بسم الله الرحمن الرحيم

دانشگاه علوم پزشکی و خدمات بهداشتی درمانی شهید بهشتی

تغذیه درمانی در مدیریت دیابت در کودکان و نوجوانان

سمیه حسین پور نیازی

مرکزتحقیقات تغذیه و غدد درون ریز، پژوهشکده علوم غدد درون ریز و متابولیسم

دانشگاه علوم پزشکی شهید بهشتی

زمستان ۱۴۰۲

Classification and diagnoses of diabetes

- Children and adolescents with diabetes
  - Type 1 Diabetes in Children and Adolescents
    - *Monogenic diabetes (neonatal diabetes and maturity onset diabetes in the young [MODY])*
    - *Cystic fibrosis–related diabetes (present in youth)*
  - Type 2 Diabetes in Adolescents and Youth (TODAY)

- Criteria for the diagnosis of *Type 2 diabetes*
- Categories of increased risk for diabetes (*prediabetes*)
- Testing for type 2 diabetes or prediabetes in *asymptomatic children*
- Criteria for testing for diabetes or prediabetes in *asymptomatic adults*
- Screening for and diagnosis of GDM
- *Specific types of diabetes* due to other cause

ADA. Diabetes care; 2022; 46 (s1): S19- 40

Type 1 diabetes

- Can develop at any age
  - About two-thirds of new cases under the age of 18

- Two peak times for development of type 1 diabetes:
  - Early childhood (birth to eight years old)
  - At puberty

ADA. Diabetes care; 2022; 46 (s1): S19- 40

Classification and diagnoses of diabetes *(cont'd)*

Type 1 diabetes

Staging of type 1 diabetes

Stage	Stage 1	Stage 2	stage 3
	• Autoimmunity • Normoglycemia • presymptomatic	• Autoimmunity • Dysglycemia • presymptomatic	• New onset hyperglycemia • symptomatic
Diagnostic criteria	• Multiple autoantibodies • No IGT or IFG	• Multiple autoantibodies • Dysglycemia: IFG and/or IGT • FPG 100-125 mg/dl • 2-h PG 140-199 mg/dl • A1C 5.7-6.4% or ≥ 10% increase in A1C	• Clinical symptoms • Diabetes by standard criteria

ADA. Diabetes care; 2022; 46 (s1): S19- 40

Classification and diagnoses of diabetes *(cont'd)*

Type 1 diabetes

Standard criteria for the diagnosis of diabetes

- **FPG ≥ 126** mg/dL (7.0 mmol/L). Fasting is defined as no caloric intake for at least 8 h.
- **2-h PG ≥ 200** mg/dL (11.1 mmol/L) during an OGTT. The test should be performed as described by the WHO, using a glucose load containing the equivalent of 75 g anhydrous glucose dissolved in water
- In a patient with classic symptoms of hyperglycemia or hyperglycemic crisis, a random plasma glucose **≥ 200** mg/dL (11.1 mmol/L)

ADA. Diabetes care; 2019; 40 (s1): S11- 24

Plasma blood glucose and A1C goals for

Values by age	Plasma blood glucose goal range (mg/dl)		A1C	Rationale
	Before meals	Bedtime/overnight		
Toddlers and preschoolers (<6 years)	100–180	110–200	<8.5 (but >7.5) %	• High risk and vulnerability to hypoglycemia
School age (6–12 years)	90–180	100–180	<8%	• Risks of hypoglycemia and relatively low risk of complications prior to puberty
Adolescents and young adults (13–19 years)	90–130	90–150	<7.5%*	• Risk of hypoglycemia • Developmental and psychological issues

Key concepts in setting glycemic goals:

- Goals should be individualized and lower goals may be reasonable based on benefit–risk assessment
- Blood glucose goals should be higher than those listed above in children with frequent hypoglycemia or hypoglycemia unawareness
- Postprandial blood glucose values should be measured when there is a disparity between preprandial blood glucose values and A1C levels

*A lower goal (<7.0%) is reasonable if it can be achieved without excessive hypoglycemia

ADA. Diabetes care; 2019; 40 (s1): S11- 24

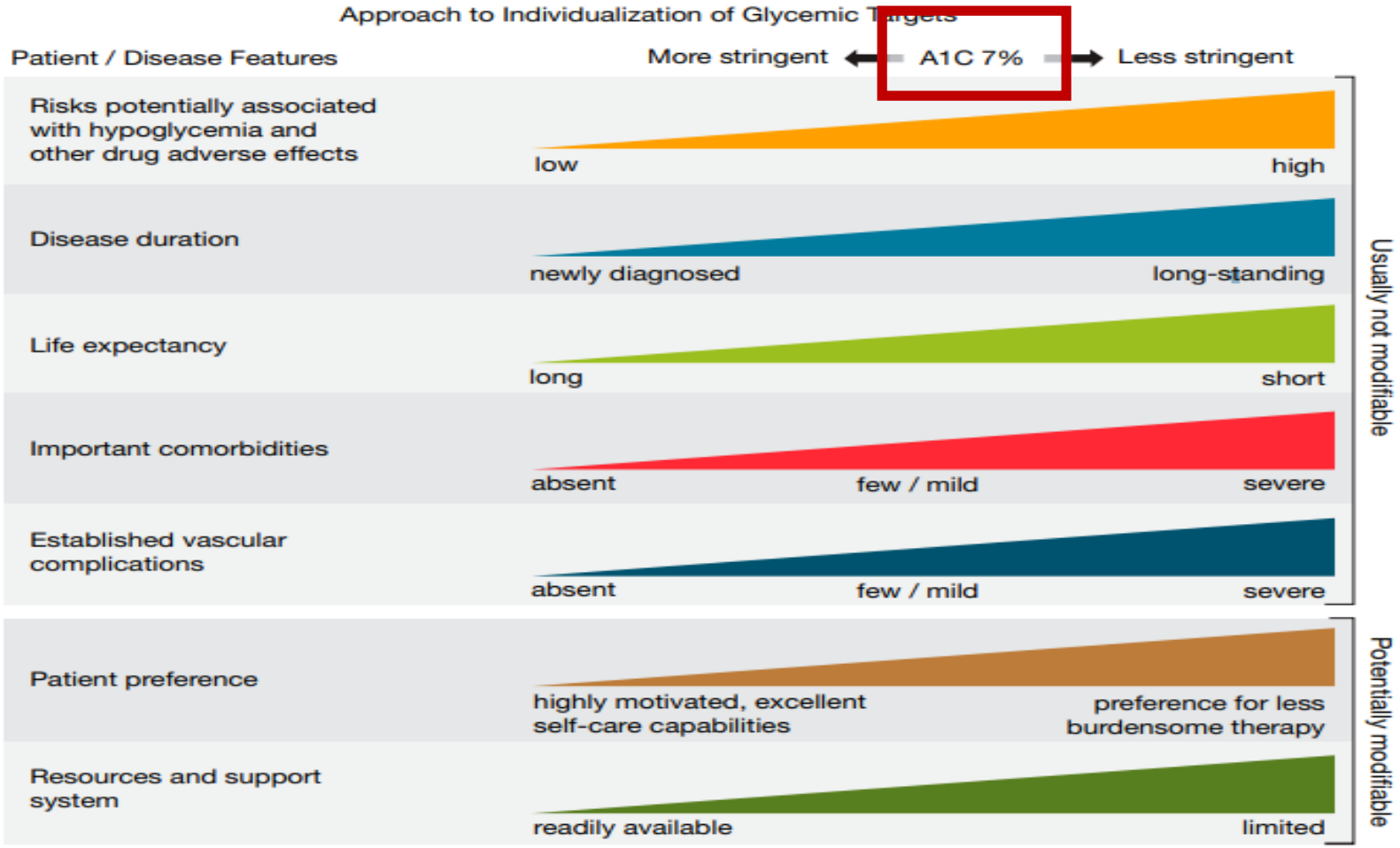

Figure 6.2—Patient and disease factors used to determine optimal glycemic targets. Characteristics and predicaments toward the left justify more stringent efforts to lower A1C; those toward the right suggest less stringent efforts. A1C 7% = 53 mmol/mol. Adapted with permission from Inzucchi et al. (71).

Recommendations for

screening and *treatment*

of complications and related

conditions in

pediatric type 1 diabetes

Recommendations for *screening* and *treatment* of complications and related conditions in *pediatric type 1 diabetes*

1. Thyroid disease

- Method: Thyroid-stimulating hormone; consider antithyroglobulin and antithyroid peroxidase antibodies
- When to start: Soon after diagnosis
- Follow-up frequency: Every 1–2 years if thyroid antibodies negative; more often if symptoms develop or presence of thyroid antibodies; at any time growth rate is abnormal
- Target: NA
- Treatment: Appropriate treatment of underlying thyroid disorder

ADA. Diabetes care; 2022; 46 (s1): S19- 40

Recommendations for *screening* and *treatment* of complications and related conditions in *pediatric type 1 diabetes* *(Cont'd)*

2. Celiac disease

- Method: IgA tTG if total IgA normal; IgG tTG and deamidated gliadin antibodies if IgA deficient
- When to start: Soon after diagnosis
- Follow-up frequency: Within 2 years and then at 5 years after diagnosis; sooner if symptoms develop
- Target: NA
- Treatment: After confirmation, start gluten-free diet

ADA. Diabetes care; 2022; 46 (s1): S19- 40

Recommendations for *screening* and *treatment* of complications and related conditions in *pediatric type 1 diabetes* *(Cont'd)*

- Evaluation for celiac disease should be considered if there is unsatisfactory weight gain that cannot be explained by poor metabolic control.

ADA. Diabetes care; 2019; 40 (s1): S11- 24

Recommendations for *screening* and *treatment* of complications and related conditions in *pediatric type 1 diabetes* *(Cont'd)*

3. Hypertension

Method: Blood pressure monitoring

When to start: At diagnosis

Follow-up frequency: Every visit

Target: < 90th percentile for age, sex, and height; if ≥13 years old, <120/80 mmHg

Treatment: Lifestyle modification for elevated blood pressure (90th to <95th percentile for age, sex, and height or, if ≥13 years old, 120–129/<80 mmHg); lifestyle modification and ACE inhibitor or ARB* for hypertension (≥95th percentile for age, sex, and height or, if ≥ 13 years old, ≥130/80 mmHg)

ADA. Diabetes care; 2022; 46 (s1): S19- 40

Recommendations for *screening* and *treatment* of complications and related conditions in *pediatric type 1 diabetes* *(Cont'd)*

4. Dyslipidemia

Method: Lipid profile, non-fasting acceptable initially

When to start: preferably after glycemia has improved and ≥ 2 years old

Follow-up frequency: If LDL ≤ 100 mg/dL, repeat at 9–11 years old; then, if <100 mg/dL, every 3 years

Target: LDL <100 mg/dL

Treatment: If abnormal, optimize glycemia and medical nutrition therapy; if after 6 months LDL >160 mg/dL or >130 mg/dL with cardiovascular risk factor(s), initiate statin therapy (for those aged >10 years)*

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Recommendations for *screening* and *treatment* of complications and related conditions in *pediatric type 1 diabetes* *(Cont'd)*

4. Dyslipidemia

- Non-HDL cholesterol:
- More predictive of persistent dyslipidemia and, therefore, atherosclerosis and future events than total cholesterol, LDL cholesterol, or HDL cholesterol levels alone
- As powerful as any other lipoprotein cholesterol measure in children and adolescents
- A major advantage: it can be accurately calculated in a non-fasting state

Youth with type 1 diabetes have a high prevalence of lipid abnormalities

Improved glycemia alone will not normalize lipids in youth with type 1 diabetes

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Recommendations for *screening* and *treatment* of complications and related conditions in *pediatric type 1 diabetes* *(Cont'd)*

5. Nephropathy

Method: Albumin-to-creatinine ratio; random sample acceptable initially

When to start: Puberty or >10 years old, whichever is earlier, and diabetes duration of 5 years

Follow-up frequency: If normal, annually; if abnormal, repeat with confirmation in two of three samples over 6 months

Target: Albumin-to-creatinine ratio <30 mg/g

Treatment: Optimize glycemia and blood pressure; ACE inhibitor* if albuminto- creatinine ratio is elevated in two of three samples over 6 months

ADA. Diabetes care; 2022; 46 (s1): S19- 40

Recommendations for *screening* and *treatment* of complications and related conditions in *pediatric type 1 diabetes* *(Cont'd)*

6. Retinopathy

Method: Dilated fundoscopy or retinal photography

When to start: Puberty or ≥11 years old, whichever is earlier, and diabetes duration of 3–5 years

Follow-up frequency: If normal, every 2 years; consider less frequently (every 4 years) if A1C <8% and eye professional agrees

Target: No retinopathy

Treatment: Optimize glycemia; treatment per ophthalmology

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Recommendations for *screening* and *treatment* of complications and related conditions in *pediatric type 1 diabetes* *(Cont'd)*

6. Neuropathy

Method: Foot exam with foot pulses, pinprick, 10-g monofilament sensation tests, vibration, and ankle reflexes

When to start: Puberty or ≥ 10 years old, whichever is earlier, and diabetes duration of 5 years

Follow-up frequency: If normal, annually

Target: No neuropathy

Treatment: Optimize glycemia; referral to neurology

ADA. Diabetes care; 2022; 46 (s1): S19- 40

Recommendations for *screening* and *treatment* of complications and related conditions in *pediatric type 1 diabetes* *(Cont'd)*

- Hypoglycemia in children
- All children and adolescents should have height and weight plotted on the CDC growth curves at each clinic visit

ADA. Diabetes care; 2019; 40 (s1): S11- 24

Type 2 Diabetes in Adolescents and Youth (TODAY)

Type 2 Diabetes in Adolescents and Youth (TODAY)

Type 2 diabetes in youth is different not only from type 1 diabetes but also from type 2 diabetes in adults:

- Has unique features, such as a more rapidly progressive decline in β-cell function
- Accelerated development of diabetes complications

ADA. Diabetes care; 2022; 46 (s1): S19- 40

Type 2 Diabetes in Adolescents and Youth (TODAY) *(cont'd)*

- Long-term follow-up data from the Treatment Options for Type 2 Diabetes in Adolescents and Youth (TODAY) study showed that a majority of individuals with type 2 diabetes diagnosed as youth had microvascular complications by young adulthood

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Type 2 Diabetes in Adolescents and Youth (TODAY) *(cont'd)*

