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Preventative Nutrition Care for the Primary Care Provider

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Disclosures

- I have no disclosures for today's talk

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Outline

- Introduction
- Nutrition assessment methods
  - Nutrition history
  - Physical exam
  - Diagnostic data
  - Identification of malnutrition
- Nutrition and Prevention
  - Obesity and weight management
  - CVD
  - Prediabetes and type 2 diabetes
  - Cancer

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Why perform a nutrition assessment?[1]

- Nutrition plays a critical role in the prevention and management of chronic disease

- Identification of malnutrition
  - Significant predictor/risk factor for morbidity and mortality
  - Higher risks of wounds and ulcers
  - Poor surgical outcomes
  - Greater likelihood of readmissions following hospitalization
  - 50% of hospitalized patients are malnourished, but not all receive a nutrition evaluation
  - Improved surgical and oncologic outcomes when malnutrition is treated

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Provider comfort

- Clinically working PAs in a cross-sectional study on confidence in creating nutrition plans[2]
  - 25% reported feeling very confident
  - 27% reported feeling not confident
- PA students surveyed on their nutrition confidence[3]
  - Half of respondents felt moderately comfortable providing nutrition recommendations
  - 100% felt they needed additional education

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Nutrition assessment tools

- Nutrition histories
  - 24–hour recall
  - Food journals
  - Food frequency questionnaires
- Nutrition-focused physical exam
- Objective clinical data reflective of nutritional status

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Nutrition histories – 24-hour recall

- Patient guided to recall all foods consumed in a 24-hour period

- Strengths in clinical practice
  - Quick and easy to elicit; patients may complete at home and bring to office for interpretation and discussion
- Disadvantages
  - Based on patient memory, estimations of portion sizes, honesty, may not reflect usually intake

- Can increased validity with USDA 5-pass method

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24-Hour Dietary Recall – example (one meal)

Time/meal	Food and Beverage	Amount consumed	How it was prepared	Where consumed	Comments
5:30pm/Dinner	Chicken breast; French fries	8 oz chicken breast	Grilled chicken;	Take out – Chick-fil-a	Felt very full
5:30pm/Dinner	Bun	1 plain hamburger bun	toasted		
5:30pm/Dinner		½ cup of French fries	French fries cooked in oil		
5:30pm/Dinner	Diet Coke	16oz	n/a		

5-Step Multiple-Pass Approach

Step	Purpose
Quick List	Collect a list of foods and beverages consumed the previous day.
Forgotten Foods	Probe for foods forgotten during the Quick List.
Time & Occasion	Collect time and eating occasion for each food.
Detail Cycle	For each food, collect detailed description, amount, and additions. Review 24-hour day.
Final Probe	Final probe for anything else consumed.

https://www.ars.usda.gov/northeast-area/beltsville-md-bhnrc/beltsville-human-nutrition-research-center/food-surveys-research-group/docs/ampm-features/

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USDA Multi-pass method[4]

- Step 1 – uninterrupted list of foods and beverages from patient
- Step 2 - forgotten foods – alcohol, juice, sweets, snack foods, soda, fruits, vegetables, cheese
- Step 3 – time and occasion – similar to 24-hr recall – what time was food consumed, which meal
- Step 4 – Details – Specific amounts, any additive foods (condiments, sugar, cream, ect)
- Step 5 - final questions – Anything else? Anything we forgot?

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24-hour diet recall example questions

- Ask patient about all food and drink consumed in a 24-hour period
- Can focus on the person's "typical day" or use yesterday
- Questions to ask:
  - What was your first, second, third meal of the day? Did you have any snacks?
  - What did you specifically eat at each meal? What did you drink?
  - Estimate the portion size of each food and drink component of each meal – should be done as you ask
  - How does this day differ from any other day of the week

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These questions would be similar for each meal, and the interviewer would subsequently inquire about snacks and desserts.

