

# Nutrition

**Debra K. Sullivan, PhD, RD**

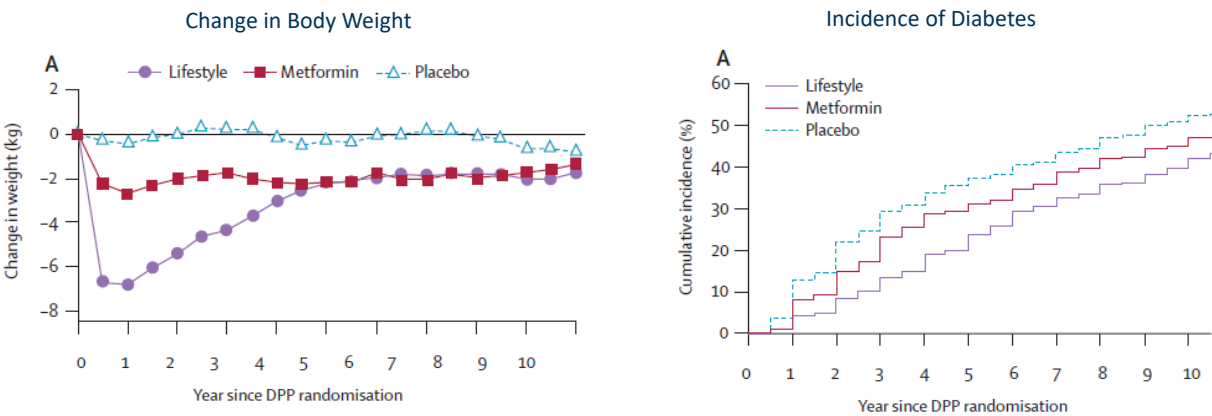
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University of Kansas Medical Center



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## Diet and Exercise Lifestyle Interventions Alone Can Work

10 Year Results of Diabetes Prevention Program



Knowler WC 2009, *Lancet*.



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## Diet Quality vs Quantity

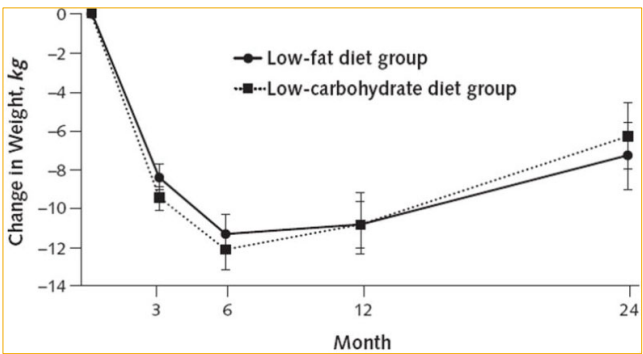
- ✓ Increase diet quality, thereby decrease calories
  - ✓ Micronutrients
  - ✓ Phytochemicals
  - ✓ Fiber
- ✓ Fullness (satiety) is driven by the *volume* of food more than calories
  - ✓ Fat and sugar pack a lot of calories in a small volume



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## What Diet to Prescribe?

### Low Fat vs. Low Carb



- Both received intensive lifestyle program
- No difference at any time point

Foster et al. Ann Intern Med. 2010.

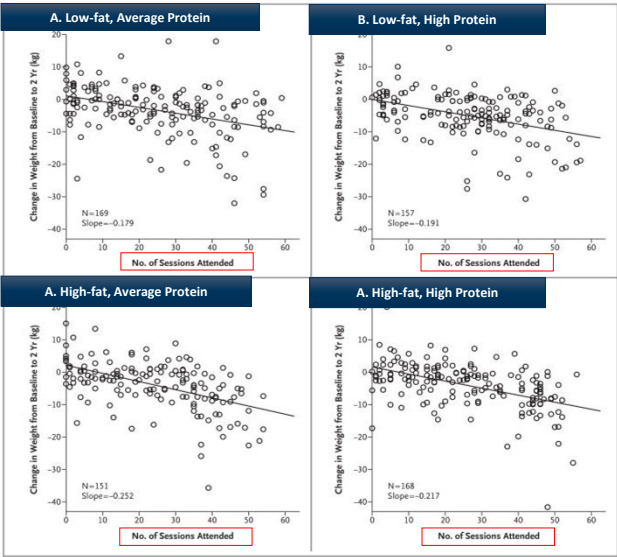


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What Diet to Prescribe?