Risk-based screening for TODAY:

- After the onset of puberty
- ≥ 10 years of age
- whichever *occurs earlier*, in youth with *overweight* (BMI ≥85th percentile) or *obesity* (BMI ≥ 95th percentile)
- who have one or more additional risk factors
  - Maternal history of diabetes or GDM during the child' gestation
  - Family history of diabetes in the first or second degree relative
  - Female sex
  - Low socioeconomic status
  - Signs of insulin resistance or condition associated with insulin resistance such as hypertension, dyslipidemia, PCO, SGA

ADA. Diabetes care; 2022; 46 (s1): S19- 40

Type 2 Diabetes in Adolescents and Youth (TODAY) *(cont'd)*

- If screening is normal, repeat screening at a minimum of 3-year intervals , or more frequently if BMI is increasing

- *Fasting plasma glucose*, *2-h plasma glucose* during a 75-g oral glucose tolerance test, and *A1C* can be used to test for prediabetes or diabetes in children and adolescents

ADA. Diabetes care; 2022; 46 (s1): S19- 40

Table 14.1*B*—Recommendations for screening and treatment of complications and related conditions in pediatric type 2 diabetes

	Hypertension	Nephropathy	Neuropathy	Retinopathy	Nonalcoholic fatty liver disease	Obstructive sleep apnea	Polycystic ovarian syndrome (for adolescent female individuals)	Dyslipidemia
Corresponding recommendations	14.77–14.80	14.81–14.86	14.87 and 14.88	14.89–14.92	14.93 and 14.94	14.95	14.96–14.98	14.100–14.104
Method	Blood pressure monitoring	Albumin-to-creatinine ratio; random sample acceptable initially	Foot exam with foot pulses, pinprick, 10-g monofilament sensation tests, vibration, and ankle reflexes	Dilated fundoscopy	AST and ALT measurement	Screening for symptoms	Screening for symptoms; laboratory evaluation if positive symptoms	Lipid profile
When to start	At diagnosis	At diagnosis	At diagnosis	At/soon after diagnosis	At diagnosis	At diagnosis	At diagnosis	Soon after diagnosis, preferably after glycemia has improved
Follow-up frequency	Every visit	If normal, annually; if abnormal, repeat with confirmation in two of three samples over 6 months	If normal, annually	If normal, annually	Annually	Every visit	Every visit	Annually
Target	<90th percentile for age, sex, and height; if ≥13 years old, <130/80 mmHg	<30 mg/g	No neuropathy	No retinopathy	NA	NA	NA	LDL <100 mg/dL, HDL >35 mg/dL, triglycerides <150 mg/dL
Treatment	Lifestyle modification for elevated blood pressure (90th to	Optimize glycemia and blood pressure; ACE	Optimize glycemia; referral to neurology	Optimize glycemia; treatment per ophthalmology	Refer to gastro-enterology for persistently	If positive symptoms, refer to sleep specialist and	If no contra-indications, oral contraceptive pills;	If abnormal, optimize glycemia and medical nutrition therapy; if

Lifestyle management

- Comprehensive diabetes self-management education: All youth with type 2 diabetes and their families
- Comprehensive lifestyle programs that are integrated with diabetes management
- Achieve a **7–10**% decrease in excess weight

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Lifestyle management

- At least *60 min of moderate to vigorous physical activity daily* (with muscle and bone strength training at least 3 days/week) and to decrease sedentary behavior

- Healthy eating patterns that emphasize consumption of nutrient-dense, high-quality foods and decreased consumption of calorie-dense, nutrient-poor foods, particularly sugar-added beverages

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Type 2 Diabetes in Adolescents and Youth (TODAY) *(cont'd)*

- The ADA position statement:

Diabetes Care for Emerging Adults:

Recommendations for Transition From Pediatric to

Adult Diabetes Care Systems

ADA. Diabetes care; 2022; 46 (s1): S19- 40

MEDICAL NUTRITION THERAPY

(MNT)

Medial Nutrition Therapy (MNT)

Nutrition Therapy

Recommendations:

- *Individualized medical nutrition therapy* is recommended for youth with type 1 diabetes as an essential component of the overall treatment plan

- *Monitoring carbohydrate intake,* whether by carbohydrate counting or experience-based estimation, is a *key component* to optimizing glycemic management

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Medial Nutrition Therapy (MNT)

Nutrition Therapy

- *Comprehensive nutrition education* at diagnosis, *with annual updates*, by an experienced registered dietitian nutritionist
- *Assess caloric and nutrition intake* in relation to *weight status and cardiovascular disease risk factors*
- Inform macronutrient choices

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Medial Nutrition Therapy (MNT)

- ***Activity/exercise schedules*** need to be assessed, along with ***24-hour recall and 3-day food diary*** to determine ***energy intake***

- *Growth patterns* and *weight gain* need to be assessed *every 3-6 months* and recommended dietary advice adjusted accordingly.

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Dietary Recommendation

Dietary recommendations

The ***general guidelines*** for macronutrients are ***similar*** to that of the ***adult population with diabetes***

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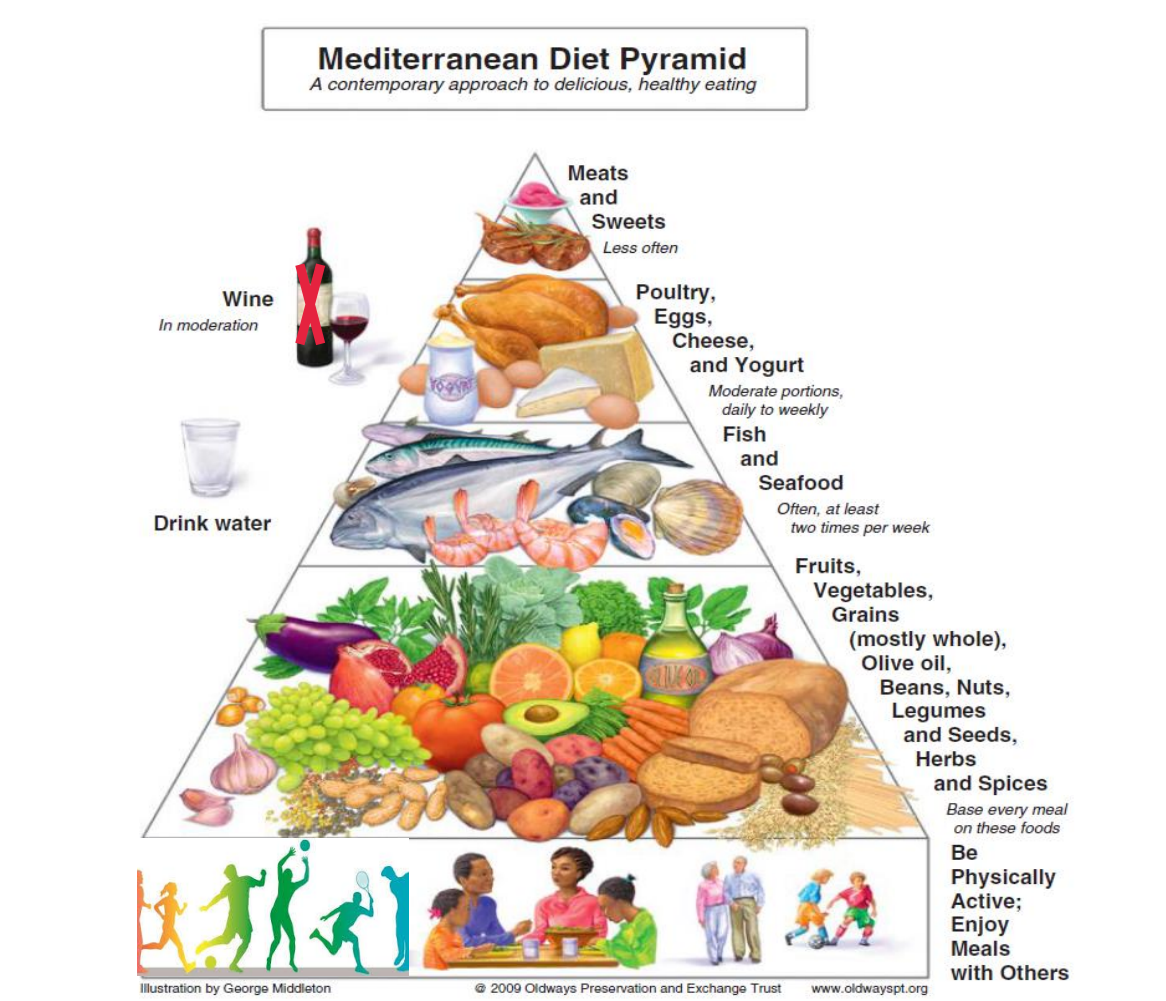
Dietary recommendations

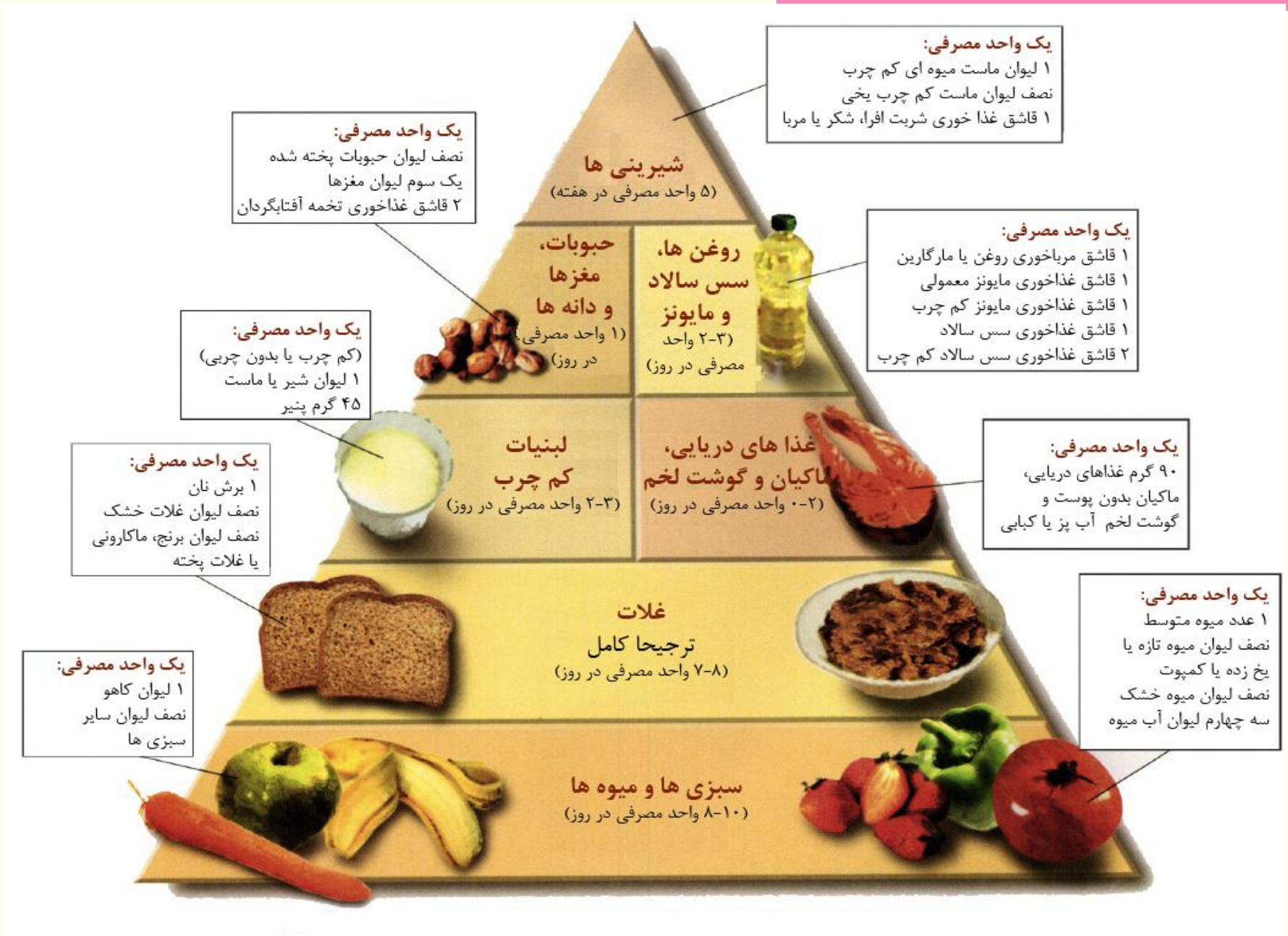
Plate method:

- Half the plate should consist of fruits and vegetables
- Other half is divided between whole grains and lean sources of protein

- The dairy is represented by a glass of nonfat or 1% milk or other nonfat or low-fat dairy source



- Krause's food & nutrition care process,14th edition; 2017, p 657-9


یک واحد مصرفی:
۱ لیوان ماست میوه ای کم چرب
نصف لیوان ماست کم چرب یخی
۱ قاشق غذا خوری شربت افرا، شکر یا مربا
شیرینی ها
(۵ واحد مصرفی در هفته)
یک واحد مصرفی:
نصف لیوان حبوبات پخته شده
یک سوم لیوان مغزها
۲ قاشق غذاخوری تخمه آفتابگردان
حبوبات، مغزها و دانه ها
(۱ واحد مصرفی در روز)
روغن ها، سس سالاد و مایونز
(۳-۲ واحد مصرفی در روز)
یک واحد مصرفی:
۱ قاشق مرباخوری روغن یا مارگارین
۱ قاشق غذاخوری مایونز معمولی
۱ قاشق غذاخوری مایونز کم چرب
۱ قاشق غذاخوری سس سالاد
۲ قاشق غذاخوری سس سالاد کم چرب
یک واحد مصرفی:
(کم چرب یا بدون چربی)
۱ لیوان شیر یا ماست
۴۵ گرم پنیر
لبنیات کم چرب
(۳-۲ واحد مصرفی در روز)
غذا های دریایی، ماکیان و گوشت لخم
(۲-۰ واحد مصرفی در روز)
یک واحد مصرفی:
۹۰ گرم غذاهای دریایی،
ماکیان بدون پوست و
گوشت لخم آب پز یا کبابی
یک واحد مصرفی:
۱ برش نان
نصف لیوان غلات خشک
نصف لیوان برنج، ماکارونی
یا غلات پخته
غلات ترجیحا کامل
(۸-۷ واحد مصرفی در روز)
یک واحد مصرفی:
۱ عدد میوه متوسط
نصف لیوان میوه تازه یا
یخ زده یا کمپوت
نصف لیوان میوه خشک
سه چهارم لیوان آب میوه
یک واحد مصرفی:
۱ لیوان کاهو
نصف لیوان سایر
سبزی ها
سبزی ها و میوه ها
(۱۰-۸ واحد مصرفی در روز)

هرم راهنمای غذایی ایرانی

http://www.fao.org/nutrition/education/food-based-dietary-guidelines/regions/countries/iran/en/

Food groups and intermediate disease markers: a systematic review and network meta-analysis of randomized trials

Lukas Schwingshackl,[1,2] *Georg Hoffmann,*[3] *Khalid Iqbal,*[1] *Carolina Schwedhelm,*[1,2] *and Heiner Boeing*[1,2]

[1]Department of Epidemiology, German Institute of Human Nutrition Potsdam-Rehbruecke (DIfE), Nuthetal, Germany; [2]NutriAct – Competence Cluster Nutrition Research Berlin-Potsdam, Germany; and [3]Department of Nutritional Sciences, University of Vienna, Vienna, Austria

Results: A total of 66 randomized trials (86 reports) comparing 10 food groups and enrolling 3595 participants was identified. Nuts were ranked as the best food group at reducing LDL cholesterol (SUCRA: 93%), followed by legumes (85%) and whole grains (70%). For reducing TG, fish (97%) was ranked best, followed by nuts (78%) and red meat (72%). However, these findings are limited by the low quality of the evidence. When combining all 10 outcomes, the highest SUCRA values were found for nuts (66%), legumes (62%), and whole grains (62%), whereas SSBs performed worst (29%).