- What was your first meal of the day?
  Breakfast
- What did you have for breakfast?
  Eggs and toast
- How many eggs did you have, and how were they cooked?
  2 eggs scrambled
- How many pieces of toast? What type of toast?
  2 pieces of toast, whole wheat
- Did you put anything on your toast?
  Yes, butter
- How much butter?
  About 1 pad between two slices
- Did you have anything to drink?
  Yes, black coffee

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Basic portion size guidelines

Foods	Serving Sizes to Know	Nutrients
Starches (cereal, oatmeal, rice, pasta, quinoa, ect)*	1/3 cup; 1 slice of bread; ¼ of a bagel	15 gm CHO, 3gm pro, 0-1 fat, 80 cal
Fruit	½ cup; ½ banana, 1 tennis ball sized (apple, peach, plum, ect)	15 gm CHO, 60 cal
Starchy Veggies (potato, corn, peas)	¼ baked potato; ½ cup (corn, peas)	15 gm CHO, 3gm pro, 0-1 fat, 80 cal
Dairy	1 cup milk; ¾ yogurt	12 gm CHO, 8 gm pro, 0-8gm fat, 0-150 cal
Meats/Protein	1 oz	0 gm CHO, 7 gm pro, 0-8 gm fat, 35-100 cal
Fats	1 tsp oil, butter, mayo; 1 Tbsp salad dressing	0 gm CHO, 0 gm pro, 5gm fat, 45 cal

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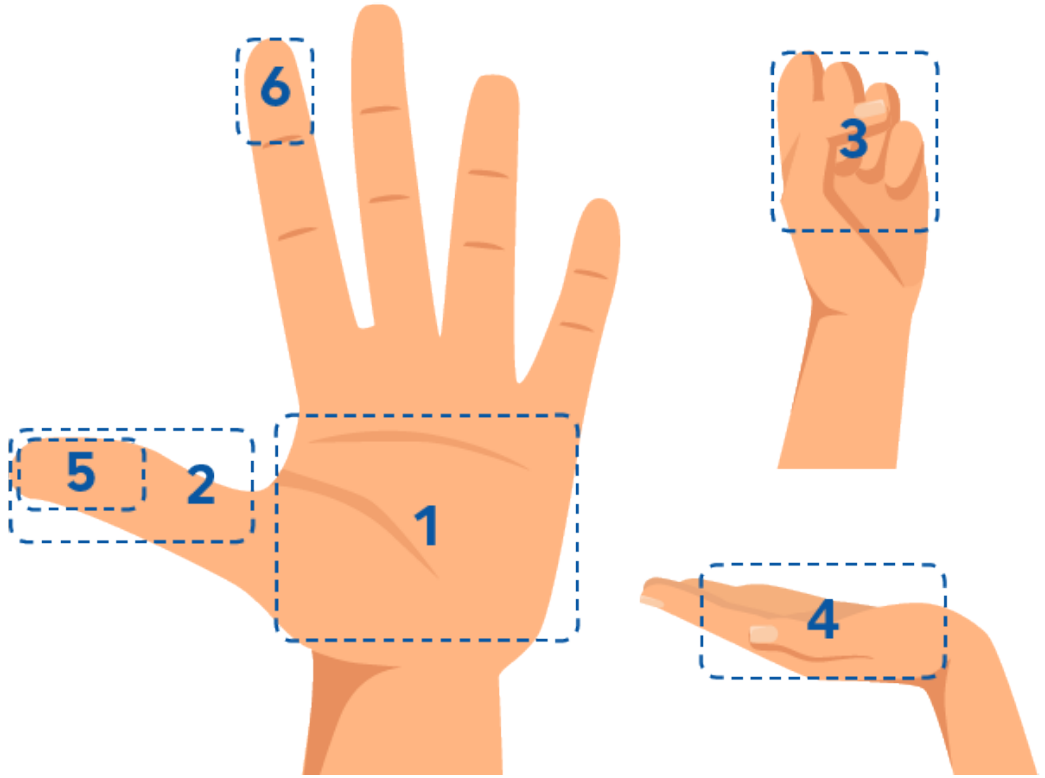
Portion size estimates – CDC[5]