How much Fat, Protein, Carb?

- POUNDS LOST → Harvard trial examining variation in macronutrients
  - No difference in long-term
  - Key factor is diet adherence!



Sacks et al. NEJM. 2009.

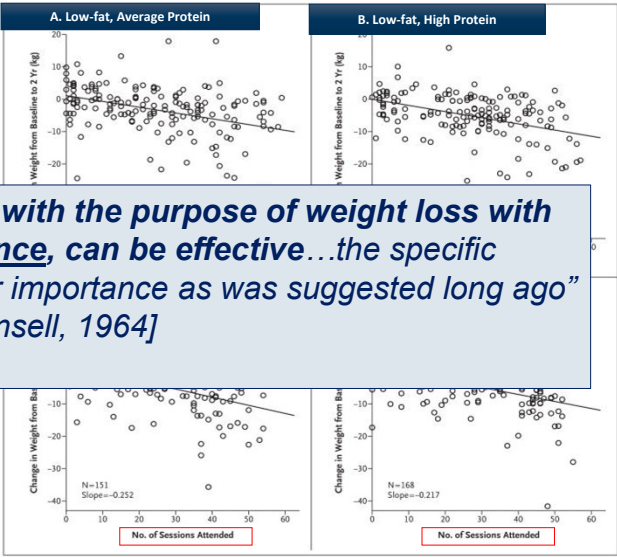


What Diet to Prescribe?

How much Fat,

*“Any type of diet, when taught with the purpose of weight loss with enthusiasm and persistence, can be effective...the specific macronutrient content is of minor importance as was suggested long ago”*  
[Kinsell, 1964]

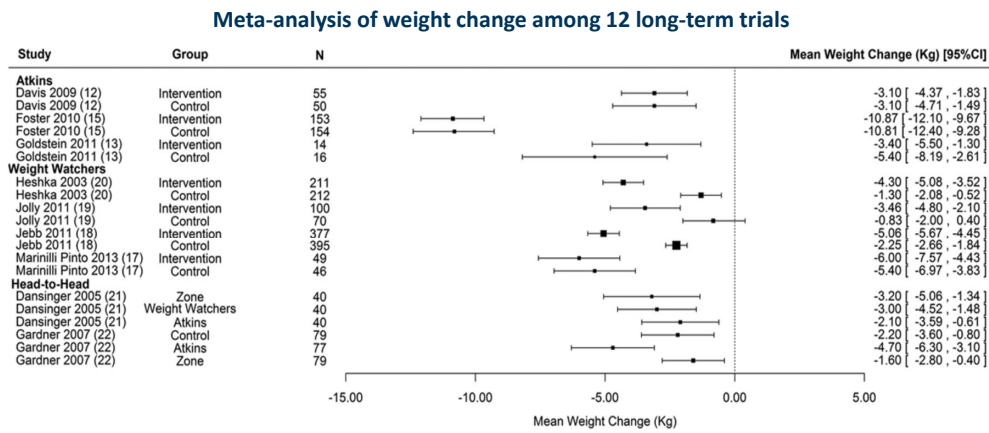
- Key factor is diet adherence!



Sacks et al. NEJM. 2009.



What About Popular Diets in the Long Term  
Atkins, Zone, and Weight Watchers



“Despite millions of dollars spent on popular commercial diets, data are conflicting and insufficient to identify one popular diet as being more beneficial than the others.”

Atallah et al. Circ Cardiovasc Qual Outcomes, 2014.