Conclusion: The present NMA provides evidence that increased intake of nuts, legumes, and whole grains is more effective at improving metabolic health than other food groups. For the credibility of diet-disease relations, high-quality randomized trials focusing on well-established intermediate-disease markers could play an important role. This systematic review was registered at PROSPERO (www.crd.york.ac.uk/PROSPERO) as CRD42018086753. *Am J Clin Nutr* 2018;108:576–586.

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2021, VOL. 61, NO. 1, 85–96
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REVIEW

Benefits of pulse consumption on metabolism and health: A systematic review of randomized controlled trials

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ABSTRACT

Pulses are nutrient-dense foods that have for a long time been empirically known to have beneficial effects in human health. In the last decade, several studies have gathered evidence of the metabolic benefits of pulse intake. However, it remains unclear at what amounts these effects may be attained. This study aimed to systematically review the scientific outputs of the last two decades regarding health benefits of pulse consumption and the amounts necessary for positive outcomes to be achieved. A PubMed search including keywords [("dietary pulses", "pulses", "legumes", "grain legumes", "bean", "chickpea", "pea", "lentil", "cowpea", "faba bean", "lupin") and ("inflammation", "inflammatory markers", "C-reactive protein", "blood lipids", "cholesterol", "cardiometabolic health", "cardiovascular disease", "diabetes", "glycaemia", "insulin", "HOMA-IR", "body weight", "body fat", "obesity", "overweight", "metabolome", "metabolic profile", "metabolomics", "biomarkers", "microbiome", "microbiota", "gut")] was performed. Only English written papers referring to human dietary interventions, longer than one day, focusing on whole pulses intake, were included. Most of the twenty eligible publications reported improvements in blood lipid profile, blood pressure, inflammation biomarkers, as well as, in body composition, resulting from pulse daily amounts of 150 g (minimum-maximum: 54-360 g/day; cooked). Concerns regarding methodological approaches are evident and the biochemical mechanisms underlying such effects require further investigation.

KEYWORDS

Biomarkers; cardiovascular risk factors; ingestion; legume grains; well-being

Exercise

Exercise

- Goal of physical activity for all youth with type 1 diabetes:
  - ***60 min*** of *moderate- to vigorous-intensity aerobic activity daily*

+

  - Vigorous muscle-strengthening and bone-strengthening activities at least 3 days per week

ADA. Diabetes care; 2022; 46 (s1): S19- 40

Exercise

FPG targets prior to physical activity and exercise: **126–180** mg/dL

- individualized based on the *type, intensity, and duration of activity*

Prevent hypoglycemia:

- In low- to moderate-intensity aerobic activities (30–60 min) :

  Consume 10–15 g of carbohydrate

- After insulin boluses (relative hyperinsulinemia)

  consider 0.5–1.0 g of carbohydrates/kg per hour of exercise (30–60 g)

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MNT recommendation for diabetes

Carbohydrate counting

- *Aim*
- *Effectiveness*
- *Often used for:*
- *Starchy foods*
- *Carbohydrate distribution in meals*
- *Insulin carbohydrate ratio*

Carbohydrate counting *(cont'd)*

Insulin carbohydrate ratio:

- Adults: **1 unit of insulin** for every **10 to 15 grams of carbohydrate**
- School-age child: **1 unit of insulin** for every **20 to 30 grams of carbohydrate**

However:

careful monitoring of blood glucose and individual response should be evaluated to individualize the ratio.

Kulkarni, KH; Carbohydrate Counting: A practical meal planning option for people with diabetes; Clin Diab 2005 23, (3) 120-22

Gluten Free diet

Only treatment for CD: elimination of gluten peptides

- Delete gluten Source: wheat, rye, barley
- Substitute with corn, potato, rice, soybean, oats

Nutritional assessment in CD

Assessment:

- Anemia (Fe, folate or B12)
  - Ferritin
  - Red blood cell folate
- 25-OH vitamin D
- Bone density
- Weight loss and diarrhea:
  - Fat soluble vitamins (A, E, K)
  - Mineral (Ze)
- Secondary outcome: lactose and fructose intolerance
  - Low lactose- low fructose diet

معرفی بیمار

Subjective

بیمار آقای علی ط. مبتلا به **دیابت نوع ۱**

- **سن: ۹ سال**
- **تاریخچه پزشکی**

بیمار یک سال است که مشخص شده به دیابت نوع ۱ مبتلا شده است

- **سابقه فامیلی:**

پدر، عمو مبتلا به دیابت نوع ۱

عمه مبتلا به دیابت نوع ۲

- **فعالیت بدنی:**

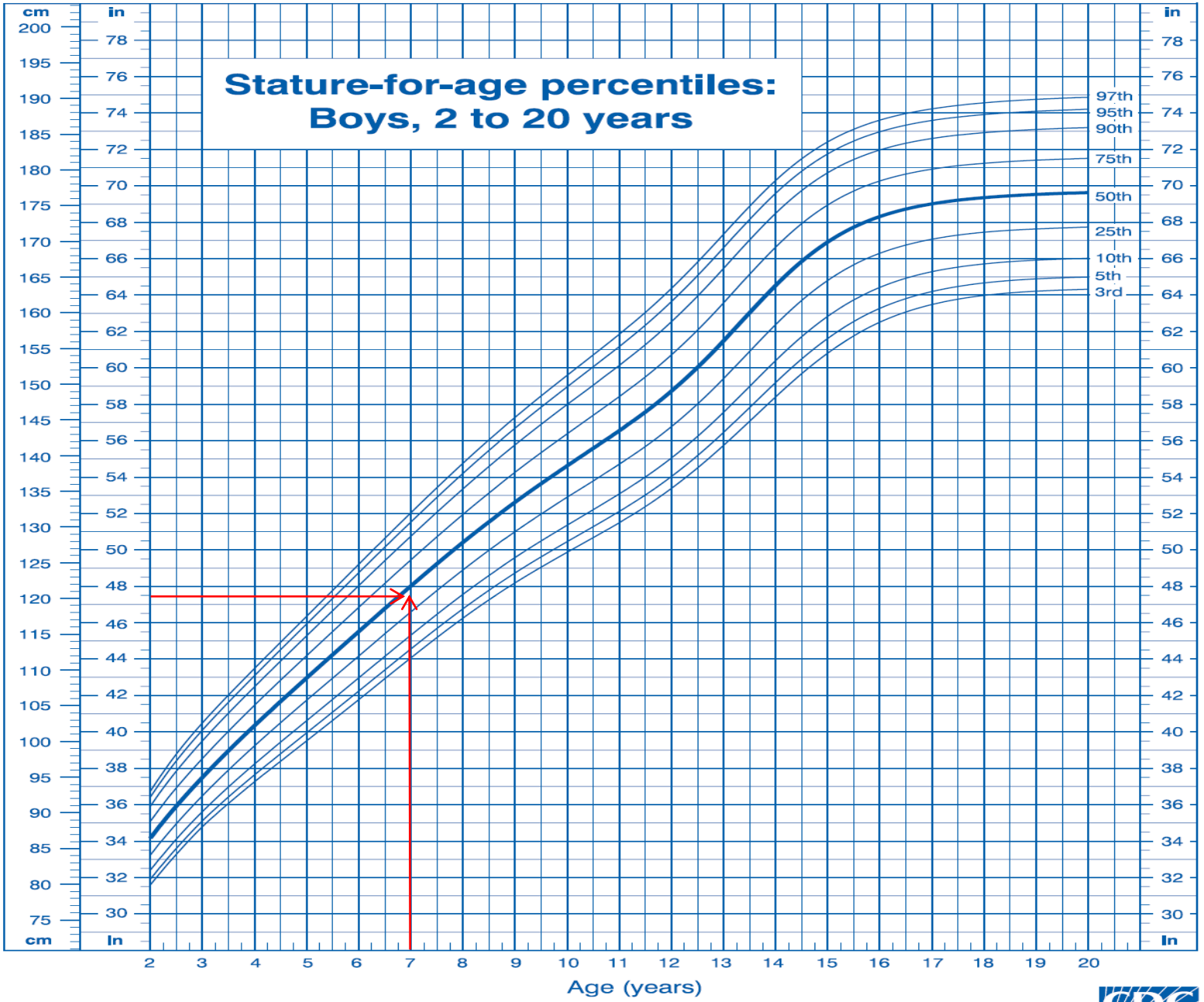
سبک (فقط در حد پیاده روی از منزل تا مدرسه)

Objective

داده های تن سنجی:

- **وزن** : **۲۰** کیلوگرم
- **قد** : **۱۲۰** سانتی متر

- $BMI=20/(1.20)^2 =$ ***13.8***


Stature-for-age percentiles:
Boys, 2 to 20 years
cm
in
97th
95th
90th
75th
50th
25th
10th
5th
3rd
Age (years)
Published May 30, 2000.
SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).
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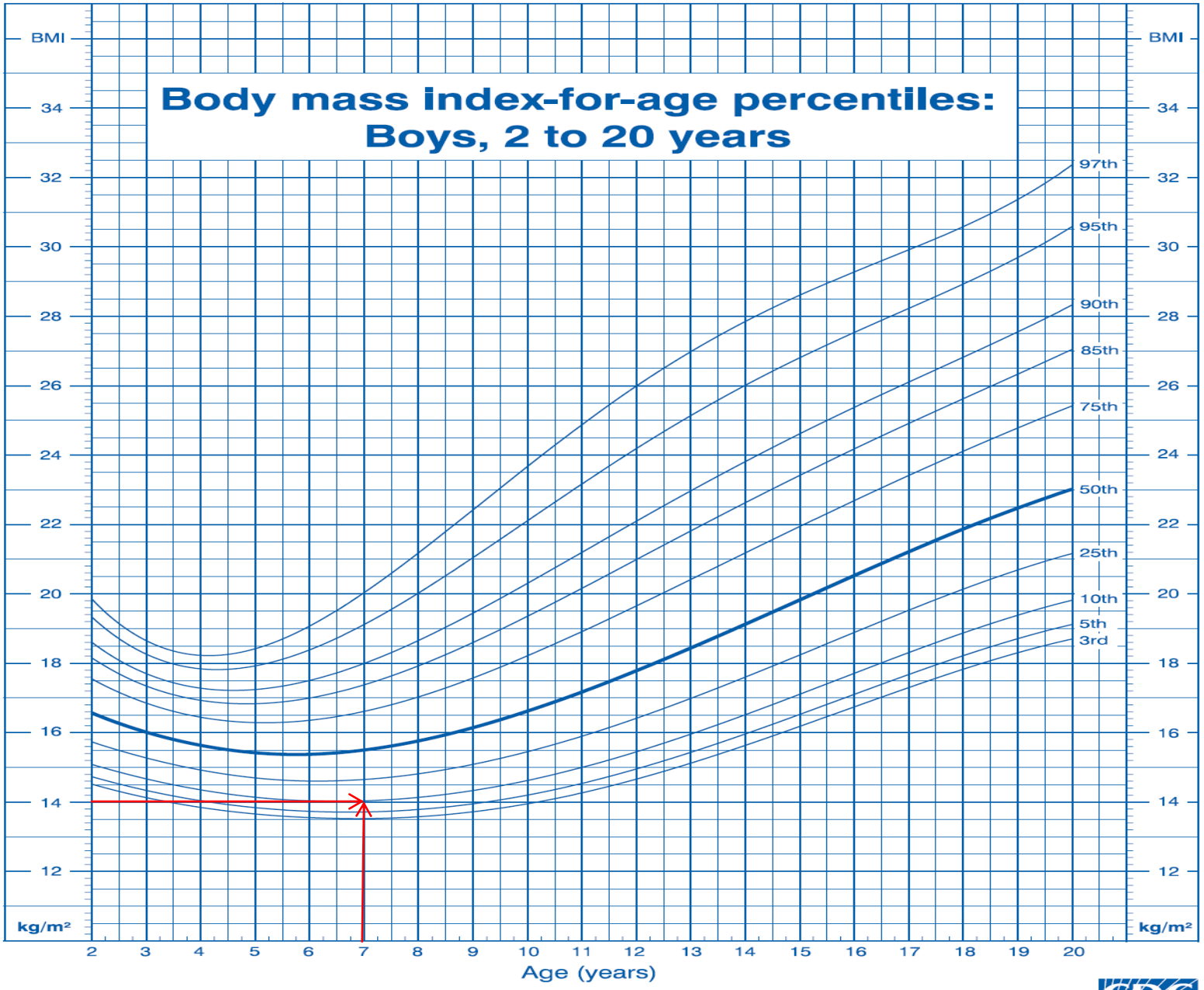
Body mass index-for-age percentiles:
Boys, 2 to 20 years
BMI
kg/m²
Age (years)
97th
95th
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85th
75th
50th
25th
10th
5th
3rd
Published May 30, 2000.
SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion
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Objective