- **3 ounces of meat, fish, or poultry**
  Palm of hand (no fingers)
- **1 ounce of meat or cheese**
  Thumb (tip to base)
- **1 cup or 1 medium fruit**
  Fist
- **1–2 ounces of nuts or pretzels**
  Cupped hand
- **1 tablespoon**
  Thumb tip (tip to 1st joint)
- **1 teaspoon**
  Fingertip (tip to 1st joint)



https://www.cdc.gov/diabetes/managing/eat-well/meal-plan-method.html

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Other Tools

- Food Records or food logs – comment to see 3 to 7 day food records
  - Patient completes on their own
  - Foods consumed are recorded immediately after eating to reduce likelihood of forgetting
  - Disadvantages
    - Continues to be dependent on accuracy and honesty in reporting both portion size and intake
    - Time demanding for patient

- Electronic Diet Applications – MyFitnessPal
  - Helpful as this calculates calories, macro and micronutrient information for the patient and clinician.

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Food Record Examples – Same as 24-hour recall

Time/meal	Food and Beverage	Amount consumed	How it was prepared	Where consumed	Comments

Example from the CDC:

[My Food Diary (cdc.gov)]

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Food Frequency Questionnaires

- FOOD FREQUENCY QUESTIONNAIRE (nih.gov) – example from the NIH
- Allows clinicians to determine frequency of food and food group consumption
- Standardized and validated instruments

- Disadvantages:
  - Lengthy form, time consuming to complete and review, requires high literacy and knowledge of portion sizes

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Evaluation of Nutrient Intake

- Diet analysis software – may find this at an RD's office
- USDA reference tables - https://fdc.nal.usda.gov/fdc-app.html#/
- **Portion sizes AND Diabetic exchange lists**

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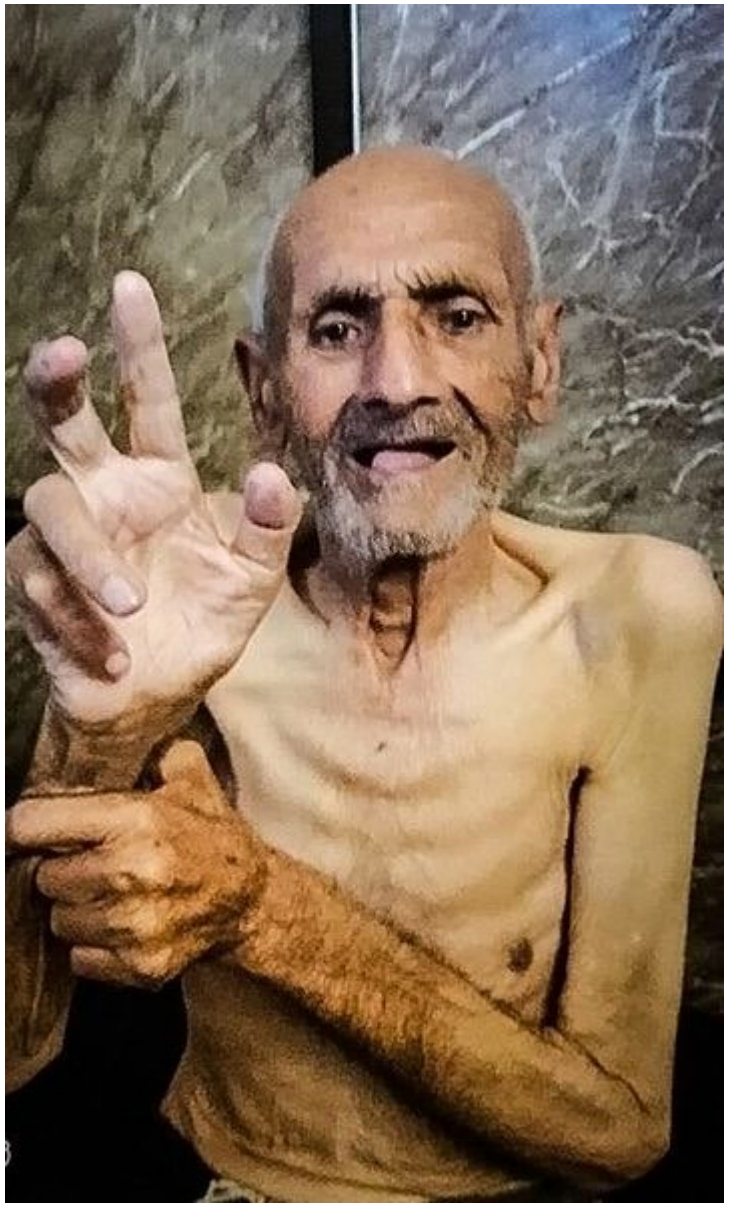
Nutrition focused PE