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Healthy Dietary Patterns

High-quality carbohydrates

- Fruits, non-starchy vegetables, whole grains, beans

Variety of proteins

- Lean meats, seafood, eggs, beans, legumes, nuts

High-quality fats

- Nuts, seeds, fish, vegetable oils
- Small serving sizes

Reduce poor-quality carbs and processed foods

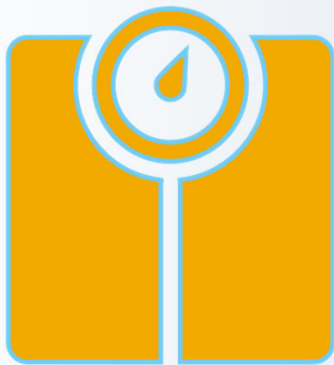
- Sugar-sweetened beverages, refined grains, processed foods

Hildebrand CA, Gaviria DB, Samuel-Hodge CD, Ammerman AS, Keyserling TC. How Physicians Can Assess and Address Dietary Behaviors to Reduce Chronic Disease Risk. Med Clin North Am. 2022 Sep;106(5):785-807.



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### Reduced Calorie Guidelines



**For weight loss:**

- 500-1000 calorie reduction per day
- 1200-1500 kcal/day if < 250 lbs
- 1500-1800 kcal/day if ≥ 250 lbs

**For weight loss maintenance:**

- Personalized calorie goal
- Standard equations based on sex, age, activity level
- Mifflin-St. Jeor equation
- <https://reference.medscape.com/calculator/846/mifflin-st-jeor-equation>

Look AHEAD Research Group. Lancet Diabetes Endocrinol. 2016 Nov;4(11):913-921.



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### MyPlate Calculate Calorie Needs

### MyPlate Plan

The MyPlate Plan shows your food group targets – what and how much to eat within your calorie allowance.

Your food plan is personalized, based on your:

- Age
- Sex
- Height
- Weight
- Physical activity level

To get started, click on the "Start" button. You can also find out your MyPlate Plan in [Spanish](#).

Get the MyPlate Plan widget to post or share on your blog or website!








Get the Widget

<https://www.myplate.gov/myplate-plan>



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MyPlate – Automated Dietary Recommendations

Food Group Amounts for 1,800 Calories a Day for Ages 14+ Years				
				
1½ cups	2½ cups	6 ounces	5 ounces	3 cups
Focus on whole fruits	Vary your veggies	Make half your grains whole grains	Vary your protein routine	Move to low-fat or fat-free dairy milk or yogurt (or lactose-free dairy or fortified soy versions)
Focus on whole fruits that are fresh, frozen, canned, or dried.	Choose a variety of colorful fresh, frozen, and canned vegetables—make sure to include dark green, red, and orange choices.	Find whole-grain foods by reading the Nutrition Facts label and ingredients list.	Mix up your protein foods to include seafood; beans, peas, and lentils; unsalted nuts and seeds; soy products; eggs; and lean meats and poultry.	Look for ways to include dairy or fortified soy alternatives at meals and snacks throughout the day.
	Choose foods and beverages with less added sugars, saturated fat, and sodium. Limit: <ul style="list-style-type: none"><li>• Added sugars to &lt;45 grams a day.</li><li>• Saturated fat to &lt;20 grams a day.</li><li>• Sodium to &lt;2,300 milligrams a day.</li></ul>			Be active your way: Children 6 to 17 years old should move 60 minutes every day. Adults should be physically active at least 2½ hours per week.

<https://www.myplate.gov/myplate-plan>









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MyPlate Trackers (App and Paper)

MyPlate Plan

Write down the foods you ate today and track your small changes, bite by bite.


Food group targets for an 1,800-calorie* pattern are:		Write down your food choices for each food group.	Did you reach your target?
	<b>1½ cups</b> 1 cup of fruits counts as: <ul style="list-style-type: none"><li>• 1 cup raw or cooked fruit; or</li><li>• ½ cup dried fruit; or</li><li>• 1 cup 100% fruit juice.</li></ul>	<div></div> <div></div> <div></div>	<div>Y</div> <div>N</div>
	<b>2½ cups</b> 1 cup of vegetables counts as: <ul style="list-style-type: none"><li>• 1 cup raw or cooked vegetables; or</li><li>• 2 cups leafy salad greens; or</li><li>• 1 cup 100% vegetable juice.</li></ul>	<div></div> <div></div> <div></div>	<div>Y</div> <div>N</div>
	<b>6-ounce equivalents</b> 1 ounce of grains counts as: <ul style="list-style-type: none"><li>• 1 slice bread; or</li><li>• 1 ounce ready-to-eat cereal; or</li><li>• ½ cup cooked rice, pasta, or cereal.</li></ul>	<div></div> <div></div> <div></div>	<div>Y</div> <div>N</div>
	<b>5-ounce equivalents</b> 1 ounce of protein foods counts as: <ul style="list-style-type: none"><li>• 1 ounce seafood, lean meats, or poultry; or</li><li>• 1 egg; or</li><li>• 1 Tbsp peanut butter; or</li><li>• ¼ cup cooked beans, peas, or lentils; or</li><li>• ½ ounce unsalted nuts or seeds.</li></ul>	<div></div> <div></div> <div></div>	<div>Y</div> <div>N</div>
	<b>3 cups</b> 1 cup of dairy counts as: <ul style="list-style-type: none"><li>• 1 cup dairy milk or yogurt; or</li><li>• 1 cup lactose-free dairy milk or yogurt; or</li><li>• 1 cup fortified soy milk or yogurt; or</li><li>• 1½ ounces hard cheese.</li></ul>	<div></div> <div></div> <div></div>	<div>Y</div> <div>N</div>

