کمتر از صدک ۹۹	
رژیم غذایی کاهش وزن به میزان حداکثر ۱ کیلوگرم در هفته	بالاتر از صدک ۹۹	
رژیم غذایی حفظ وزن	صدک ۸۵ تا کمتر از صدک ۹۵	۱۲-۱۸
رژیم غذایی کاهش وزن به میزان حداکثر ۱ کیلوگرم در هفته	صدک ۹۵ تا کمتر از صدک ۹۹	
رژیم غذایی کاهش وزن به میزان حداکثر ۱ کیلوگرم در هفته	بالاتر از صدک ۹۹	

# **Guidelines for adolescent overweight and obesity**

**A staged care, multicomponent treatment process**

## A staged care, multicomponent treatment process

### Stage 1

---

Appropriate for adolescents at an **overweight BMI** with no comorbid conditions and/or sexual maturity rating (**SMR**) of 4 or less.

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Weight loss should be **monitored monthly** by the provider and not exceed **1 to 2 pounds per week**.

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Achieve 1 hour of moderate-to-vigorous physical activity each day.  
Limit daily screen time to no more than 2 hours.

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**General nutrition and physical activity advice**

## **Guidelines for stage 1**

- Remove television and other forms of screen media from the bedroom.
- Consume five fruit and vegetable servings per day, but limit intake of juice.
- Limit eating occasions away from home with the exception of school meals.
- Participate in family meals on most days of the week.
- Consume at least three meals per day rather than frequently snacking.
- Eat mindfully, only when hungry, and only until satiated.
- Reduce consumption of most energy-dense foods and beverages and eliminate consumption of sugar-sweetened beverages.
- Select appropriate portion sizes when eating at home and away from home.

## Ratings of Sexual Maturation\*

	Pubic Hair	Genitalia	Corresponding Changes
<b>Males</b>			
Stage 1	None	Prepubertal	
Stage 2	Small amount at outer edges of pubis, slight darkening	Beginning penile enlargement Testes enlarged to 5-mL volume Scrotum reddened and changed in texture	Increased sweat gland activity
Stage 3	Covers pubis	Penis longer Testes enlarged to 8-10 mL Scrotum enlarged	Voice changes Faint mustache and facial hair Axillary hair Beginning of peak height gain velocity (growth spurt of 6-8 inches)
Stage 4	Adult type, does not extend to thighs	Penis wider and longer Testes enlarged to 12 mL Scrotal skin darker	End of peak height gain velocity More facial hair Darker hair on legs Voice deeper Possibly severe acne
Stage 5	Adult type, spreads to thighs	Adult penis Testes enlarged to 15 mL	Significantly increased muscle mass

<b>Females</b>			
Stage 1	None	No change from childhood	
Stage 2	Small amount, downy, on medial labia	Breast buds	Increased sweat gland activity Beginning of peak height gain velocity (growth spurt of 3-5 inches)
Stage 3	Increased, darker, curly	Larger, but no separation of the nipple and the areola	End of peak height gain velocity Beginning of acne Axillary hair
Stage 4	More abundant, coarse texture	Larger Areola and nipple form secondary mound	Possibly severe acne Menarche begins
Stage 5	Adult, spreads to medial thighs	Adult distribution of breast tissue, continuous outline	Increased fat and muscle mass

## Stage 2

- Appropriate for adolescents at an overweight BMI with no comorbid conditions and/or sexual maturity rating (SMR) of 4 or less.
- More structure.
- Training in motivational counseling.
- Considered successful if  
weight maintenance or  
weight loss of up to 2 pounds per week is achieved.
- Assessment of progress should be monitored monthly.



## Guidelines for stage 2

- Monitor food and beverage intake through daily food and exercise journals or record books.
- Set goals for food and physical activity behavior changes and monitor progress toward goals.
- Limit time spent with **screen media to no more than 60 minutes per day.**
  - Follow **a structured meal plan with scheduled meal and snack times.**
- Plan and monitor physical activity to ensure 60 minutes of moderate-to-vigorous activity each day.
- Reinforce successful lifestyle changes through the use of age-appropriate, nonfood rewards such as tickets to a local event or museum, jewelry, clothing, or music.