Nutrition focused PE

- Anthropometric data – Ht, Wt, BMI
  - Specifically looking historically for wt loss/wt gain
  - CNs – May give cues to swallowing difficulties if palsies present
  - Oral cavity – poor dentition, oral ulcers will affect food consumption
  - MSS – look for typical areas of muscle, and fat wasting, reduced muscle strength – particularly grip
  - PV – Edema



Pitting at temples – wasting of temporalis muscle

Pitting around clavacles

Boney humeral head – loss of deltoid mass

Loss of intercostal adipose tissue and intercostal muscle

On posterior thorax → wasting of lats & trapezious leads to scapular widening

Lost of muscle mass of the calfs

ALSO SEE: orbital fat loss, loss of adipose at posterior triceps

Edema – third spacing secondary to reduce intravascular protein

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Malnutrition – definitions[6]

- Simple def → Any nutrition imbalance
- Standardized from ASPEN and AAND → any 2 of the following 6 criteria
  - 1) Insufficient energy intake
  - 2) Weight loss
  - 3) Loss of muscle mass
  - 4) Loss of Sub Q Fat
  - 5) Localized or generalized fluid accumulation (edema)
  - 6) Diminished functional status (as tested by hand grip strength)

- Need a thorough history and physical exam!

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Abbreviated evaluation – for malnutrition[1]

- Pre-op Nutrition Score (PONS)
  - BMI < 18.5 or <20 if 65 or older
  - 10% or greater unintentional wt loss in the past 6 months
  - Serum Albumin < 3.0
- Yes to any of the above – dietitian referral

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Diagnostic data for nutrition assessment

- Serum albumin
  - Interpret with caution; influenced by inflammatory states
- Pre-albumin
  - Influenced by inflammatory states; may predict acute changes in nutritional status before albumin
- C-reactive protein level
  - Marker of inflammation, may predict response to nutrition therapy
- CT lean body mass scan
  - Aid in determining risk prior to surgery

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Evaluation for common nutritional deficiencies

- Hemoglobin
  - Anemias
- B12, folic acid
- Ferritin, serum iron/TIBC

- Vitamin D

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Nutrition and Prevention

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Nutrition and weight management

- No evidence to strongly support one dietary approach to weight loss
- May utilize a variety of methods
  - Individualize based on patient preferences and cultural practices when recommending dietary changes
- GOAL – create calorie deficit! Calories in < Calories out
  - 500 calories per day deficit = 1 lb per week wt loss
  - Variety of approaches: low fat, low carbohydrate/ketogenic diet, Mediterranean diet, DASH diet, Dietary Guidelines for Americans (DGA), Intermittent fasting (IF)

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Nutrition and weight management – diet descriptions[7]

- Low carbohydrate and ketogenic diets
  - Ketogenic diets – 5% of macronutrients come from carbohydrates
    - Less than 20 grams of carbohydrates per day
  - Low carbohydrate diets – typically 50grams to 150 grams of carbohydrate per day
  - No restrictions on types or amounts of fat
  - Protein generally ranges from 5 to 20% of macronutrient intake

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Nutrition and weight management – diet descriptions

- Mediterranean diet[8]
  - No universal definition
  - Is high in olive oil, nuts, legumes, vegetables, fruits, whole grains
  - Low to moderate in animal products
- DASH diet – daily/weekly recs[9]
  - 7 servings of carbohydrates
  - 2 servings of low-fat dairy products
  - 2 servings of lean red meat
  - 5 servings of vegetables, 5 servings of fruits
  - 2 or 3 weekly servings of nuts and seeds