**Limit:**

- Added sugars to <45 grams a day.
- Saturated fat to <20 grams a day.
- Sodium to <2,300 milligrams a day.

Y

N

**Be active your way:**  
Children 6 to 17 years old should move 60 minutes every day. Adults should be physically active at least 2½ hours per week.

Y

N

\* This 1,800-calorie pattern is only an estimate of your needs. Monitor your body weight and adjust your calories if needed.



FNS-904-24  
July 2021

USDA is an equal opportunity provider, employer, and lender.

<https://www.myplate.gov/myplate-plan>



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# Protein is IMPORTANT During Weight Loss

## Benefits of Protein During Weight Loss

- Increased satiety
  - Slower digestion
  - Hormone regulation
    - Suppressing ghrelin & boosting GLP-1 and peptide YY
- Muscle preservation
  - Improved body composition
- Thermic effect of food

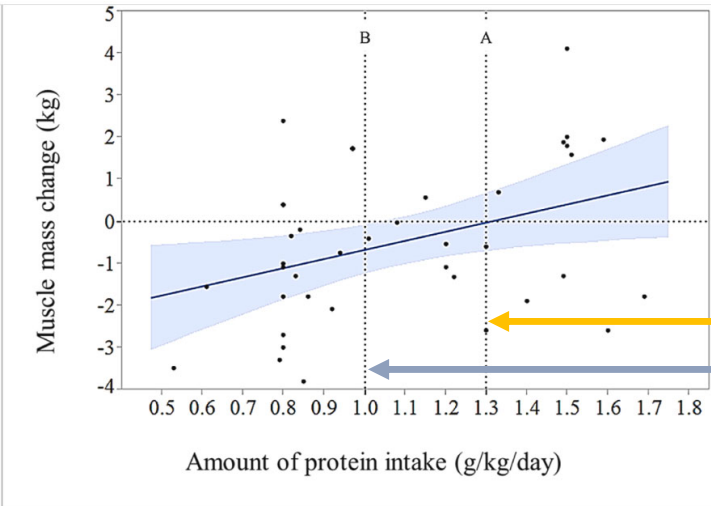
## Recommendations

- Recommendation: No consensus
  - ~1.0 – 1.2 g/kg; some suggest higher
  - However, at high body weights, g/kg actual body weight may be unrealistic
- Acceptable Macronutrient Range 10-35% of total Calories



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## Enhanced protein intake on maintaining muscle mass, strength, and physical function in adults with overweight/obesity: A systematic review and meta-analysis



47 studies (n = 3218)

- Increased protein intake significantly prevents muscle mass decline
- Enhanced protein intake did not significantly prevent decreases in muscle strength and physical function.


Protein intake >1.3 g/kg/day is expected to increase muscle mass (line A), while <1.0 g/kg/day is at high risk of a decrease in muscle mass (line B) Fig. 3: Relationship between amount of protein intake and muscle mass change.