## Stage 3

- Is more structured than stage 2.
- BMI at or **above the 99th percentile** for age and gender may start treatment in stage 3.
- a **multidisciplinary team** that includes a physician or pediatric nurse practitioner, a counselor (psychologist or social worker), a registered dietitian nutritionist, and an exercise physiologist or physical therapist.
- Stage 3 treatment is considered **successful**

when BMI no longer exceeds the 85th percentile for age and gender

- **Weight loss** should be monitored to **not exceed 2 pounds per week.**
- If no improvement is seen **after 3 to 6 months**, or if comorbid conditions worsen, it is recommended that treatment advance to stage 4.

## **Guidelines for stage 3**

- The treatment program provides at least 50 hours and ideally more than 70 hours of intervention within 2 to 6 months.
- A family component and an adolescent-only component are offered.
- A highly structured meal plan is developed and monitored.
- A highly structured physical activity plan is developed and monitored.
- A formal behavior modification program is instituted by a counselor, with parental involvement as appropriate.

## Stage 4

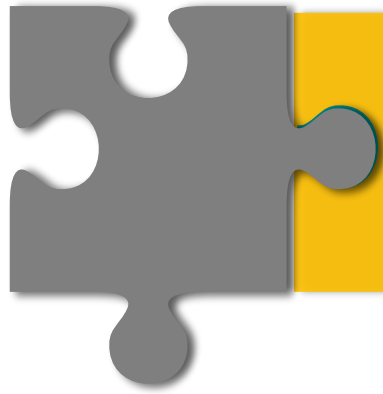
- ❖ A tertiary care service and is reserved for severely obese adolescents or those who have a BMI at or above the 95th percentile for age and gender
- ❖ Who have significant comorbidities that require concerted intervention.
- ❖ This treatment stage is available only in clinical settings that employ a full range of health professionals who are trained specifically in the behavioral and medical management of pediatric obesity.

## Guidelines for stage 4

- Intensive dietary regimens, such as meal replacement, protein-sparing modified fasts, and oral medication.
- Bariatric surgery may be used.

Adapted from Spear B et al: Recommendations for treatment of child and adolescent overweight and obesity, *Pediatrics* 120:S254, 2007 and U.S. Preventative Services Task Force; Barton M: Screening for Obesity in Children and Adolescents: U.S. Preventive Services Task Force Recommendation Statement, *Pediatrics* 125:361, 2010.

Advancing to the next stage of treatment may be recommended if insufficient progress is made to improve weight status or resolve comorbid conditions after 3 to 6 months.



# Am I a candidate? In 10 - 19 years age group

**ASMBS pediatric metabolic and bariatric surgery guidelines, 2018**

- \* BMI  $\geq$ 140% of the 95th percentile**
- \* BMI  $\geq$ 120% of the 95th percentile with hyperlipidemia, HTN, T2D, insulin resistance, depressed HRQoL, GERD, OSA, NAFLD, orthopedic disease, IIH**

## BMI 99th Percentile Cut-Points (kg/m<sup>2</sup>)

Age, y	Boys	Girls
5	20.1	21.5
6	21.6	23.0
7	23.6	24.6
8	25.6	26.4
9	27.6	28.2
10	29.3	29.9
11	30.7	31.5
12	31.8	33.1
13	32.6	34.6
14	33.2	36.0
15	33.6	37.5
16	33.9	39.1
17	34.4	40.8

**American Academy of Pediatrics. Pediatric Obesity Clinical Decision Support Chart. Elk Grove Village, IL: American Academy of Pediatrics; 2008.**



# Indications and contraindications for adolescent metabolic and bariatric surgery (MBS)

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## Indications for adolescent MBS include

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- BMI  $\geq 35$  kg/m<sup>2</sup> or 120% of the 95th percentile with clinically significant co-morbid conditions such as obstructive sleep apnea (AHI >5), T2D, IIH, NASH, Blount's disease, SCFE, GERD, or hypertension; or BMI  $\geq 40$  kg/m<sup>2</sup> or 140% of the 95th percentile (whichever is lower).
- A multidisciplinary team must also consider whether the patient and family have the ability and motivation to adhere to recommended treatments pre- and postoperatively, including consistent use of micronutrient supplements.