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Nutrition and weight management – diet descriptions

- DGAs[10]
  - Emphasizes healthy dietary pattern of nutrient-dense foods
  - Limit added sugars to less than 10% of total daily calories
  - Limit saturated fat to less than 10% of total daily calories
  - Limit sodium to 2,300mg/day
  - Limit alcohol – 2 drinks/day for men, 1 drink/day for women

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Nutrition and weight management – diet descriptions

- IF[11]
  - Periodic fasting – 1-2 days per week of fasting (up to 25% of calories) other days regular eating habits
  - Alternate day fasting – no calories consumed alternated with regular eating habits
  - Time-restricted feeding – fasting of at least 12 hours with regular eating outside this time on a daily basis

Nutrition and weight management

- Results from a systematic review and meta-analysis comparing across dietary interventions found[12]
  - Median wt loss on:
  - low carbohydrate diets of 4.63 kg (10.1 lbs) after 6 months
  - low fat diet of 4.37 kg (9.6 lbs)
    - No significant differences when compared to each other at 6 months
  - Mediterranean diet 2.87 kg
  - DASH diet 3.64 kg
    - DASH and Mediterranean diet slightly less effective than low carbohydrate for weight loss

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Nutrition and weight management

- IF systematic review – a variety of approaches[13]
  - Reductions from baseline body wt across studies ranged from 0.8% to 13%
  - When compared to continuous energy restriction (daily caloric reductions) results not significant
    - Continuous energy restriction lead to reductions in wt by 6.65 kg and IF reduced wt by 4.97 kg (in single, largest study in systematic review)
  - Appears to be an equivalent approach to daily energy restrictions
  - Optimal fasting window may be 16 hours
  - Weight loss augmented with exercise
  - IF has higher dropout rates than other dietary interventions

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Nutrition and weight management

- Bottom line recs
  - Energy reductions must be accomplished to produce weight loss
  - Can be accomplished by a variety of approaches that do not appear significantly different from one another
  - Individualize approach to personal preference
  - Replace higher calorie foods with nutrient dense foods – focus on dietary pattern
  - A good opportunity to take a nutrition history and make recommendations based on personal intake
    - Emphasize: vegetables, fruits, whole grains, lean meats, unsaturated fat sources
    - De-emphasize: added sugars, trans-fatty acids, fatty meats and high fat dairy, added salt, sugar-sweetened beverages, alcohol

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Nutrition and cardiovascular disease

- Dietary goals:
  - Promotion of foods to reduce LDL and total cholesterol, improve HDL
  - Promote foods to reduce BP and prevent HTN
  - Prevent atherosclerosis, endothelial dysfunction, MI, strokes, CHF

- Variety of beneficial dietary approaches
  - Commonly utilized: Mediterranean diet, vegan/vegetarian diet, DAGs

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Nutrition and cardiovascular disease – Mediterranean diet

- Evidence from a 2019 Cochran review – 30 RCTs, 49 total studies[14]
- Primary prevention – low to moderate evidence
  - Mildly reduced total cholesterol
  - Mildly reduced systolic (2.99 mmHg) and diastolic BP (2 mmHg)
  - Mild to no significant changes in LDL, HDL, or triglycerides
- Secondary prevention – low to moderate evidence[14]
  - Reduction in MI and CVD mortality when compared to usual care
  - Reduction in stroke, PAD when compared to low-fat diet
- US VA incorporates Mediterranean diet into primary and secondary prevention recommendations for higher risk patients[15]

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Nutrition and cardiovascular disease

- Systematic review exploring vegan diets and CVD risk[16]
  - ORs for CVD endpoints including CVD & CHD death not significant when compared to omnivore diets
  - No difference in MI occurrence
  - Possible increased risk of ischemic stroke with vegan diet, though also reduced carotid artery intima-media thickness with vegan diet
- Cochrane review of IF and CVD risk demonstrated inadequate evidence to recommend for prevention of CVD endpoints[11]
- A separate systematic review and meta-analysis specifically looking at alternate-day fasting showed reduced total cholesterol levels (-8.14 mg/dl)[17]
  - No significant changes on triglycerides, HDL, LDL, SBP, DBP