Kokura, et al, Clinical Nutrition ESPEN, October 2024,

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### Quick Tips for Common Questions

- Water
  - Enough to maintain clear light urine color
- Beverages
  - Little to no alcohol, soda, high calorie coffee drinks
- Low Sodium
  - < 2300 mg/day
- Eating Out
  - Americans spend ~40% of food budget eating out
  - Excess calories, poor diet quality
- Snacking
  - ~1/3 total calories of U.S. adults come from snacks
  - Excess calories, poor diet quality
- Condiments
  - Hidden calories
- Supplements
  - Multivitamin
- Meal times
  - Eat at regular meal times, Avoid eating late



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### High Volume of Food = Increased Satiety



355 calories



348 calories

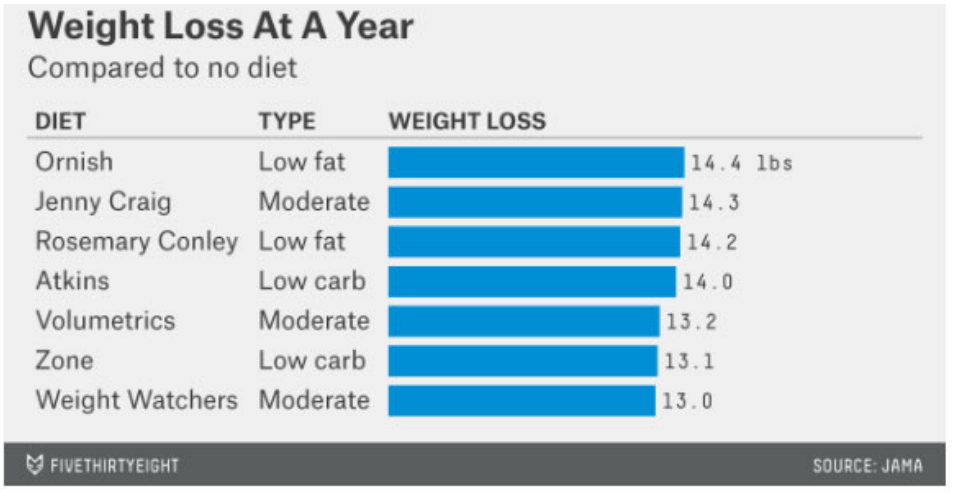


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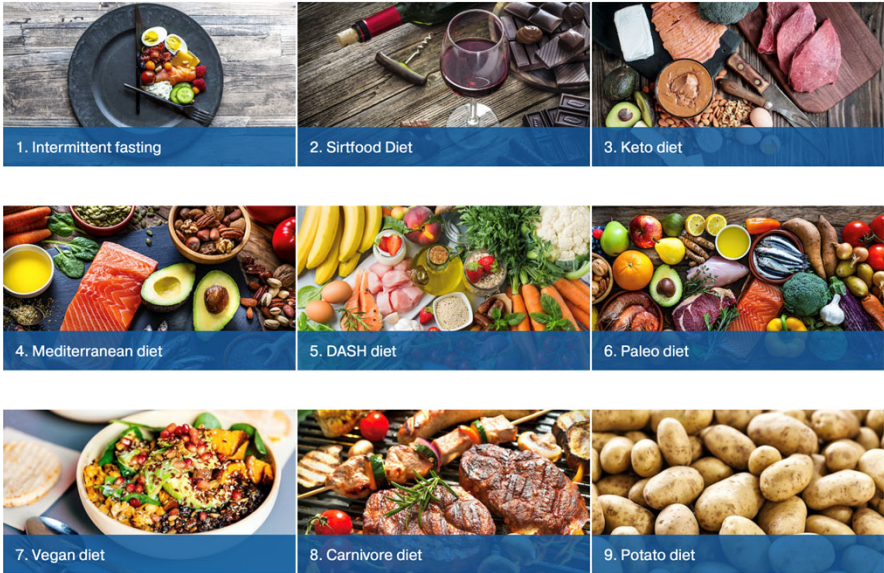
Specific Diet Approaches

A variety of healthy diets work if they are sustained for the long term!