آزمایش خون

Test	Result
Before meals (BS)	186 mg/dl
Bedtime (BS)	218 mg/dl
HbA1C	**8%**

Values by age	Plasma blood glucose goal range (mg/dl)		A1C	Rationale
	Before meals	Bedtime/overnight		
Toddlers and preschoolers (<6 years)	100–180	110–200	<8.5 (but >7.5) %	• High risk and vulnerability to hypoglycemia
School age (6–12 years)	90–180	100–180	<8%	• Risks of hypoglycemia and relatively low risk of complications prior to puberty
Adolescents and young adults (13–19 years)	90–130	90–150	<7.5%*	• Risk of hypoglycemia • Developmental and psychological issues

Subjective

- **یادآمد خوراک ۲٤ ساعته (یک روز تعطیل):**

تزریق انسولین aspart (٤ واحد): ۸ صبح

صبحانه (۸:۳۰)

نان تست: ۲کف دست

- پنیر ۱ قوطی کبریت
- خیار ۱ عدد+ یک عدد گوجه فرنگی
- چای ۱ لیوان + ۱ عدد خرما

تزریق انسولین aspart (٦ واحد): ۱۲ ظهر

ناهار: ۱۲:۳۰

- ماهی قزل آلای سرخ شده ۱ عدد متوسط
- برنج ۱۰قاشق غ
- دلستر ۱ لیوان

Subjective

یادآمد خوراک ۲٤ ساعته(یک روز تعطیل): (ادامه)

عصرانه (ساعت ١٦):

- سه عدد بیسکویت
- یک عدد پرتقال

تزریق انسولین aspart (٤ واحد): ۱۸عصر

شام: ۱۸:۳۰

- کباب (یک سیخ) + گوجه فرنگی ۱عدد
- برنج ۱۰ قاشق غذاخوری
- ماست نصف لیوان

وعده قبل از خواب ساعت : ۲۱

- ۱ لیوان شیر پرچرب (۲.۵ ٪)
- تزریق انسولین glargine (١٦ واحد): ۹ شب

Subjective

- **یادآمد خوراک ۲۴ ساعته (یک روز معمولی):**

تزریق انسولین aspart (٤ واحد): ۸ صبح

صبحانه (۸:۳۰)

نان تست: ۲کف دست

- پنیر ۱ قوطی کبریت
- خامه دو قاشق مرباخوری+ مربای یک قاشق غذاخوری
- چای ۱ لیوان
- **میان وعده:**
- یک عدد سیب
- یک عدد کیک با آبمیوه صنعتی
- **تزریق انسولین aspart (٦ واحد): ۱۲ ظهر**

ناهار: ۱۲-۱۳

- خورش قیمه (کدو یک عدد، ۳ تکه گوشت خورشتی، ۳ قاشق غذاخوری لپه، یک قاشق غذاخوری روغن)
- برنج ۱۰قاشق غ
- دلستر ۱ لیوان

Subjective

یادآمد خوراک ۲٤ ساعته(یک روز معمولی): (ادامه)

عصرانه (ساعت ١٦):

- یک لیوان بستنی
- ۱۰ عدد کشمش و نخودچی

تزریق انسولین aspart (٤ واحد): ۱۸عصر

شام: ۱۸:۳۰

- یک عدد سیب زمینی متوسط + یک عدد تخم مرغ آب پز+ یک قاشق مرباخوری کره
- ۳ کف دست نان لواش
- یک لیوان دوغ صنعتی

وعده قبل از خواب ساعت : ۲۱

- ۱ لیوان شیر پرچرب (۲.۵ ٪) + یک عدد کیک یزدی

تزریق انسولین glargine (١٦ واحد): ۹ شب

Subjective

عادات غذایی بیمار:

- ✓ غذاهای آماده مانند پیتزا و ساندویچ را دوست دارد و روزی یک بار در مدرسه غذاهای آماده می خورد.
- ✓ تمایل به مصرف مربا، کره، خامه، ارده و شیره دارد.
- ✓ میان وعده کیک، پفیلا، پفک، شکلات را ترجیح می دهد.
- ✓ نوشابه و دلستر دوست دارد.
- ✓ بعد از پخت غذا نمک اضافه می کند.

Assessment

بررسی کفایت تغذیه ای

جدول امتیاز دهی کفایت وتنوع غذایی آقای علی ط در روز تعطیل

غذای دریافتی	تعداد واحدهای دریافتی از هر گروه غذایی				
	نان، غلات ...	سبزی ها	میوه ها	شیر ...	گوشت ...
صبحانه نان تست دو کف دست، پنیر یک قوطی کبریت، خیار یک عدد، گوجه فرنگی یک عدد، یک عدد خرما	2	2	0/6	0/6	
ناهار: ماهی یک عدد قزل الای سرخ شده، برنج 10 قاشق غذاخوری، دلستر یک لیوان	2				2
میان وعده عصر: سه عدد بیسکویت،	1				

Assessment

ادامه **بررسی کفایت تغذیه ای**

جدول امتیاز دهی کفایت وتنوع غذایی آقای علی ط در روز تعطیل:

غذاهای دریافتی	تعداد واحدهای دریافتی از هر گروه غذایی					
	نان، غلات ...	سبزی ها	میوه ها	شیر ...	حبوبات و مغزها	گوشت ...
شام: کباب یک سیخ، گوجه فرنگی یک عدد، برنج 10 قاشق غذاخوری، ماست نصف لیوان	2	1		0/5		1/5
میان وعده قبل از خواب: یک لیوان شیر پرچرب				1		
جمع واحدهای مصرفی	7	3	0/6	2	0	3/5
جمع واحدهای توصیه شده برای 2200کیلوکالری	9	4	3	3-2	1	1/5
امتیاز کفایت علی: 37	7.7	7/5	2	10	0	10

(۵÷۹) *۱۰ =۵/۵

زیرگروه های غذایی جهت امتیاز تنوع غذایی

نان و غلات (2 امتیاز)

- برنج و نان های سفید، باگت، ماکارونی، کلوچه و انواع شیرینی و بیسکویت
- برنج قهوه ای، نانهای سنتی و سبوس دار مانند سنگگ، غلات کامل مانند جو، بلغور، گندم

سبزی ها (2 امتیاز)

- سبزی های برگ سبز تیره مانند سبزی خوردن، اسفناج، براکلی
- سبزی های نشاسته ای مانند سیب زمینی، باقلا، نخود فرنگی، ذرت
- سبزی های قرمز، زرد و نارنجی مانند گوجه فرنگی، هویج، کدوحلوایی، فلفل دلمه ای
- سایر انواع سبزی ها شامل انواع کلم، قارچ، پیاز، تره فرنگی، سیر

میوه ها (2 امتیاز)

- انواع مرکبات، صیفی جات، توتها
- سایر انواع میوه و آب میوه

گوشت و تخم مرغ (1 امتیاز)

- انواع گوشتهای قرمز، سفید و ماهی
- تخم مرغ

زیرگروه های غذایی جهت امتیاز تنوع غذایی		
حبوبات و مغزها (1 امتیاز)		
• حبوبات • مغزها		
شیر و فراورده های آن (1 امتیاز)		
• شیر • ماست/دوغ/کشک • انواع پنیر		

نان و غلات: 1 امتیاز
سبزی ها: 1 امتیاز
میوه ها: 1 امتیاز
گوشت و تخم مرغ: 1 امتیاز
حبوبات ومغزها: 0 امتیاز
شیر و فراورده های آن: 2 امتیاز

مجموع: 6 امتیاز

Assessment

ادامه **بررسی کفایت تنوع تغذیه ای**

نمره امتیاز از ۶ گروه غذایی: **۳۷ از ۵۰**

نمره امتیاز تنوع غذایی: **۶**

امتیاز کل **۴۳** = ۶+۳۷

خصوصیات رژیم غذایی	امتیاز
تنوع وانتخاب عالی است	۷۰
کفایت وتنوع رژیم تا حدی مناسب	۶۰-۶۹
رژیم غذایی بایستی بررسی و اصلاح گردد	**<۶۰**

- با توجه به نیاز علی، مصرف گروه میوه ها، سبزی ها، نان و غلات، حبوبات و مغزها باید افزایش یابد و متنوع تر شود.

Assessment

بررسی کفایت تغذیه ای

جدول امتیاز دهی کفایت وتنوع غذایی آقای علی ط در یک روز معمولی

غذای دریافتی	تعداد واحدهای دریافتی از هر گروه غذایی					
	نان، غلات ...	سبزی ها	میوه ها	شیر ...	حبوبات و مغزها	گوشت ...
صبحانه نان تست: 2 کف دست، پنیر یک قوطی کبریت، خامه دو قاشق مرباخوری، مربا یک قاشق غذاخوری، چای یک لیوان	2			0/6		
میان وعده عصر یک عدد سیب، یک عدد کیک با آبمیوه صنعتی			1			
ناهار کدو یک عدد، 3 تکه گوشت خورشتی، 3 قاشق غذاخوری لپه، برنج 10 قاشق غذاخوری، دلستر یک لیوان	2	1			1	1
عصرانه یک لیوان بستنی، یک عدد پرتقال			1			

Assessment

ادامه **بررسی کفایت تغذیه ای**

جدول امتیاز دهی کفایت وتنوع غذایی آقای علی ط در یک روز معمولی:

غذاهای دریافتی	تعداد واحدهای دریافتی از هر گروه غذایی					
	نان، غلات ...	سبزی ها	میوه ها	شیر ...	حبوبات و مغزها	گوشت ...
شام: یک عدد سیب زمینی متوسط+ یک عدد تخم مرغ آب پز + 3 کف دست نان لواش + یک لیوان دوغ	1	1		0.5		1
میان وعده قبل از خواب: یک لیوان شیر + یک عدد کیک یزدی				1		
جمع واحدهای مصرفی	5	2	2	2	1	2
جمع واحدهای توصیه شده برای 2200کیلوکالری	9	4	3	3-2	1	1/5
امتیاز کفایت علی: 47	5/5	5	6.6	10	10	10

(۵÷۹) *۱۰ =۵/۵

نان و غلات: 1 امتیاز
سبزی ها: 1 امتیاز
میوه ها: 2 امتیاز
گوشت و تخم مرغ: 1 امتیاز
حبوبات ومغزها: 1 امتیاز
شیر و فراورده های آن: 2 امتیاز

مجموع: 8 امتیاز

Assessment

ادامه **بررسی کفایت تنوع تغذیه ای در یک روز معمول**

نمره امتیاز از ۵ گروه غذایی: **۴۷ از ۵۰**

نمره امتیاز تنوع غذایی: **۶**

امتیاز کل **۵۳** = ۶+۴۷

خصوصیات رژیم غذایی	امتیاز
تنوع وانتخاب عالی است	۷۰
کفایت وتنوع رژیم تا حدی مناسب	۶۰ – ۶۹
رژیم غذایی بایستی بررسی و اصلاح گردد	**< ۶۰**

با توجه به نیاز علی، مصرف گروه میوه ها، سبزی ها، نان و غلات باید افزایش یابد و متنوع تر شود.


درسنامه
اصول تنظیم برنامه غذایی
تألیف:
پروین میرمیران
گلاله اصغری
۱۳۹۸

روش محاسبه مصرف انرژی مورد نیاز روزانه علی

روش اول: محاسبه انرژی مورد نیاز در کودکان و نوجوانان

سن (سال)	کیلو کالری به ازای هر سانتی متر قد
۱-۳	۱۵
۴-۶	۱۶
۷-۱۰	۱۵
پسران	
۱۱-۱٤	۱۶
۱۵-۱۸	۱۷
دختران	
۱۱-۱٤	۱٤
۱۵-۱۸	۱۳/۵

محاسبه انرژی برای کودکان و نوجوانان با فعالیت های معمول می باشد و در صورت فعالیت های ورزشی می بایست مقدار انرژی صرف شده برای فعالیت ورزشی به آن اضافه شود.

روش دوم: محاسبه انرژی بر اساس فرمول های پیش بینی کننده تخمین انرژی مصرفی

EER پسران ۸-۳ سال (بین صدک ۵ تا ۸۵ نمایه توده بدنی)†:

EER= TEE + Energy deposition

EER = ۸۸/۵ − ۶۱/۹ × سن (سال) + PA ×(۲۶/۷ × وزن [Kg] + ۹۰۳ × قد [m]) + ۲۰ (کیلوکالری برای ذخیره بافت‌ها)

EER پسران ۱۸-۹ سال (بین صدک ۵ تا ۸۵ نمایه توده بدنی)†:

EER= TEE + Energy deposition

EER = ۸۸/۵ − ۶۱/۹ × سن (سال) + PA ×(۲۶/۷ × وزن [Kg] + ۹۰۳ × قد [m]) + ۲۵ (کیلوکالری برای ذخیره بافت‌ها)

ضریب فعالیت بدنی برای پسران ۱۸-۳ سال =PA

PA = ۱/۰؛ در صورتیکه PAL بزرگتر یا مساوی ۱ و کمتر از ۱/۴ باشد (بی‌تحرک)

PA = ۱/۱۳؛ در صورتیکه PAL بزرگتر یا مساوی ۱/۴ و کمتر از ۱/۶ باشد (کم فعال)

PA = ۱/۲۶؛ در صورتیکه PAL بزرگتر یا مساوی ۱/۶ و کمتر از ۱/۹ باشد (فعال)

PA = ۱/۴۲؛ در صورتیکه PAL بزرگتر یا مساوی ۱/۹ و کمتر از ۲/۵ باشد (بسیار فعال)

Mahan LK, Raymond JL. Energy. Krause's Food and the Nutrition Care Process. 14th ed. United States: Saunders. 2017; P:17-27.

پاسخ

- نمودار قد برای سن، حدود ۵۰: قد طبیعی
- نمودار BMI برای سن (CDC): صدک ۱۰: مبتلا به کاهش وزن

محاسبه انرژی مورد نیاز (برمبنای قد):

روش اول: ۱۲۰×۱۵=۱۸۰۰ Kcal

روش دوم:

TEE =۸۸/۵- ۶۱/۹ × ۹ (سال) + ۱/۱۳ × (۲۶/۷ ×۲۰ +۹۰۳ × ۱/۲۰) + 20=۱۵۰۳

انرژی مورد نیاز برای نگهداری وزن ۱۸۰۰+۱۵۰۳=۲۵۵۱÷۲=**۱۶۵۱**

با توجه به کم وزن بودن علی لازم است که جهت افزایش وزن در ابتدا ۳۵۰ کیلوکالری به کالری مورد نیاز وی که بر اساس نگهداری وزن است، اضافه شود.

