Current Trends in Diabetes Medical Nutrition Therapy

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Diabetes & Nutrition Education
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Objectives

– Identify how a Mediterranean-style diet may improve glucose metabolism and reduce cardiovascular risk

– Identify how plate method can be utilized regarding clinical practice guidelines
Objectives

– Identify proposed change to the existing food label and its impact upon clinical practice guidelines
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• Eat a variety of foods
• Maintain ideal weight
• Avoid too much fat, saturated fat, and cholesterol
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• Eat foods with adequate starch and fiber

• Avoid too much sugar

• Avoid too much sodium

• If you drink alcohol, do so in moderation
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1980 Dietary Guidelines:

• Broad guidelines

• Did not address specific population groups
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1992 Food Pyramid

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1992 Food Guide Pyramid

• Intent was to simplify dietary guidelines while shifting emphasis of calories from saturated fats
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- Did not distinguish between sources of dietary fats
- Did not associate role of excessive intake of calories from refined carbohydrates with insulin response
Introduction of My Plate - June 2010

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2010 My Plate:

• Common reference point
• Could be used across various population groups
• Visually appealing
• Incorporation of clinical practice guidelines in an easy-to-use format
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2010 My Plate:

• Emphasis upon nutrient dense foods
• Compliments 2010 Dietary Guidelines
2015-2020 Dietary Guidelines for Americans

• Follow a healthy eating pattern across the lifespan. All food and beverage choices matter.

• Focus on variety, nutrient density, and amount.

• Limit calories from added sugars and saturated fats and reduce sodium intake.
2015-2020 Dietary Guidelines for Americans

- Shift to healthier food and beverage choices
- Support healthy eating patterns for everyone

*Note similarities to Dietary Guidelines and Mediterranean-style diet*
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What is the significance of the Mediterranean-style diet in its application of clinical guidelines for those with diabetes?
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A closer look at the Standards of Medical Care for those with Diabetes
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• Cardiovascular disease is the leading cause of morbidity and mortality in people with diabetes

Goal: to control individual cardiovascular risk factors in preventing or slowing cardiovascular disease in people with diabetes
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In the person with diabetes, cardiovascular disease and risk management includes:

• Blood pressure control
• Lipid management
• Antiplatelet agents
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Recommendations for lipid management

• Lifestyle modifications focusing upon
  – Weight loss (if indicated)
  – Reduction of saturated, *trans* fat and cholesterol
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– Increased intake of omega fatty acids, plant stanols/sterols as well as viscous fiber
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ABC’s of diabetes management:

- **A**-A1c
- **B**-Blood pressure
- **C**-Cholesterol

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American Diabetes Association Goals:

A- A1c- less than 7%
B- Blood pressure (<130/80)
C- Cholesterol (LDL < 100 mg/dl; < 70 mg/dl with diagnosed cardiovascular disease)
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Lifestyle changes to promote risk reduction include:

• Dietary modifications
• Physical activity
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Patient-centered dietary modifications to reduce ABC risk in persons with diabetes
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DASH (Dietary Approach to Stop Hypertension)

• Emphasis upon fruits and vegetables

• Includes some low fat dairy products
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DASH (Dietary Approach to Stop Hypertension)

• Emphasis upon reduced intake of sodium (<2.4 g/day)

• Use of alcohol in moderation (1-2 drinks/day for women/men, respectively)
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DASH (Dietary Approach to Stop Hypertension)

- Studies have demonstrated that following DASH-style lifestyle blood pressure reduction compares to one antihypertensive agent
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Therapeutic Lifestyle Changes (TLC)

- Provides guidelines for risk reduction of CHD
- Recognized diabetes as CHD risk-equivalent
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Therapeutic Lifestyle Changes (TLC)

- Emphasis upon on lipid management in treatment of diabetes
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Therapeutic Lifestyle Changes (TLC)

Characteristics include:

- Incorporates use of sterols/stanols (2 g/day)
- Soluble fiber recommendations (10-25 g/day)
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Therapeutic Lifestyle Changes (TLC)

- **Advantage**
  - Specific guidelines

- **Disadvantage**
  - Requires personalized calorie goals
  - Precise recall data collection by patient
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Challenge:

Addressing ABC’s associated with morbidity/mortality of persons with diabetes that:

• Can be explained in simple terms
• Does not require high skill level by patient
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**Solution:**

Mediterranean-style diet which incorporates elements from:

- DASH
- TLC diet

Therefore addressing the ABC’s of medical nutrition therapy in people with diabetes
<table>
<thead>
<tr>
<th>Eating Pattern*</th>
<th>DASH</th>
<th>Mediterranean</th>
<th>TLC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grains (whole)</td>
<td>6-8 servings/day</td>
<td>Daily Intake</td>
<td>7 servings/day</td>
</tr>
<tr>
<td>Fruits</td>
<td>4-5 servings/day</td>
<td>Daily Intake</td>
<td>4 servings/day</td>
</tr>
<tr>
<td>Vegetables</td>
<td>4-5 servings/day</td>
<td>Daily Intake*</td>
<td>5 servings/day</td>
</tr>
<tr>
<td>Dairy</td>
<td>2-3 servings/day</td>
<td>Weekly Intake**</td>
<td>2-3 servings/day</td>
</tr>
<tr>
<td>*dark, leafy greens</td>
<td></td>
<td>**low fat or fat free</td>
<td></td>
</tr>
<tr>
<td>Eating Pattern</td>
<td>DASH</td>
<td>Mediterranean</td>
<td>TLC</td>
</tr>
<tr>
<td>----------------------</td>
<td>-----------------------</td>
<td>-----------------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td>Nuts, Seeds, Legumes</td>
<td>4-5 servings/week</td>
<td>Daily Intake*</td>
<td>Included as Vegetable</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fats and Oils</td>
<td>2-3 servings/day</td>
<td>Daily Intake EVO</td>
<td>Varies**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lean Protein</td>
<td>&lt;= 6oz per day (limit egg yolks to &lt; 4 per week)</td>
<td>Weekly (2/wk) consumption omega-3 fish</td>
<td>Recommend fish (esp. oily) min 2/wk</td>
</tr>
</tbody>
</table>

*high alpha-linolenic acid

**based upon calorie needs
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<th>Eating Pattern</th>
<th>DASH</th>
<th>Mediterranean</th>
<th>TLC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium</td>
<td>2300 mg/dl (1500 mg/day for specific population groups)</td>
<td>Daily use of herbs and spices instead of sodium</td>
<td>2300 mg/day; ideally 1500 mg/day</td>
</tr>
<tr>
<td>Alcohol</td>
<td>1-2 servings/day based upon gender (<em>for those who consume alcohol</em>)</td>
<td>Daily consumption (red wine) 1-2 glasses per day with meals</td>
<td>Moderate consumption based upon gender, ideally with meals</td>
</tr>
<tr>
<td>Eating Pattern</td>
<td>DASH</td>
<td>Mediterranean</td>
<td>TLC</td>
</tr>
<tr>
<td>----------------------</td>
<td>---------------------------------------------</td>
<td>---------------------------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Sweet and added sugars</td>
<td>( \leq 5 ) servings/week</td>
<td>Occasional consumption (&lt;1 time per week if desired)</td>
<td>No recommendations</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>Daily use of antioxidant herbs and spices</td>
<td>Plant stanols/sterols (2g per day; soluble fiber (5-10 g/day)</td>
<td></td>
</tr>
</tbody>
</table>
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What is the “Mediterranean Diet?”

• Term is used to represent eating patterns across a broad geographical region

• However, there is not one single diet represents economic, cultural, and religious differences that impact eating patterns of this region
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“Mediterranean Diet”

• Variations in food pattern can create contradictory results in studies that focus solely on food components or food groups
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“Mediterranean Diet”

According to Georgoulis et al:

• Shift in dietary habits within this geographical region

• “Mediterranean-style” to represent collection of dietary habits traditionally followed by Mediterranean region countries

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“Mediterranean Diet”

• Characteristics:
  – High consumption olive oil
  – Vegetables, legumes, whole grains, fruits, nuts
  – Moderate consumption of poultry and fish
  – Low consumption of full fat dairy and red meats
  – Low to moderate red wine consumption
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• Compliments various aspects of 2015-2020 Dietary Guidelines/plate method
  – Emphasis upon fruits/vegetables
  – Whole grains
  – Omega fats, nuts, seeds, legumes
Benson et al identifies Mediterranean-style diet upon diabetes:

- Improvement in glycemic control as well as cardiovascular risk in people with diabetes
- Reduction in overall morbidity and mortality of CVD
- Prevention in development of diabetes
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Meta-analysis of 17 studies showed that a Mediterranean-style diet:

• Improvement in fasting glucose and A1c levels for those with Type 2 Diabetes

• Several studies showed that Mediterranean diet lowered glucose levels more than traditional low fat diet
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• Improvement in fasting glucose levels related to positive effect on insulin sensitivity by replacing saturated and \textit{trans} fats with unsaturated fats
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Low Carbohydrate Mediterranean Diet:

- 35% carbohydrate
- 45% fat (50% monounsaturated)
- 20% protein

*Improved glycemic benefit*

Control/Traditional Mediterranean Diet:

- 40-55% carbohydrate
- 30% fat
- 15-20% protein
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In a study by *Esposito et al*, adherence to a Mediterranean style diet:

- Reduced A1c and post prandial glucose levels
- Resulted in participants with lower BMI’s, waist to hip ratios, and prevalence of metabolic syndrome

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• In regards to diabetes prevention those who adhered to a Mediterranean-style diet had a 83% lower risk of diabetes

• Adherence to Mediterranean-style diet, even without caloric restriction, was effective in preventing diabetes among those at high risk of CVD
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• The abundant use of olive oil along with fruits and vegetables has been shown to provide additional benefits:

• Replacing saturated and \textit{trans} with monounsaturated fats (MUFAs) has shown to reduce risk of diabetes
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• Studies have also shown an inverse relationship with adherence to Mediterranean diet and use of olive oil in particular in control of systolic and diastolic blood pressure
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Georgoulis et al notes-

• ATTICA (Greece) study, 3000 participants
  – Inverse relationship between Mediterranean-style diet and odds of developing Type 2 Diabetes
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• 1076 pregnant women from 10 Mediterranean countries
  – Inverse association between adherence to Mediterranean-style diet and development of Gestational Diabetes
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Georgoulis et al state:

- A Mediterranean-style eating pattern as an effective alternative to lower fat/higher carbohydrate eating pattern for those with Type 2 Diabetes
  - Beneficial effect upon glycemic control
  - CVD risk factors
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A Mediterranean-style diet has also been positively associated with:

• Glycemic control and sensitivity
• Cardiovascular risk and related mortality
• Liver function
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- Indirect (weight loss; insulin sensitivity)

- Direct (nutrient dense foods)
  - Increased intake of mono/polyunsaturated fats associated with insulin sensitivity
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- High intake of dietary fiber and antioxidants
  - Improved insulin sensitivity
  - Improved pancreatic Beta Cell secretory capacity
  - Anti-inflammatory and anti-oxidative effects
  - Adiponectin \(\rightarrow\) high levels inversely associated with risk of Type 2 Diabetes
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• Mediterranean-style diet also proposed to:
  – Protect from oxidative stress
    role in insulin resistance and beta cell dysfunction

Protective role of Mediterranean-style diet in conditions involving oxidative stress and inflammation?
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Practical Application of the Mediterranean-Style Diet for people with Diabetes
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Considerations include:

• Patient motivation
• Support system
• Maintaining cultural identity
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Considerations include:

- Food finances
- Small, consistent change over time
- Long term adherence
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S  Specific
M  Measurable
A  Attainable
R  Realistic
T  Timely
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Exploring the new Nutrition Facts Label
### Nutrition Facts