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Nutrition and cardiovascular disease

- 2019 AHA/ACA guidelines for primary prevention of CVD[18]
  - Emphasize Mediterranean, vegetarian, DASH diet eating patterns
  - Highest in vegetable, fruit, plant-based and lean protein sources, whole grain, and some studies demonstrating benefits of low-fat dairy consumption
  - Higher risk of cardiovascular disease with animal protein → animal protein sources increase CVD mortality by 61%, and replacement with nuts and seeds reduced by 40%
  - A good goal – 5-9 servings of fruit and vegetables per day!

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Nutrition, prediabetes, and type 2 DM

- Recommendations for prevention and management of type 2 diabetes are similar
- Commonly recommended dietary patterns include
  - Mediterranean diet
  - DASH diet
  - Low carbohydrate diets
  - “Plant-based diet”
  - No one of these is seen as superior to another

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Nutrition, prediabetes, and type 2 DM

- Low carbohydrate diets[19,20]
  - Use preventively or therapeutically
  - Higher rates of DM remission compared to control diets
  - Frequently found to reduce need for DM medications in type 2
  - Weight loss initially, then becomes less significant at 12 months of study duration
    - Likely related to difficulty in maintaining
  - May be easier to use a modified low carbohydrate diet (less than 130gm/d) opposed to ketogenic (less than 20 grams per day)

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Nutrition, prediabetes, and type 2 DM

- Mediterranean diet
  - Highest adherence in prospective cohort studies compared to lowest demonstrated a 21% lower risk of developing type 2 diabetes[21]
  - Some evidence that combining with a modified low-carbohydrate pattern (up to 40-45% carbohydrate of total energy intake) further improves A1c and CVD markers[22]
    - Increased HDL, reduced triglycerides
- Vegetarian/vegan diet[23]
  - Results from prospective cohort studies appear mixed for prevention of diabetes compared to omnivore diet
  - However, highest consumption of healthy plant-based foods appears to reduce risk of developing diabetes

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Nutrition, prediabetes, and type 2 DM

- IF pattern
  - Does not appear to be significantly better than daily calorie reduction for glucose control
  - Systematic review comparing both patterns demonstrated no significant differences at 1 and 3 months duration[11]
  - However is safe, and could be a potential option to reduce A1c and weight in patients with DM2[24]

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Nutrition, prediabetes, and type 2 DM

- Bottom line recs
  - Mediterranean dietary pattern that emphasizes vegetables, fruit, whole grains, olive oil and replacement of saturated fats with unsaturated.
  - Increased plant-based proteins
  - Complex carbohydrate consumption in controlled amounts
    - 45 – 60 grams of carbohydrate per meal (if three meal a day pattern)
    - Less if following a ketogenic diet pattern (less than 20-50gm)
  - Educate patient on portion sizes – focus on carbohydrate
  - Consider combined approaches
    - Low-carbohydrate + Mediterranean
    - Mediterranean + IF or Daily calorie reduction if wt loss desired

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Foods	Serving Sizes to Know	Nutrients
Starches (cereal, oatmeal, rice, pasta, quinoa, ect)*	**1/3 cup; 1 slice of bread**	**15 gm CHO, 3gm pro, 0-1 fat, 80 cal**
Fruit	**½ cup; ½ banana, 1 tennis ball sized (apple, peach, plum, ect)**	**15 gm CHO, 60 cal**
Starchy Veggies (potato, corn, peas)	**¼ baked potato; ½ cup (corn, peas)**	**15 gm CHO, 3gm pro, 0-1 fat, 80 cal**
Dairy	**1 cup milk; ¾ yogurt**	**12 gm CHO, 8 gm pro, 0-8gm fat, 0-150 cal**
Meats/Protein	1 oz	0 gm CHO, 7 gm pro, 0-8 gm fat, 35-100 cal
Fats	1 tsp oil, butter, mayo; 1 Tbsp salad dressing	0 gm CHO, 0 gm pro, 5gm fat, 45 cal