Krauses Food & The Nutrition Care Process. 2012.

Assessment

درصد درشت مغذی ها از کل کالری آقای علی

کالری مورد نیاز:کیلوکالری ۲۰۰۰=۱۶۵۱+۳۵۰

Pro=18% × 2000=360 ÷ 4 = **90**g

Fat = 32 % ×2000=640 ÷ 9 = **71** g

CHO = 50% × 2000=1000 ÷ 4 = **250**g

Assessment

محاسبه قند ساده رژیم غذایی:

Sucrose intakes **up to 10%** of total energy intake do not have a negative effect on glycemic or lipid responses when substituted for isocaloric amounts of starch. (Krause's 2017)

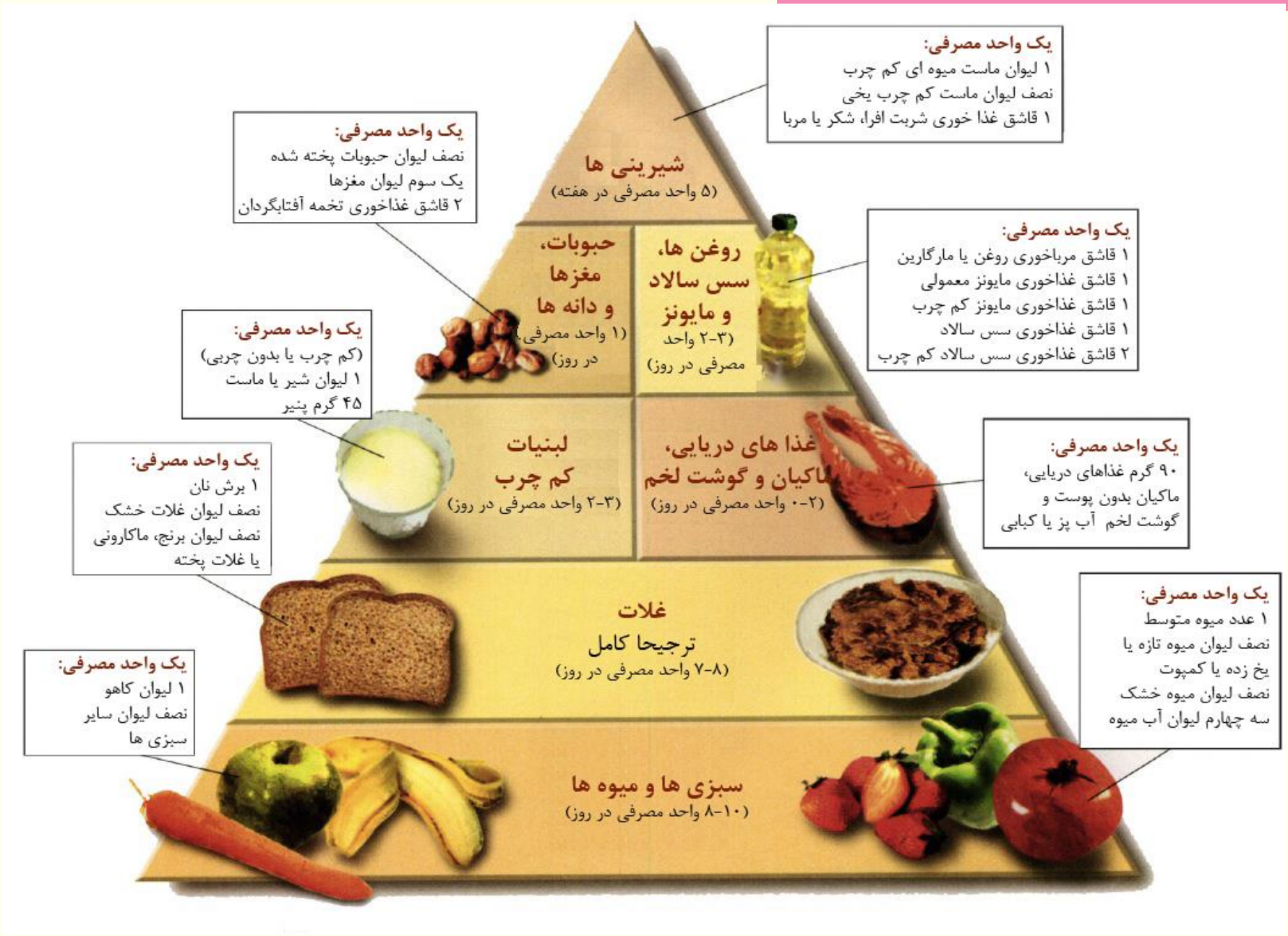
۵٪ کل انرژی از قند ساده:

۲۰۰۰× ۵٪= ۱۰۰کالری

۴ / ۱۰۰= ۲۵ گرم

۵ / ۲۵= ۵ واحد قند ساده (قاشق مرباخوری ۵ گرمی)

Krause's Food & The Nutrition Care Process. 2012.


یک واحد مصرفی:
۱ لیوان ماست میوه ای کم چرب
نصف لیوان ماست کم چرب یخی
۱ قاشق غذا خوری شربت افرا، شکر یا مربا
شیرینی ها
(۵ واحد مصرفی در هفته)
یک واحد مصرفی:
نصف لیوان حبوبات پخته شده
یک سوم لیوان مغزها
۲ قاشق غذاخوری تخمه آفتابگردان
حبوبات، مغزها و دانه ها
(۱ واحد مصرفی در روز)
روغن ها، سس سالاد و مایونز
(۳-۲ واحد مصرفی در روز)
یک واحد مصرفی:
۱ قاشق مرباخوری روغن یا مارگارین
۱ قاشق غذاخوری مایونز معمولی
۱ قاشق غذاخوری مایونز کم چرب
۱ قاشق غذاخوری سس سالاد
۲ قاشق غذاخوری سس سالاد کم چرب
یک واحد مصرفی:
(کم چرب یا بدون چربی)
۱ لیوان شیر یا ماست
۴۵ گرم پنیر
لبنیات کم چرب
(۳-۲ واحد مصرفی در روز)
غذا های دریایی، ماکیان و گوشت لخم
(۲-۰ واحد مصرفی در روز)
یک واحد مصرفی:
۹۰ گرم غذاهای دریایی،
ماکیان بدون پوست و
گوشت لخم آب پز یا کبابی
یک واحد مصرفی:
۱ برش نان
نصف لیوان غلات خشک
نصف لیوان برنج، ماکارونی
یا غلات پخته
غلات ترجیحا کامل
(۸-۷ واحد مصرفی در روز)
یک واحد مصرفی:
۱ عدد میوه متوسط
نصف لیوان میوه تازه یا
یخ زده یا کمپوت
نصف لیوان میوه خشک
سه چهارم لیوان آب میوه
یک واحد مصرفی:
۱ لیوان کاهو
نصف لیوان سایر
سبزی ها
سبزی ها و میوه ها
(۱۰-۸ واحد مصرفی در روز)

هرم راهنمای غذایی ایرانی

http://www.fao.org/nutrition/education/food-based-dietary-guidelines/regions/countries/iran/en/

Assessment

جدول تلفیق واحدهای توصیه شده دریافتی (serving size) با واحدهای سیاهه جانشینی

	تعداد واحد توصیه شده به علی	CHO (g)	Pro (g)	Fat (g)	Energy (Kcal)
Low fat dairy	3	3×12=36	3×8 =24	3×5 = 15	3×120 =360
Vegetables	5	5×5 =25	5×2 =10	-	5×25=125
Fruits	4	4×15 =60	-	-	4×60 =120
Simple sugar	5	5×5=25	-	-	5×20=100
Legumes	1	1×15=15	1×10=10	1×2=2	1×125=125
Grains	6	250 –161= 89÷15= 6	6×3 =18	-	6×80 =480
Meat	4 { 2 2	-	90-62= 28÷7=4	2×3=6 2×5=10	2×45=90 2×75=150
Fat and oil	7.5	-	-	71-33= 38÷5 = 7.5	7.5×45=337.5
Total		260	67	90	1917

Carbohydrate counting *(cont'd)*

	Meal/Snack/Time										
Food Group	Breakfast 7:30 AM	Snack 10:00	Lunch 12:00	Snack 3:00	Dinner 6:30	Snack 10:00	Total servings/ day	CHO (g)	Protein (g)	Fat (g)	Calories
Starches	2	1	2–3	1	2–3	1–2	10	15 150	3 30	1 10	80
Fruit	1		1		1	0–1	3	15 45			60
Milk	1				1		2	12 24	8 16	1 2	100
Vegetables			✓		✓			5 10	2 4		25
Meats/ Substitutes	15 %	10 %	25 %	10 %	30 %	10 %	6		7 42	5(3) 30	75(55)
Fats							5			5 25	45
CHO Choices	3–4 CHO	1 CHO	3–4 CHO	1 CHO	4–5 CHO	1–2 CHO	Total grams	229	92	67	
	23	6-8	23	6-8	30	8-12	Calories/ gram	X4= 916	X4= 368	X9= 603	Total calories 1900–2000
							rcent calories	50	19	30	

65 g fat-30%

Calculations are based on medium-fat meats and skim/very low-fat milk. If diet consists predominantly of low-fat meats, use the factor 3 g, instead of 5 g fat; if predominantly high-fat meats, use 8 g fat. If low-fat (2%) milk is used, use 5 g fat; if whole milk is used, use 8 g fat.

Krause's Food & The Nutrition Care Process. 2017

Assessment

با توجه به تزریق انسولین به علی، توزیع کربوهیدرات در وعده های غذایی به شکل ذیل محاسبه می شود:

250 ×15% = 37.5 g صبحانه

250× 10% = 25 g نیم چاشت

250× 25% = 62.5 g ناهار

250× 10% = 25 g عصرانه

250× 30% = 75 g شام

250× 10% = 25 g قبل خواب

260 g

d. Nutrition therapy (macronutrient, ***carbohydrate***) *(cont'd)*

S1= نیم چاشت **B=** صبحانه **L=** ناهار

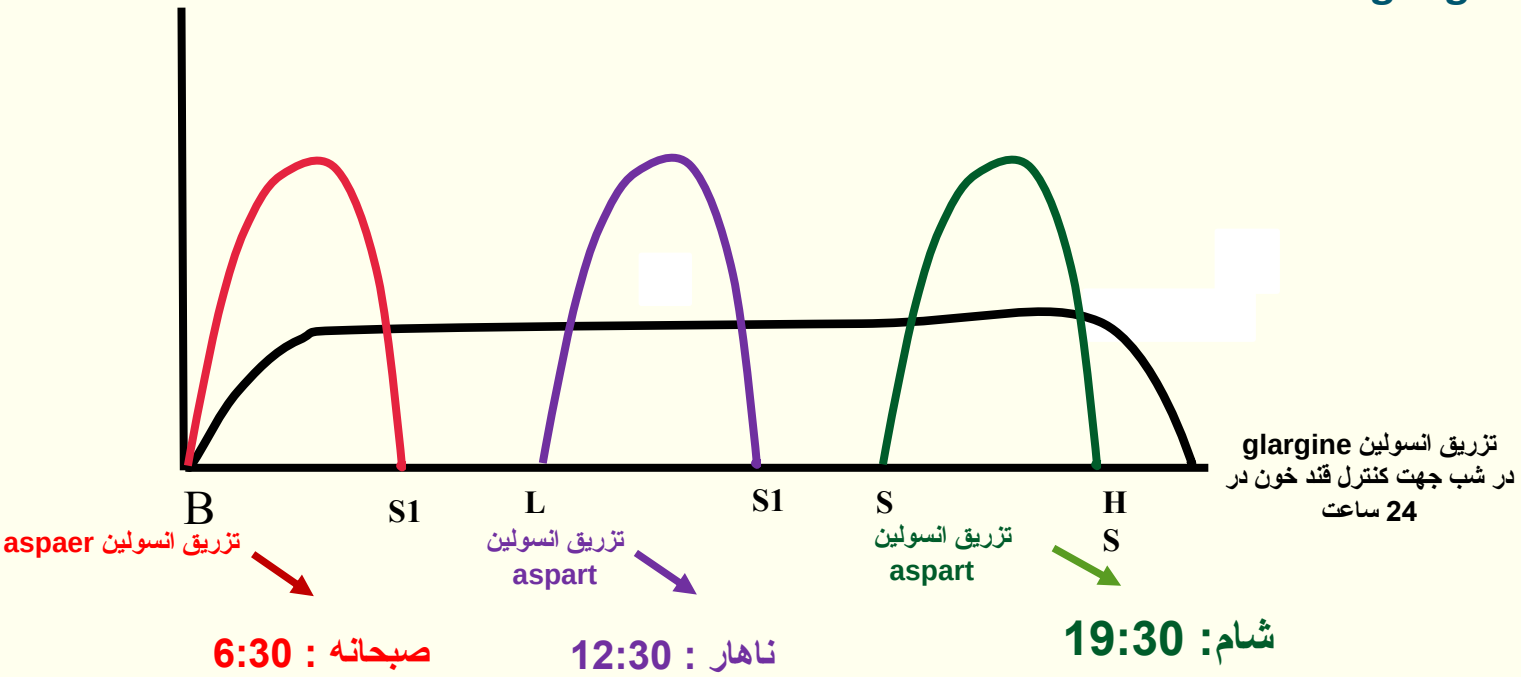
S= شام **HS=** میان وعده

S2= عصرانه قبل از خواب

یک نمونه برنامه تزریق انسولین :

کوتاه اثر: aspart

طولانی اثر: glargin



Assessment

توزیع عادلانه واحدهای توصیه شده دریافتی در وعده ها و میان وعده ها علی ط.