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Popular Diets in 2024



<https://utswmed.org/medblog/diets-best-and-worst/>

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## Intermittent Fasting

- **Focus on when you eat**
  - Alternate Day Fasting; 5:2
  - Time Restricted Eating (16:8; Eat-Stop-Eat)
- **Pros**
  - Flexible
  - Minimal food restrictions
- **Cons**
  - Incompatible for those taking medication that requires regular food intake.
  - For some, fasting can also lead to overeating, undereating, or irritability.
- **Do not utilize**
  - History of eating disorders

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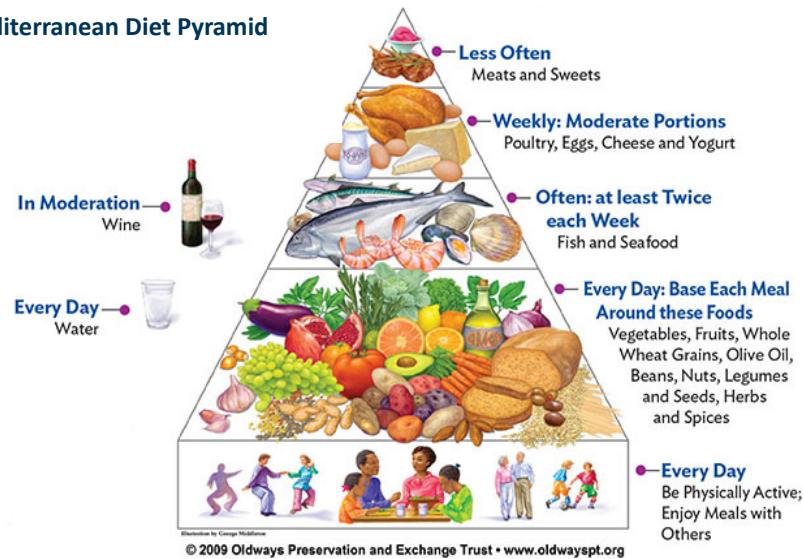
## Keto Diet

- **Goal**
  - Low-carb, high-fat ketogenic diet
  - Well formulated keto diet replaces carbohydrates with unsaturated fats.
- **Pros**
  - Weight loss
- **Cons**
  - Most people eat a lot of saturated fats - butter, oil, cheese, and red meat.
  - Some may increase in cholesterol, kidney complications, or heart palpitations.

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Diets for Specific Diseases

Mediterranean Diet Pyramid



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Healthy Mediterranean-Style Dietary Pattern for Ages 2 and Older, With Daily or Weekly Amounts From Food Groups, Subgroups, and Components

CALORIE LEVEL OF PATTERN	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200
FOOD GROUP OR SUBGROUP <sup>a</sup>	Daily Amount <sup>b</sup> of Food From Each Group (Vegetable and protein foods subgroup amounts are per week.)											
Vegetables (cup eq/day)	1	1 1/2	1 1/2	2	2 1/2	2 1/2	3	3	3 1/2	3 1/2	4	4
Vegetable Subgroups in Weekly Amounts												
Dark-Green Vegetables (cup eq/wk)	1/2	1	1	1 1/2	1 1/2	1 1/2	2	2	2 1/2	2 1/2	2 1/2	2 1/2
Red and Orange Vegetables (cup eq/wk)	2 1/2	3	3	4	5 1/2	5 1/2	6	6	7	7	7 1/2	7 1/2
Beans, Peas, Lentils (cup eq/wk)	1/2	1/2	1/2	1	1 1/2	1 1/2	2	2	2 1/2	2 1/2	3	3
Starchy Vegetables (cup eq/wk)	2	3 1/2	3 1/2	4	5	5	6	6	7	7	8	8
Other Vegetables (cup eq/wk)	1 1/2	2 1/2	2 1/2	3 1/2	4	4	5	5	5 1/2	5 1/2	7	7
Fruits (cup eq/day)	1	1	1 1/2	2	2	2 1/2	2 1/2	2 1/2	2 1/2	3	3	3
Grains (ounce eq/day)	3	4	5	5	6	6	7	8	9	10	10	10
Whole Grains (ounce eq/day) <sup>d</sup>	1 1/2	2	2 1/2	3	3	3	3 1/2	4	4 1/2	5	5	5
Refined Grains (ounce eq/day)	1 1/2	2	2 1/2	2	3	3	3 1/2	4	4 1/2	5	5	5
Dairy (cup eq/day) <sup>e</sup>	2	2 1/2	2 1/2	2	2	2	2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2
Protein Foods (ounce eq/day)	2	3	4	5 1/2	6	6 1/2	7	7 1/2	7 1/2	8	8	8
Protein Foods Subgroups in Weekly Amounts												
Meats, Poultry, Eggs (ounce eq/wk)	10	14	19	23	23	26	28	31	31	33	33	33
Seafood (ounce eq/wk) <sup>f</sup>	3	4	6	11	15	15	16	16	17	17	17	17
Nuts, Seeds, Soy Products (ounce eq/wk)	2	2	3	4	4	5	5	5	5	6	6	6
Oils (grams/day)	15	17	17	22	24	27	29	31	34	36	44	51
Limit on Calories for Other Uses (kcal/day) <sup>g</sup>	130	80	90	120	140	240	250	280	300	330	400	540