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Nutrition and cancer prevention

- Guidelines from the American Cancer Association[25]
- Emphasize:
  - Foods that are high in nutrients in amounts that help achieve and maintain a healthy body weight
  - A variety of vegetables—dark green, red, and orange
  - fiber-rich legumes
  - Fruits – emphasize whole fruits with a variety of colors
  - Whole grains
- Limit:
  - Red and processed meats
  - Sugar-sweetened beverages
  - Highly processed foods and refined grain products
  - Alcohol (best not to consume)

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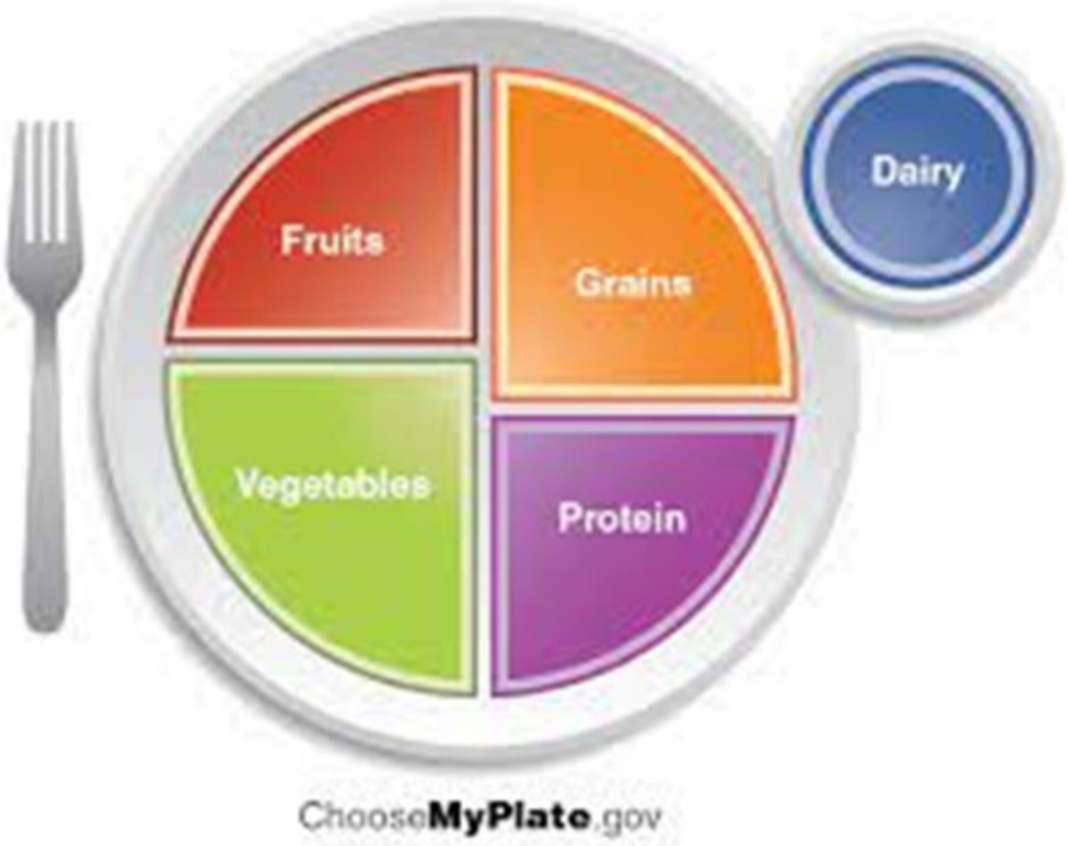
The Plate Method



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Final points

- Individualize your recommendations based on food preferences and cultural practices
  - Take a good nutrition history or use a nutrition evaluation tool
- Base recommendations on the patient's risk profile and current comorbidities
- Mutual decision-making that is patient-led
- Began with attainable goals – consider setting a SMART goal so as not to overwhelm
- Determine patient's readiness to change
- Be pragmatic – do not get trapped into a singular dietary approach
- **If there were one diet that worked for all, there would only be one diet!**

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