گروههای غذایی	تعداد واحد توصیه شده	صبحانه	نیم چاشت	نهار	عصرانه	شام	قبل از خواب
لبنیات کم چرب	3		1	1		1	
سبزی	5			3		2	
میوه	4		1		2		1
غلات	6	2		2		1/5	0/5
حبوبات	1					1	
قند ساده	5	2		1		1	1
گوشت	4 (2 2)	1		2			1
چربی	7	1		3	1	2	
شمارش کربوهیدرات (گرم)		40	27	64	30	77	27
شمارش کربوهیدارت استاندارد (گرم)	260	37.5	25	62.5	25	75	25

Planning

نمونه ای از یک برنامه غذایی سالم برای علی:

تزریق انسولین ساعت ۶

صبحانه : (ساعت ۶:۳۰)

نان سنگک ۲ کف دست، یک قوطی کبریت پنیر کم چرب و کم نمک
مغز گردو ۲ عدد، چای کمرنگ ۱ لیوان + ۲ قاشق مرباخوری عسل

میان وعده صبح:(ساعت ۱۰)

یک لیوان شیر کم چرب(۱/۵٪چربی)، دو عدد نارنگی

ناهار :(ساعت ۱۲:۳۰)

برنج – ۱۲ قاشق غذاخوری سر صاف
خورش کرفس (گوشت خورشتی دو قوطی کبریت، نصف لیوان کرفس پخته شده)
یک لیوان کاهوی و کلم خردشده به همراه نصف عدد گوجه فرنگی و نصف عدد خیار + ۱ قاشق مرباخوری روغن زیتون
یک لیوان ماست کم چرب و پروبیوتیک (۱/۵ درصد چربی)
روغن کلزا – ۲ ق م
ژله : یک قاشق غذاخوری

Planning

ادامه نمونه ای از یک برنامه غذایی سالم برای علی:

عصرانه :(ساعت ۴)

یک عدد انار متوسط+ یک عدد سیب
یک قاشق مرباخوری مغز خام تخمه کدو

تزریق انسولین ۶ شب

شام : (ساعت ۶:۳۰)

سه چهارم لیوان خوراک لوبیای چیتی
نان سنگک سنتی سبوس دار – ۱/۵ کف دست
ماست کم چرب پروبیوتیک – یک لیوان
سبزی خوردن: ۲ لیوان
۲ قاشق مربا خوری روغن زیتون
ژله یک قاشق غذاخوری

قبل از خواب : (ساعت ۱۰ شب)

یک عدد سیب
نصف کف دست نان سنگک، یک عدد تخم مرغ، یک قاشق مرباخوری ژله

Planning

توصیه های غذایی برای آقای علی ط

- از سبزیجات برگ سبز مانند کاهو، کلم، سبزی خوردن در برنامه غذایی استفاده نمایید.
- حداقل یک واحد مصرفی از کل میوه ها در برنامه غذایی شما از مرکبات و انواع توت ها باشد.
- نیمی از غلات دریافتی خود را از غلات کامل و سبوس دار مانند نان سنگگ تهیه نمایید.
- از حبوبات و مغزها و دانه ها، یک تا دو واحد، روزانه در برنامه غذایی خود استفاده نمایید.
- از مصرف نوشابه ها و آب میوه های صنعتی و سایر محصولات دارای افزودنی های شیرین کننده پرهیز نمایید.
- از مصرف روغن های هیدروژنه در برنامه غذایی پرهیز نمایید یا مصرف آن را به حداقل برسانید.
- از روغن زیتون، کانولا و گلزا و کنجد در برنامه غذایی جهت پخت و پز و سالاد استفاده نمایید.

Diabetes care,2018: 40 (S1):S33-43

Planning

توصیه های غذایی برای آقای علی ط

- مصرف نمک را محدود نمایید. میزان مصرف مجاز نمک برای شما یک قاشق مرباخوری در روز می باشد.
- از نمک در سفره استفاده ننمایید و از سایر طعم دهنده ها مانند آبلیمو و آبغوره برای طعم دار کردن غذا استفاده نمایید.
- هشت لیوان مایعات در روز بنوشید.
- وزن خود را با استفاده از فعالیت بدنی منظم (۳۰ تا ۴۵ دقیقه فعالیت بدنی منظم روزانه) و برنامه رژیم غذایی سالم کاهش دهید.

Diabetes care,2018: 40 (S1):S33-43

Dietary Inflammatory Index (DII) *cont'd*

2. EAT A LOW GLYCEMIC DIET

	GI	GL
Vegetables		
Beets, canned	64	5
Carrots (avg)	47	3
Parsnip	97	12
Peas (green, avg)	48	3
Potato		
Baked (avg)	85	26
Boiled	88	16
French fries	75	22
Microwaved	82	27
Pumpkin	75	3
Sweet corn	60	11
Sweet potato (avg)	61	17
Rutabaga	72	7
Yam (avg)	37	13

Dietary Inflammatory Index (DII) *cont'd*

2. EAT A LOW GLYCEMIC DIET

Legumes		
Baked beans (avg)	48	7
Broad beans	79	9
Butter beans	31	6
Chickpeas (avg)	28	8
Cannellini beans (avg)	38	12
Kidney beans (avg)	28	7
Lentils (avg)	29	5
Soy beans (avg)	18	1

Dietary Inflammatory Index (DII) *cont'd*

2. EAT A LOW GLYCEMIC DIET

Fruit		
Apple (avg)	38	6
Apricot (dried)	31	9
Banana (avg)	51	13
Cherries	22	3
Grapefruit	25	3
Grapes (avg)	46	8
Kiwi fruit (avg)	53	6
Mango	51	8
Orange (avg)	48	5
Papaya	59	10
Peach (avg)		
Canned (natural juice)	38	4
Fresh (avg)	42	5
Pear (avg)	38	4
Pineapple	59	7
Plum	39	5
Raisins	64	28
Cantaloupe	65	4
Watermelon	72	4

Dietary Inflammatory Index (DII) *cont'd*

3. Have nuts and seeds or nut and seed butter every day

Nuts and seeds:

- ✓ Provide anti-inflammatory and valuable phenolic compounds
- ✓ A beneficial ratio of polyunsaturated fats (omega-6 and omega-3)
- ✓ To gain the spectrum of nutrients that each has to offer

⇓

support a healthy inflammatory response in the body

Especially beneficial:

Pumpkin seeds, sunflower seeds, almonds, cashews, Brazil nuts, flaxseed, sesame seeds, and walnuts

Dietary Inflammatory Index (DII) *cont'd*

5. GET ADEQUATE SOURCES OF PROBIOTICS

Pre-biotics: feed the good bacteria

- ✓ Inulin and fructooligosaccharides
- ✓ Sources: bananas, asparagus, onions, garlic, chicory, artichoke

Glycemic Monitoring, Insulin Delivery, and Targets in T1DM

Monitor glucose levels multiple times daily (up to 6–10 times/day:

- Prior to meals and snacks
- At bedtime
- As needed for safety in specific situations such as physical activity, driving, or the presence of symptoms of hypoglycemia

- A strong relationship exists between the frequency of blood glucose monitoring and glycemic management

جدول بررسی وضعیت قند خون در طول روز

	شنبه	1 شنبه	2 شنبه	3 شنبه	4 شنبه	5 شنبه	جمعه
قبل از صبحانه	*		*			*	
بعد از صبحانه		*		*			*
ساعت 10 و نیم			*		*		*
قبل از ناهار		*		*		*	
بعد از ناهار	*		*			*	
عصر		*		*			*
قبل از شام	*			*		*	
بعد از شام			*		*		*
هنگام خواب	*			*	*		*

Monitoring in Type 1 diabetes

Therapy is being modified or who are not meeting the goal

check HbA1c every 3 months

https://bestpractice.bmj.com/topics/en-us/25/monitoring

Monitoring in Type 1 diabetes

Meeting treatment goal:

≤ 18 years: **< 7.5%**

Adults: **< 7%**

↓

check HbA1c: twice yearly

https://bestpractice.bmj.com/topics/en-us/25/monitoring

Monitoring in Type 1 diabetes

Very old patients

Very young patients

History of severe hypoglycemia

Limited lifespan

↓

the HbA1c goal can be less stringen

https://bestpractice.bmj.com/topics/en-us/25/monitoring

با تشکر از توجه شما

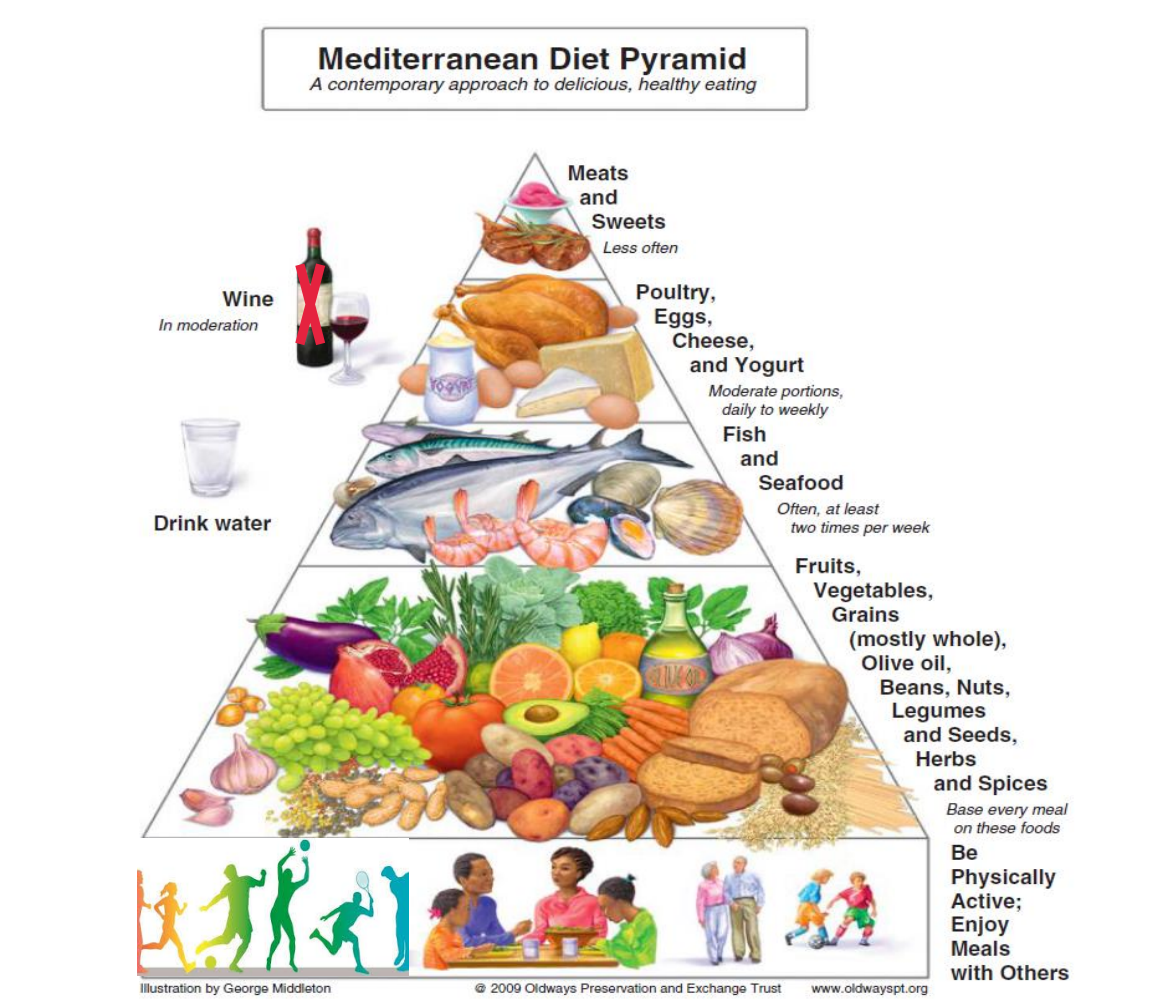
Component of MNT: *(cont'd)*

d. Nutrition therapy (dietary pattten) *(cont'd)*

Mediterranean style eating pattern

- Rich in MUFA & PUFA
- Consumption of long chain n-3 FA
  - Fatty fish
  - Nuts and seeds
- Not consumption of n-3 dietary supplement

- ADA. Facilitating behavior change and well-being to improve health outcomes: standards of medical care in diabetes. Diabetes care; 2020; 43 (s1): 32-35



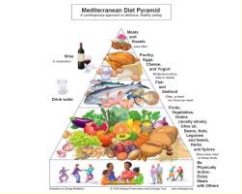
- Krause's food & nutrition care process,14th edition; 2017, p 657-9

Component of MNT: *(cont'd)*

d. Nutrition therapy (dietary patterns)

Feature of Mediterranean diet:

- Enjoying meals with family and friends
- Getting plenty of exercise



- Krause's food & nutrition care process,14th edition; 2017, p 657-9

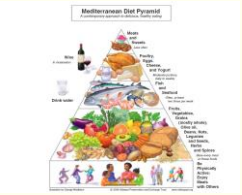
Component of MNT: *(cont'd)*

d. Nutrition therapy (dietary patterns)

Feature of Mediterranean diet *(cont'd)*:

a. Fruit and vegetables

- An abundance and variety of plant foods should make up the majority of your meals
- Strive for **7 to 10 servings** a day of veggies and fruits
- Greater number of servings of fruits and vegetables (mostly fresh) with an emphasis on **root vegetables and greens vegetables**
- Using herbs and spices instead of **salt** to flavor foods



- Krause's food & nutrition care process,14th edition; 2017, p 657-9

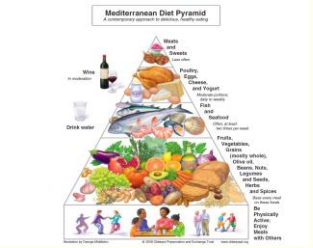
Component of MNT: *(cont'd)*

d. Nutrition therapy (dietary patterns)

Feature of Mediterranean diet *(cont'd)*:

b. Grains :

- Are typically whole grain
- **Bread** is an important part of the diet
  - (Usually contain very few unhealthy trans fats)



- Krause's food & nutrition care process,14th edition; 2017, p 657-9

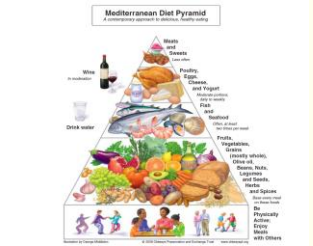
Component of MNT: *(cont'd)*

d. Nutrition therapy (dietary patterns)

Features of the diet *(cont'd)*:

c. FAT and OILS

- Moderate in **total fat** (**32% to 35%)**
  - High in PUFA (especially omega-3)
  - High levels of MUFA such as olive oil
  - Use of canola oil, olive oil, nut oil
  - Relatively low in saturated fat (9% to 10%)