## Contraindications for adolescent MBS include

- A medically correctable cause of obesity
- An ongoing substance abuse problem (within the preceding yr)
- A medical, psychiatric, psychosocial, or cognitive condition that prevents adherence to postoperative dietary and medication regimens.
- Current or planned pregnancy within 12 to 18 mo of the procedure

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BMI = body mass index; AHI = apnea-hypopnea index; T2D = type 2 diabetes; IIH = idiopathic intracranial hypertension; NASH = nonalcoholic steatohepatitis; SCFE = slipped capital femoral epiphysis; GERD = gastroesophageal reflux disease.



## **Blood lipids**

**Refer** adolescent with

- family history of premature heart disease
- family history of dyslipidemia
- overweight/obese

to primary care provider and **request a blood lipid panel.**

## Classification Criteria for the Diagnosis of Hyperlipidemia in Adolescents (10- to 19-years-old)\*

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	<b>Acceptable</b>	<b>Borderline</b>	<b>Unacceptable</b>
Total cholesterol (mg/dL)	≤170	170-199	≥200
LDL cholesterol (mg/dL)	<110	110-129	≥130
Non-HDL cholesterol (mg/dL)	<120	120-144	>145
HDL cholesterol (mg/dL)	>45	40-45	<40
Triglycerides (mg/dL)	<90	90-129	>130
Apolipoprotein A-1 (mg/dL)	>120	115-120	<115
Apolipoprotein B (mg/dL)	<90	90-109	>110

*HDL*, High-density lipoprotein; *LDL*, low-density lipoprotein.

# Blood lipids

- Review blood lipid levels with adolescent and parent(s).
- Provide nutrition counseling as appropriate.
- If **overweight**, provide dietary counseling in accordance with step 1.
- If **obese**, provide dietary counseling in accordance with step 2 and refer to comprehensive weight management program.
- The addition of **plant sterols or stanols** at **no more than 2 g/day** can be recommended for teens with familial hyperlipidemia.
- If dietary management is not effective, refer to primary care provider for physical examination and management of dyslipidemia by medication as needed



Color Derived from Natural Source - No Synthetic Dyes  
No Artificial Flavors • No Preservatives  
No Yeast or Starch • Gluten Free

**SUGGESTED USE:** Take two caplets two times daily with meals. For easier swallowing, take with water before and during ingestion.

**CAUTION:** Not for use by children or pregnant or lactating women. Check with your physician before using CholestOff® Original if you are currently using medications to lower your cholesterol.

Keep bottle tightly closed. Store in a cool, dry place out of reach of children.

**Do not use if imprinted seal under cap is broken or missing.**

#### Supplement Facts

Serving Size 2 Caplets

Servings Per Container 30

Amount Per Serving	% Daily Value
Calcium 260 mg	26%
Sodium 15 mg	Less than 1%
Plant sterols/stanols 900 mg	*

\*Daily Value not established.

**INGREDIENTS:** Plant Sterols/Stanoles (Pine Tree), Calcium Carbonate, Tribasic Calcium Phosphate, Croscarmellose Sodium, Hydroxypropyl Methylcellulose, Silicon Dioxide, Magnesium Stearate, Color Added, Polyethylene Glycol, Triethyl Citrate, Polysorbate 80.

Distributed by: **Nature Made Nutritional Products**  
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Cholestoff® Caplets are made to Nature Made's guaranteed purity and potency standards.



## ترکیبات ( به ازای 2 کپسول )

عنوان	مقدار
Calcium	260 mg
Sodium	15 mg
Plant Sterols /Stanols	900 mg

★ نیاز مصرف روزانه از طرف شرکت سازنده مشخص نشده است  
★ ★ مقدار به کار رفته از طرف شرکت سازنده مشخص نشده است

## Dietary recommendations for elevated LDL-C

- Limit total fat intake to no more than 25% to 30% of calories.
- Limit **saturated fat** intake to no more than **7%** of calories.
- Dietary cholesterol intake should not exceed 200 mg/day.
- Plant sterol esters and/or stanol esters can replace usual fat intake up to 2 g/day for children with familial hypercholesterolemia.
- Up to 12 g of psyllium fiber can be added to the diet each day as cereal enriched with psyllium.
- At least 1 hour of moderate to vigorous exercise should be obtained daily.
- Sedentary and/or screen time should be limited to less than 2 hours each day.