**Serving Size 2/3 cup (55g)**

**Servings Per Container About 8**

<table>
<thead>
<tr>
<th>Amount Per Serving</th>
<th>Calories 230</th>
<th>Calories from Fat 72</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Fat</strong></td>
<td>8g</td>
<td>12%</td>
</tr>
<tr>
<td>Saturated Fat</td>
<td>1g</td>
<td>5%</td>
</tr>
<tr>
<td>Trans Fat</td>
<td>0g</td>
<td></td>
</tr>
<tr>
<td><strong>Cholesterol</strong></td>
<td>0mg</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Sodium</strong></td>
<td>160mg</td>
<td>7%</td>
</tr>
<tr>
<td><strong>Total Carbohydrate</strong></td>
<td>37g</td>
<td>12%</td>
</tr>
<tr>
<td>Dietary Fiber</td>
<td>4g</td>
<td>16%</td>
</tr>
<tr>
<td>Sugars</td>
<td>1g</td>
<td></td>
</tr>
<tr>
<td><strong>Protein</strong></td>
<td>3g</td>
<td></td>
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</tbody>
</table>

**Amount per serving**

**Calories 230**

<table>
<thead>
<tr>
<th>% Daily Value*</th>
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</tbody>
</table>

*Percent Daily Values are based on a 2,000 calorie diet. Your daily value may be higher or lower depending on your calorie needs.

<table>
<thead>
<tr>
<th>Calories:</th>
<th>2,000</th>
<th>2,500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fat</td>
<td>Less than 65g</td>
<td>80g</td>
</tr>
<tr>
<td>Saturated Fat</td>
<td>Less than 20g</td>
<td>25g</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>Less than 300mg</td>
<td>300mg</td>
</tr>
<tr>
<td>Sodium</td>
<td>Less than 2,400mg</td>
<td>2,400mg</td>
</tr>
<tr>
<td>Total Carbohydrate</td>
<td>300g</td>
<td>375g</td>
</tr>
<tr>
<td>Dietary Fiber</td>
<td>25g</td>
<td>30g</td>
</tr>
</tbody>
</table>

### Nutrition Facts

**Serving size 2/3 cup (55g)**

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<td></td>
</tr>
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<td>10%</td>
<td></td>
</tr>
<tr>
<td>Saturated Fat</td>
<td>1g</td>
</tr>
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<td>4g</td>
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<tr>
<td>% Daily Value*</td>
<td></td>
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<tr>
<td>14%</td>
<td></td>
</tr>
<tr>
<td>Sugars</td>
<td>1g</td>
</tr>
<tr>
<td>% Daily Value*</td>
<td></td>
</tr>
<tr>
<td>20%</td>
<td></td>
</tr>
<tr>
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</table>

*The % Daily Value (DV) tells you how much a nutrient in a serving of a food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

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May 2016 FDA introduces new Nutrition Facts label

- Changes reflect 2015-2020 Dietary Guidelines

- “Added Sugars” included to meet nutrient needs while staying within calorie limit
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• “Calories from Fat” removed to emphasize importance of *type* of fat consumes versus *total* amount

• Revised daily values for sodium, fiber and vitamin D
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• Change in references for serving sizes
  (i.e. ½ cup ice cream is now 1 cup)

• Standardized servings for products
  (i.e. 1 can of soup)
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• “Per serving” and “Per package” requirements for products that can be consumed in one or multiple sittings

• Manufacturers required to start implementation by 26 July 2018
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Benefits from these changes include:

• More accurate estimation of calorie/nutrient intake based upon serving size

• Identification of added as well as naturally occurring sugars
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Benefits from these changes include:

• Identification of specific intake of select vitamins/minerals based upon serving size
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In Conclusion:

• Evidence based research has over time necessitated changes to clinical practice guidelines specific to medical nutrition therapy
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In Conclusion:

• These changes are reflected in:
  – Clinical practice guidelines
  – Dietary guidelines
  – Nutrition label
  – Plate method
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In Conclusion:

• Dietary Guidelines for Americans
  – Allows for ethnic and cultural food choices to be maintained within the broader context of these guidelines
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In Conclusion:

• Application tools of these guidelines:
  – Plate method concept
    • Mediterranean plate
  – Revised nutrition label
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In Conclusion:

• Mediterranean-style diet
  – Prevention of diabetes, particularly those at higher cardiovascular risk
  – Improvement in glycemic control for persons with diabetes
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In Conclusion:

• It is the combination of these three:
  – Plate method
  – Mediterranean-style diet
  – New food label
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In Conclusion:

• Allowing the Registered Dietitian/CDE to deliver Medical Nutrition Therapy
  – Evidence based
  – Easy to follow format
  – Patient specific
  – Long term success
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References

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