- Krause's food & nutrition care process,14th edition; 2017, p 657-9

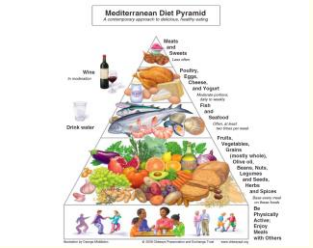
Component of MNT: *(cont'd)*

d. Nutrition therapy (dietary patterns)

Features of the diet *(cont'd)*:

c. FAT and OILS (cont'd)

- **Olive** or **canola** oil as a healthy replacement for butter or margarine
- Try **tahini** as a dip or spread
- The **type of fats consumed** is more important than total amount of fat (looking at metabolic goals and CVD risk)
- Mediterranean-style diet: effective alternative to a diet low in total fat and high in carbohydr



- Krause's food & nutrition care process,14th edition; 2017, p 657-9

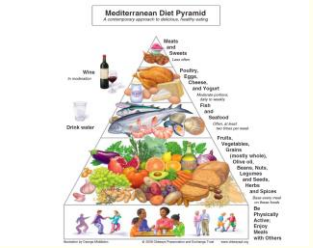
Component of MNT: *(cont'd)*

d. Nutrition therapy (dietary patterns)

Features of the diet *(cont'd)*:

d. Nuts and seed:

- high in fat : 80% from fat
- high in calories: should not be eaten in large amounts
- **Avoid** *candied* or *honey-roasted* and *salted* nuts



- Krause's food & nutrition care process,14th edition; 2017, p 657-9

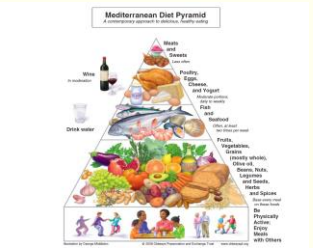
Component of MNT: *(cont'd)*

d. Nutrition therapy (dietary patterns)

Features of the diet *(cont'd)*:

d. Beans and legumes:

- high in soluble fiber and low GI
- 1 serving/ day



-Krause's food & nutrition care process,14th edition; 2017, p 657-9

Food groups and intermediate disease markers: a systematic review and network meta-analysis of randomized trials

Lukas Schwingshackl,[1,2] *Georg Hoffmann,*[3] *Khalid Iqbal,*[1] *Carolina Schwedhelm,*[1,2] *and Heiner Boeing*[1,2]

[1]Department of Epidemiology, German Institute of Human Nutrition Potsdam-Rehbruecke (DIfE), Nuthetal, Germany; [2]NutriAct – Competence Cluster Nutrition Research Berlin-Potsdam, Germany; and [3]Department of Nutritional Sciences, University of Vienna, Vienna, Austria

Results: A total of 66 randomized trials (86 reports) comparing 10 food groups and enrolling 3595 participants was identified. Nuts were ranked as the best food group at reducing LDL cholesterol (SUCRA: 93%), followed by legumes (85%) and whole grains (70%). For reducing TG, fish (97%) was ranked best, followed by nuts (78%) and red meat (72%). However, these findings are limited by the low quality of the evidence. When combining all 10 outcomes, the highest SUCRA values were found for nuts (66%), legumes (62%), and whole grains (62%), whereas SSBs performed worst (29%).

Conclusion: The present NMA provides evidence that increased intake of nuts, legumes, and whole grains is more effective at improving metabolic health than other food groups. For the credibility of diet-disease relations, high-quality randomized trials focusing on well-established intermediate-disease markers could play an important role. This systematic review was registered at PROSPERO (www.crd.york.ac.uk/PROSPERO) as CRD42018086753. *Am J Clin Nutr* 2018;108:576–586.

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Taylor & Francis
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REVIEW

Benefits of pulse consumption on metabolism and health: A systematic review of randomized controlled trials

Helena Ferreira[a], Marta Vasconcelos[a], Ana M. Gil[b], and Elisabete Pinto[a,c]

[a]CBQF - Centro de Biotecnologia e Química Fina – Laboratório Associado, Escola Superior de Biotecnologia, Universidade Católica Portuguesa, Porto, Portugal; [b]Department of Chemistry and, CICECO-Aveiro Institute of Materials, University of Aveiro, Aveiro, Portugal; [c]EPIUnit - Instituto de Saúde Pública, Universidade do Porto, Porto, Portugal

ABSTRACT

Pulses are nutrient-dense foods that have for a long time been empirically known to have beneficial effects in human health. In the last decade, several studies have gathered evidence of the metabolic benefits of pulse intake. However, it remains unclear at what amounts these effects may be attained. This study aimed to systematically review the scientific outputs of the last two decades regarding health benefits of pulse consumption and the amounts necessary for positive outcomes to be achieved. A PubMed search including keywords [("dietary pulses", "pulses", "legumes", "grain legumes", "bean", "chickpea", "pea", "lentil", "cowpea", "faba bean", "lupin") and ("inflammation", "inflammatory markers", "C-reactive protein", "blood lipids", "cholesterol", "cardiometabolic health", "cardiovascular disease", "diabetes", "glycaemia", "insulin", "HOMA-IR", "body weight", "body fat", "obesity", "overweight", "metabolome", "metabolic profile", "metabolomics", "biomarkers", "microbiome", "microbiota", "gut")] was performed. Only English written papers referring to human dietary interventions, longer than one day, focusing on whole pulses intake, were included. Most of the twenty eligible publications reported improvements in blood lipid profile, blood pressure, inflammation biomarkers, as well as, in body composition, resulting from pulse daily amounts of 150 g (minimum-maximum: 54-360 g/day; cooked). Concerns regarding methodological approaches are evident and the biochemical mechanisms underlying such effects require further investigation.

KEYWORDS

Biomarkers; cardiovascular risk factors; ingestion; legume grains; well-being

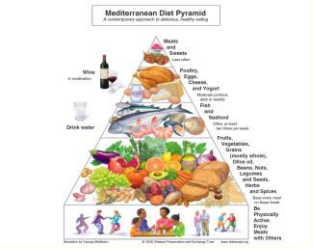
Component of MNT: *(cont'd)*

d. Nutrition therapy (dietary patterns)

Features of the diet *(cont'd)*:

e. Herbs and spices:

- Using **herbs and spices** instead of **salt** to flavor foods and meals
- Herbs and spices make ***food tasty*** and are also rich in ***health-promoting substances*.**



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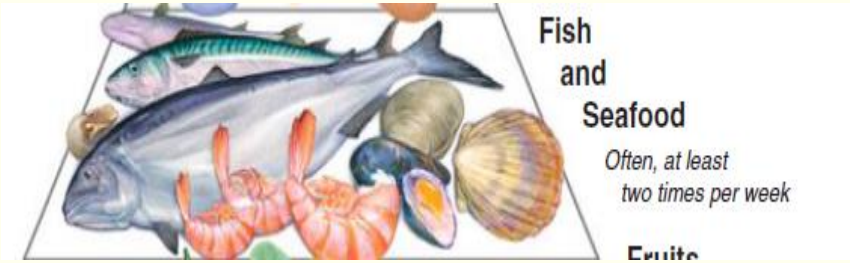
Component of MNT: *(cont'd)*

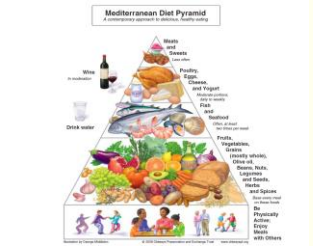
d. Nutrition therapy (dietary patterns)



Features of the diet *(cont'd)*:

e. Fish and seafood:

- Fatty fish- such as salmon
- Rich sources of omega-3 fatty acids
- Fish is eaten on a regular basis (once or twice a week)
- Avoid fried fish



-Krause's food & nutrition care process,14th edition; 2017, p 657-9

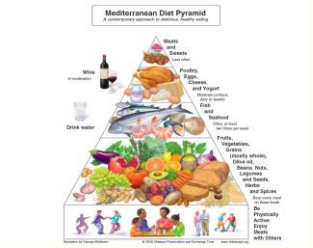
Component of MNT: *(cont'd)*

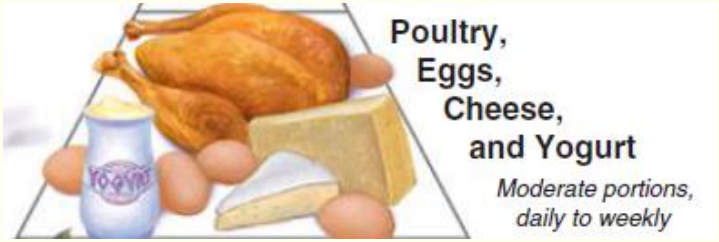
d. Nutrition therapy (dietary patterns)

Features of the diet *(cont'd)*:

f. Dairy products:

- Limit higher fat dairy products (whole or 2 percent milk, cheese and ice cream)
- Switch to skim milk, fat-free yogurt and low-fat cheese





- Krause's food & nutrition care process,14th edition; 2017, p 657-9

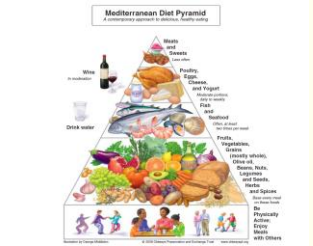
Component of MNT: *(cont'd)*

d. Nutrition therapy (dietary patterns)

Features of the diet *(cont'd)*:

g. MEAT:

- Substitute **fish and poultry** for **red meat**
- When eaten, make sure it's **lean** and keep portions small
- Also avoid **sausage**, and other **high-fat meats**



- Krause's food & nutrition care process,14th edition; 2017, p 657-9

Component of MNT: *(cont'd)*

d. Nutrition therapy (dietary patten)

Dietary pattern recommended to diabetes:

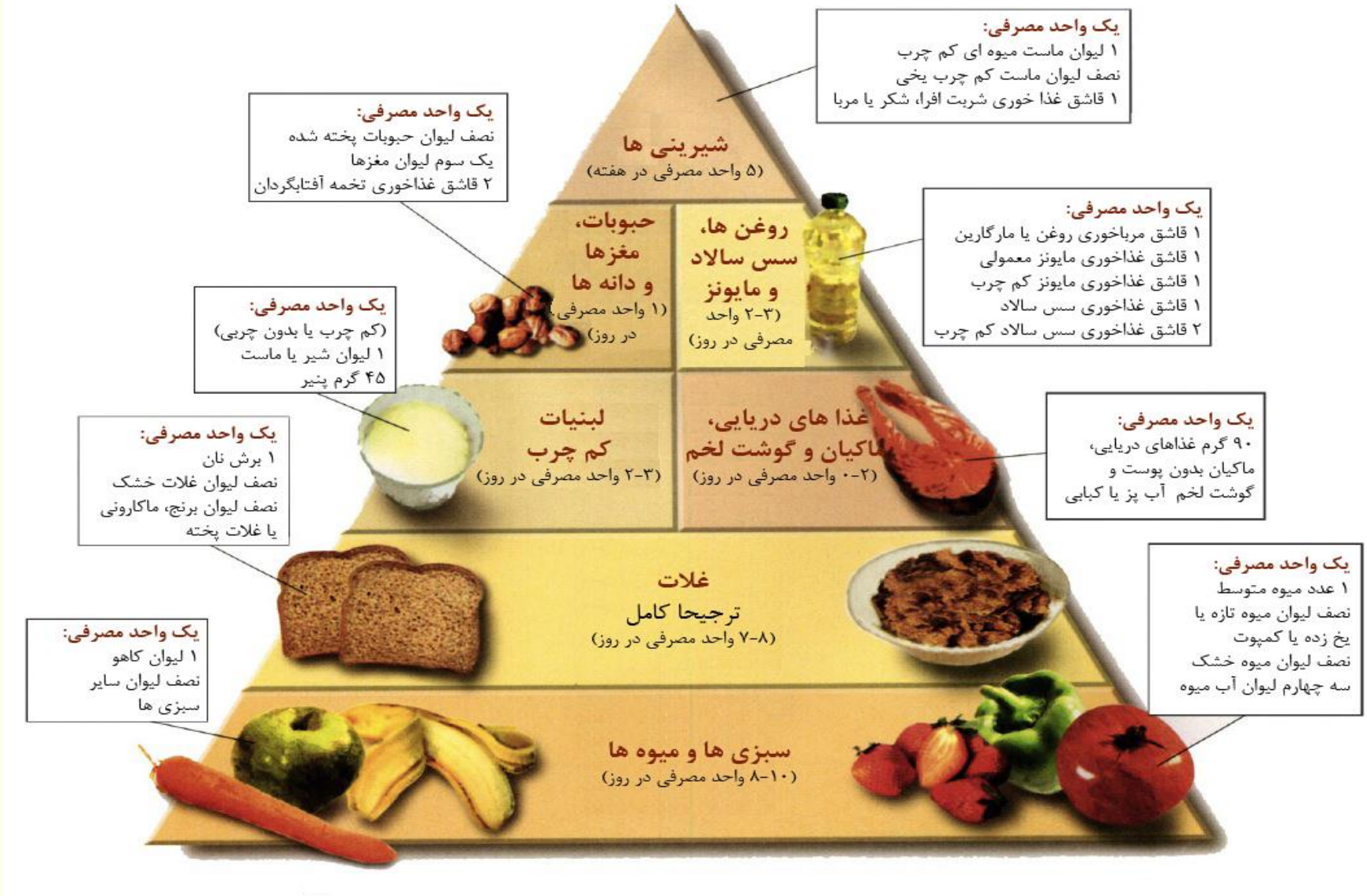
- Mediterranean diet:

  as being low in saturated fat and high in vegetable oils, observed in Greece and Southern Italy during the 1960s

- DASH diet (dietary approach to stop hypertension) :

  a lifelong approach to healthy eating that's designed to help treat or prevent high blood pressure

- Khanji et al. Int J Cardiol.2018 ;263:142-151.
- Papamichou D et al. Nutr Metab Cardiovasc Dis 2019 Jun;29(6):531-543
- ADA. Facilitating behavior change and well-being to improve health outcomes: standards of medical care in diabetes. Diabetes care; 2020; 43 (s1): 32-35