Dietary Guidelines for Americans

[https://www.dietaryguidelines.gov/sites/default/files/2020-12/Dietary\\_Guidelines\\_for\\_Americans\\_2020-2025.pdf](https://www.dietaryguidelines.gov/sites/default/files/2020-12/Dietary_Guidelines_for_Americans_2020-2025.pdf)



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Diets for Specific Diseases



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Meal Replacements for Weight Loss

- Highly structured
- Built-in portion control
- Easy to follow
- Quick weight loss success, reinforces confidence




Jenny Craig®

NutriSystem®




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## The RETOOL Jumpstart Plan




**2 Protein Shakes**

- 100-140 calories, 10-25 grams of protein and less than 5 g of fat per serving.
- Whey protein recommended. Do not to use protein bars.
- Mix with water or other calorie-free drink to mix (not milk).



**2 Prepackaged Meals**

- Less than or equal to 350 calories per serving.
- Choose from frozen entrees, canned soup, or labeled/package fresh meals.
- If unable to use a prepackaged meal, make sure your meal is 350 calories or less.



**5 or More Servings of Fruit and Vegetables**

- Any combination of fruits and vegetables totaling 5 or more total servings per day.
- Serving = 1 piece of fruit or 1 cup fresh/frozen fruits and veggies.
- 1 serving of leafy greens = 3 cups
- 1 serving of beans = ½ cup



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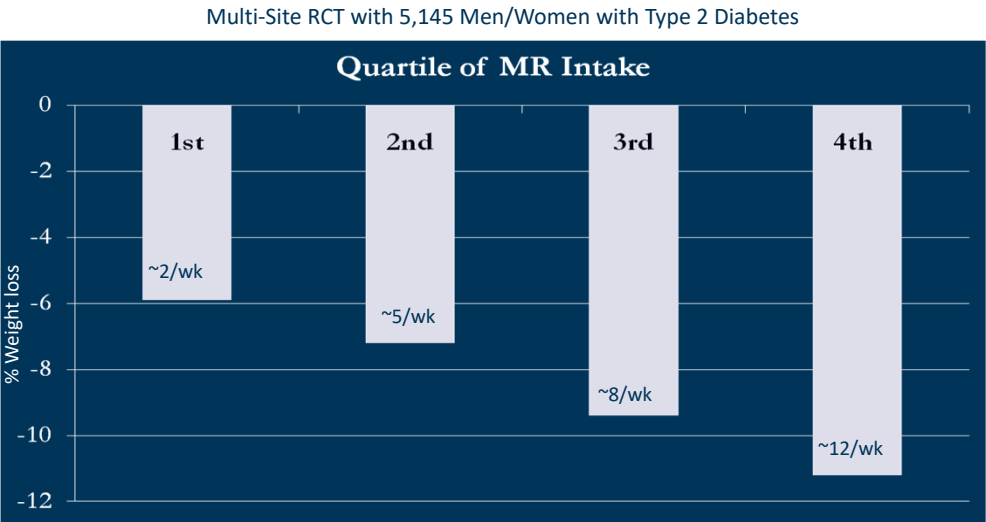
## Why We Use Jumpstart

- ✓ Simple
  - Pre-portioned meals eliminate guess work and estimating
- ✓ Improves overall diet quality
  - By increasing fruits and vegetables and providing adequate protein
- ✓ Lessen hunger
  - Unlimited F&V and extra protein help moderate hunger
- ✓ Skill building
  - Patients simultaneously develop skills for meal planning, shopping, and food preparation for long-term habit changes
- ✓ Transition to healthy homecooked meals
  - Reduce prepackaged meals and shakes after 6 weeks and incorporate healthy, homecooked supper meals