## Dietary Recommendations for Adolescents with Elevated Triglyceride or Non-High-Density Lipoprotein Cholesterol Levels

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- Limit total fat intake to no more than 25% to 30% of calories.
- Limit saturated fat intake to no more than 7% of calories.
- Reduce intake of added and natural sugars in the diet.
- Replace simple carbohydrates with complex carbohydrate and whole grains.
- Avoid sugar-sweetened beverages.
- Increase the intake of fish high in omega-3 fatty acids.

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Adapted from U.S. Department of Health and Human Services, National Institutes of Health, National Heart, Lung and Blood Institute: *Expert panel on integrated guidelines for cardiovascular health and risk reduction in children and adolescents. Summary report*, NIH Publication No 12-7486A, October 2012.

## **Blood pressure**

- Provide counseling in accordance with the DASH diet.
- Request follow-up visit
- If adolescent is overweight, provide dietary counseling in accordance with step 1.
- If adolescent is obese, provide dietary counseling in accordance with step 2 and refer to comprehensive weight management program.

# Diabetes

Refer adolescent with

- Family history of diabetes,
- Signs of acanthosis nigricans,
- Symptoms consistent with diabetes
- Overweight/obese

to a [primary care provider](#) and request a fasting blood glucose.

# Diabetes

- Review fasting blood glucose levels with adolescent and parent(s).
- Provide nutrition counseling as appropriate.
- If adolescent is overweight, provide dietary counseling in accordance with step 1.
- If adolescent is obese, provide dietary counseling in accordance with step 2 and refer to comprehensive weight management program.

## Recommendations for Screening Adolescents for Type 2 Diabetes Mellitus

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Youth who are at an overweight or obese body mass index and exhibit two of the following risk factors are at high risk:

- First- or second-degree relative with a history of type 2 diabetes
- Member of a racial/ethnic group considered at higher risk (American Indian, African American, Latino, Asian American/Pacific Islander)
- Dyslipidemia
- Hypertension
- Acanthosis nigricans
- Polycystic ovary syndrome

Screening should begin at age 10 or the onset of puberty, whichever occurs first.

Screening should occur every 2 years.

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Adapted from U.S. Department of Health and Human Services, National Institutes of Health, National Heart, Lung and Blood Institute: *Expert panel on integrated guidelines for cardiovascular health and risk reduction in children and adolescents. Summary report*, NIH Publication No 12-7486A, October 2012.

## بیماران دریافت کننده انسولین

صبحانه	میان وعده صبح	ناهار	میان وعده عصر	شام	وعده آخر شب
%۱۵	%۱۳	%۲۲	%۱۳	%۲۲	%۱۵
۶۳٪ کربوهیدرات تقریباً معادل دو سوم			۳۷٪ تقریباً معادل یک سوم		

## بیماران دریافت کننده قرص های پایین آورنده گلوکز خون،

صبحانه	میان وعده صبح	ناهار	میان وعده عصر	شام	وعده آخر شب
%۱۵	%۱۳	%۲۴	%۱۳	%۲۴	%۱۱

## **Physical activity**

- Reinforce need for 60 min or more of moderate-to-vigorous physical activity per day.
- Reinforce limiting sedentary and screen time to no more than 2 hours per day.

## Cardiovascular Health Integrated Lifestyle Diet (CHILD 1) Recommendations, Ages 11 to 21 Years

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Primarily select fat-free unflavored milk, water, and unsweetened tea as beverage choices.
Limit or avoid sugar-sweetened beverages.
Try to consume a range of 25% to 30% of daily energy needs from total fatty acids.
Limit saturated fatty acids to 8% to 10% of daily energy needs.
Keep monounsaturated and polyunsaturated fatty acids to no more than 20% of daily energy intake.
Avoid trans fatty acids.
Limit dietary cholesterol to 300 mg/day.
Choose foods high in dietary fiber often to include a goal of 14 g fiber per 1000 kcal.
Choose naturally sweetened juices (no added sugar) and limit intake to 4 to 6 oz/day.
Limit sodium intake.
Try to eat breakfast daily.
Try to eat meals together with other family members at the same table.
Limit fast food meals.
Use the Dietary Approaches to Stop Hypertension eating plan as a guide to plan meals.
Aim to keep average energy intake close to estimated energy requirements with adjustment for growth and physical activity as needed.





**THANK YOU**

FOR YOUR KIND ATTENTION