یک واحد مصرفی:
۱ لیوان ماست میوه ای کم چرب
نصف لیوان ماست کم چرب یخی
۱ قاشق غذا خوری شربت افرا، شکر یا مربا
شیرینی ها
(۵ واحد مصرفی در هفته)
یک واحد مصرفی:
نصف لیوان حبوبات پخته شده
یک سوم لیوان مغزها
۲ قاشق غذاخوری تخمه آفتابگردان
حبوبات، مغزها و دانه ها
(۱ واحد مصرفی در روز)
روغن ها، سس سالاد و مایونز
(۳-۲ واحد مصرفی در روز)
یک واحد مصرفی:
۱ قاشق مرباخوری روغن یا مارگارین
۱ قاشق غذاخوری مایونز معمولی
۱ قاشق غذاخوری مایونز کم چرب
۱ قاشق غذاخوری سس سالاد
۲ قاشق غذاخوری سس سالاد کم چرب
یک واحد مصرفی:
(کم چرب یا بدون چربی)
۱ لیوان شیر یا ماست
۴۵ گرم پنیر
لبنیات کم چرب
(۳-۲ واحد مصرفی در روز)
غذا های دریایی، ماکیان و گوشت لخم
(۲-۰ واحد مصرفی در روز)
یک واحد مصرفی:
۹۰ گرم غذاهای دریایی، ماکیان بدون پوست و گوشت لخم آب پز یا کبابی
یک واحد مصرفی:
۱ برش نان
نصف لیوان غلات خشک
نصف لیوان برنج، ماکارونی یا غلات پخته
غلات ترجیحا کامل
(۸-۷ واحد مصرفی در روز)
یک واحد مصرفی:
۱ عدد میوه متوسط
نصف لیوان میوه تازه یا یخ زده یا کمپوت
نصف لیوان میوه خشک
سه چهارم لیوان آب میوه
یک واحد مصرفی:
۱ لیوان کاهو
نصف لیوان سایر سبزی ها
سبزی ها و میوه ها
(۱۰-۸ واحد مصرفی در روز)

Dietary inflammatory index

Dietary Inflammatory Index (DII)

- As a tool to evaluate the overall inflammatory potential of the diet
- The DII consists of 45 foods, spices, nutrients and bioactive compounds in relation to six inflammatory biomarkers IL-1b, IL-4, IL-6, IL-10, TNF-a and C-reactive protein

Dietary Inflammatory Index (DII) *cont'd*

Components of DII:

1. Consume an abundant of fruit, vegetables, herbs and spices
2. Eat a low glycemic diet
3. Have nuts and seeds or nut and seed butter every day
4. Adjusted the quality and quantity of dietary fat and oils
5. Get adequate sources of probiotics
6. Consider food allergy or sensitivity
7. Avoids chemicals
8. Stress and sleep

Dietary Inflammatory Index (DII) *cont'd*

1. Consume an abundant of fruit, vegetables, herbs and spices

   ✓ Colorful fruits and vegetables contain a myriad of anti-inflammatory phytochemicals and fiber and are thought to be the cornerstone of an anti-inflammatory diet due to their ability to down-regulate markers such as CRP, NFkB, histamine and other inflammatory cytokines in vivo and in vitro.

Dietary Inflammatory Index (DII) *cont'd*

1. Consume an abundant of fruit, vegetables, herbs and spices

   ➢ The most anti-inflammatory fruit and vegetables:

Cruciferous vegetables, onions, berries, purple grapes, cherries, citrus fruits, tomatoes, and pomegranates








Dietary Inflammatory Index (DII) *cont'd*

1. Consume an abundant of fruit, vegetables, herbs and spices
   - The most anti-inflammatory fruit and vegetables:

rosemary, oregano, mint, coriander, parsley, sage, dill, Bay leaf, and basil.

Dietary Inflammatory Index (DII) *cont'd*

1. Consume an abundant of fruit, vegetables, herbs and spices

   - The most anti-inflammatory herbs and spices:

     green and black tea, turmeric, ginger, garlic, caraway, anise, cocoa, clove, coriander, cinnamon, nutmeg, red chili powder, lemongrass, fennel, saffron, black pepper, parsley.

Dietary Inflammatory Index (DII) *cont'd*

Components of DII:

1. Consume an abundant of fruit, vegetables, herbs and spices
2. Eat a low glycemic diet
3. Have nuts and seeds or nut and seed butter every day
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6. Consider food allergy or sensitivity
7. Avoids chemicals
8. Stress and sleep

Dietary Inflammatory Index (DII) *cont'd*

2. Eat low glycemic diet

Excessive amounts of refined carbohydrates and sugars:

- ✓ May be pro-inflammatory.
- ✓ Can increase blood glucose and insulin levels which, when chronically elevated
- ✓ Can trigger an inflammatory response.

It's important to look at the glycemic load of a food versus the glycemic index because the load is a better indicator of the actual portion of food.

Dietary Inflammatory Index (DII) *cont'd*

2. EAT A LOW GLYCEMIC DIET

	GI	GL
Vegetables		
Beets, canned	64	5
Carrots (avg)	47	3
Parsnip	97	12
Peas (green, avg)	48	3
Potato		
Baked (avg)	85	26
Boiled	88	16
French fries	75	22
Microwaved	82	27
Pumpkin	75	3
Sweet corn	60	11
Sweet potato (avg)	61	17
Rutabaga	72	7
Yam (avg)	37	13

Dietary Inflammatory Index (DII) *cont'd*

2. EAT A LOW GLYCEMIC DIET

Legumes		
Baked beans (avg)	48	7
Broad beans	79	9
Butter beans	31	6
Chickpeas (avg)	28	8
Cannellini beans (avg)	38	12
Kidney beans (avg)	28	7
Lentils (avg)	29	5
Soy beans (avg)	18	1

Dietary Inflammatory Index (DII) *cont'd*

2. EAT A LOW GLYCEMIC DIET

Fruit		
Apple (avg)	38	6
Apricot (dried)	31	9
Banana (avg)	51	13
Cherries	22	3
Grapefruit	25	3
Grapes (avg)	46	8
Kiwi fruit (avg)	53	6
Mango	51	8
Orange (avg)	48	5
Papaya	59	10
Peach (avg)		
Canned (natural juice)	38	4
Fresh (avg)	42	5
Pear (avg)	38	4
Pineapple	59	7
Plum	39	5
Raisins	64	28
Cantaloupe	65	4
Watermelon	72	4

Dietary Inflammatory Index (DII) *cont'd*

2. EAT A LOW GLYCEMIC DIET

High Glycemic Foods	Low Glycemic Foods
Cookies, cakes, pastries*, chips, white flour breads, crackers, tortillas, pasta, white rice	Whole and unprocessed grains, (like oats, brown rice, quinoa, whole wheat) high fiber or whole grain pastas
Large amounts of fruit juice and dried fruits	Fresh fruit
White (russet potatoes) mashed or baked without the skin	Sweet potatoes, pumpkin, squashes, beans and lentils, nuts and seeds
Sugar-sweetened sodas and other beverages	Most vegetables**

*cookies, cakes etc, can be made using low glycemic ingredients like oats and nuts which can reduce their glycemic load

**Consuming large amounts of certain juiced vegetables like carrots or beets will produce a higher glycemic load.

Dietary Inflammatory Index (DII) *cont'd*

Components of DII:

1. Consume an abundant of fruit, vegetables, herbs and spices
2. Eat a low glycemic diet
3. Have nuts and seeds or nut and seed butter every day
4. Adjusted the quality and quantity of dietary fat and oils
5. Get adequate sources of probiotics
6. Consider food allergy or sensitivity
7. Avoids chemicals
8. Stress and sleep

Dietary Inflammatory Index (DII) *cont'd*

3. Have nuts and seeds or nut and seed butter every day

Nuts and seeds:

- ✓ Provide anti-inflammatory and valuable phenolic compounds
- ✓ A beneficial ratio of polyunsaturated fats (omega-6 and omega-3)
- ✓ To gain the spectrum of nutrients that each has to offer

⇓

support a healthy inflammatory response in the body

Especially beneficial:

Pumpkin seeds, sunflower seeds, almonds, cashews, Brazil nuts, flaxseed, sesame seeds, and walnuts

Dietary Inflammatory Index (DII) *cont'd*

Components of DII:

1. Consume an abundant of fruit, vegetables, herbs and spices
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Dietary Inflammatory Index (DII) *cont'd*

4. ADJUST THE QUALITY AND QUANTITY OF DIETARY FAT AND OILS

Increase:

- Unsaturated fats high in omega-3 fatty acids (alphalinolenic acid) which are anti-inflammatory
- Best sources: cold water fish, flax, chia and hemp seeds, and walnuts
- Flaxseed and walnut oil are excellent plant sources of omega-3 fatty acids, and are great for salad dressings, but should not be heated.
- can be added to dips, smoothies and salads

Dietary Inflammatory Index (DII) *cont'd*

4. ADJUST THE QUALITY AND QUANTITY OF DIETARY FAT AND OILS

Increase:

- Canola is also a price-friendly option for obtaining more omega 3's in the diet, but is considered by some to be more processed.

- Monounsaturated fats: Use extra virgin olive oil as the main ingredient for sauces, salad dressings, and marinades.

- Avocados can replace cheese or mayonnaise on sandwiches, and can be added to dips, smoothies and salads

Dietary Inflammatory Index (DII) *cont'd*

4. ADJUST THE QUALITY AND QUANTITY OF DIETARY FAT AND OILS

Decrease:

- ✓ Animal protein: arachidonic acid, which can increase inflammation in excess

- ✓ Processed foods and oils: high in omega-6 fatty acids (linoleic acid):
  - ✓ soybean
  - ✓ Corn
  - ✓ Safflower
  - ✓ sunflower oils

Dietary Inflammatory Index (DII) *cont'd*

4. ADJUST THE QUALITY AND QUANTITY OF DIETARY FAT AND OILS

Decrease:

- ✓ Omega-6 fatty acids can increase pro-inflammatory markers in the body if eaten in excess. Many of these oils are widely used in processed foods

- ✓ Avoid hydrogenated fats and trans fats that are found in many baked and prepackaged foods and are in hydrogenated vegetable shortening and many margarines.

Dietary Inflammatory Index (DII) *cont'd*

Components of DII:

1. Consume an abundant of fruit, vegetables, herbs and spices
2. Eat a low glycemic diet
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8. Stress and sleep

Dietary Inflammatory Index (DII) *cont'd*

5. GET ADEQUATE SOURCES OF PROBIOTICS

Gut ecology:

- ✓ Digestive tract healthy
- ✓ Balance the immune system
- ✓ Reduce inflammation

Excellent source of probiotic bacteria:

- ✓ Fermented and cultured foods

Sources:

miso, sauerkraut, yogurt, kefir, and kimchi, tempeh and kombucha (a fermented beverage).

Dietary Inflammatory Index (DII) *cont'd*

5. GET ADEQUATE SOURCES OF PROBIOTICS

Pre-biotics: feed the good bacteria

- ✓ Inulin and fructooligosaccharides
- ✓ Sources: bananas, asparagus, onions, garlic, chicory, artichoke

Dietary Inflammatory Index (DII) *cont'd*

Components of DII:

1. Consume an abundant of fruit, vegetables, herbs and spices
2. Eat a low glycemic diet
3. Have nuts and seeds or nut and seed butter every day
4. Adjusted the quality and quantity of dietary fat and oils
5. Get adequate sources of probiotics
6. Consider food allergy or sensitivity
7. Avoids chemicals
8. Stress and sleep

Dietary Inflammatory Index (DII) *cont'd*

6. CONSIDER FOOD ALLERGY OR SENSITIVITY ELIMINATION

Food allergy: systemic immune mediated response

- ✓ A food intolerance or sensitivity: Enzyme deficiency or a reaction to a food additive or to naturally occurring chemicals in foods

- ✓ These adverse reactions to food can induce the production of a variety of inflammatory mediators including immunoglobulins, cytokines and histamine.

Dietary Inflammatory Index (DII) *cont'd*

6. CONSIDER FOOD ALLERGY OR SENSITIVITY ELIMINATION

The 8 common food allergens that must be listed on food labels: Milk, eggs, fish, wheat, tree nuts, peanuts, soybeans and shellfish

Common food intolerances:

- ✓ Non-celiac gluten, lactose, soy, histamine and salicylate intolerances

Common food additive intolerances:

- ✓ Sulfites, tartrazine (Yellow 5), benzoic acid, and monosodium glutamate (MSG)

Dietary Inflammatory Index (DII) *cont'd*

6. CONSIDER FOOD ALLERGY OR SENSITIVITY ELIMINATION

- ✓ Sensitive to a compound called "solanine" found in nightshade family of fruits and vegetables (eggplant, peppers, tomatoes, tomatillos, and potatoes

Dietary Inflammatory Index (DII) *cont'd*

Components of DII:

1. Consume an abundant of fruit, vegetables, herbs and spices
2. Eat a low glycemic diet
3. Have nuts and seeds or nut and seed butter every day
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5. Get adequate sources of probiotics
6. Consider food allergy or sensitivity
7. Avoids chemicals
8. Stress and sleep

Dietary Inflammatory Index (DII) *cont'd*

7. AVOID CHEMICALS

- ✓ Many industrial chemicals and pesticides can irritate or disrupt the immune system and cause inflammation
- ✓ Choose organic or low pesticide foods and "green" personal care and cleaning products to reduce exposure.
- ✓ Many canned foods contain bisphenol A in their linings.
- ✓ Bisphenol A (aka "BPA"), which is also found in many plastic bottles and food containers, is an endocrine disruptor, impairs the action of insulin in the body, and up-regulates inflammatory pathways.
- ✓ Seek out "BPA-Free" cans, and use glass containers and bottles as often as possible.

Dietary Inflammatory Index (DII) *cont'd*

Components of DII:

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8. Stress and sleep

Dietary Inflammatory Index (DII) *cont'd*

8. STRESS AND SLEEP

- ✓ High stress levels and lack of adequate sleep are both associated with inflammation.
- ✓ Elevated circulating cortisol levels found under conditions of psychological stress are associated with elevated inflammatory cytokines.
- ✓ Sustained sleep restriction has also been associated with an inflammatory state and an elevation of TNF- a, IL -1b, IL-2, IL-4 and monocyte chemo-attractant protein-1 (MCP-1).

- ✓ Intentionally practicing stress reduction techniques such as meditation has been shown to reduce the inflammatory response in human experimental models