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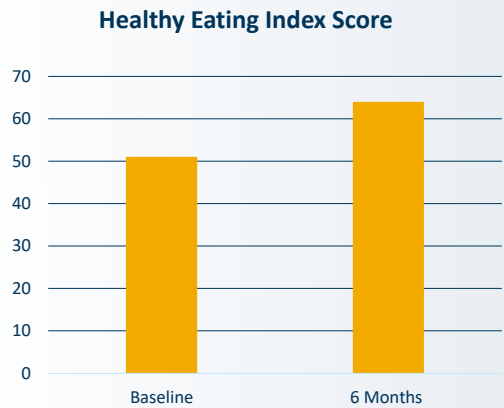
### Meal Replacements: 1 Year Weight Loss in Look AHEAD Study



Wadden et al., Obesity. Jan 2009

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### Meal Replacements Improve Diet Quality



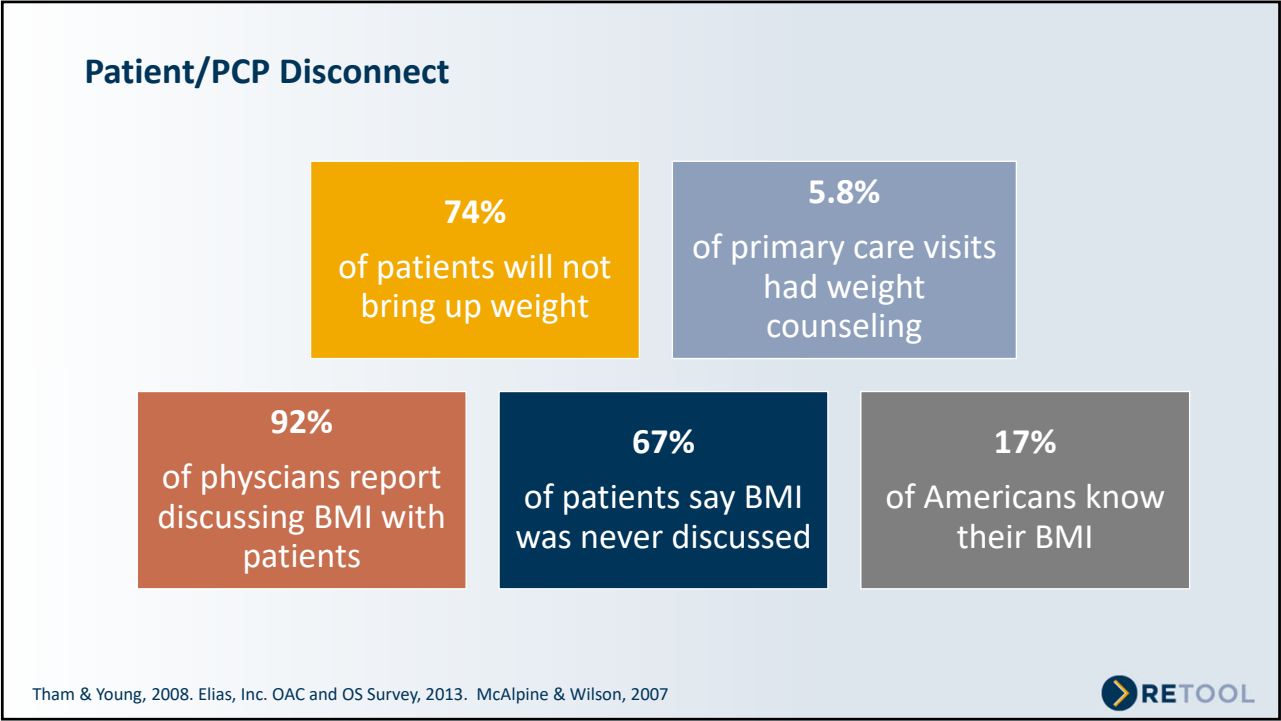
#### Significant Improvement With:

- ↑ Fruit
- ↑ Vegetables
- ↑ Protein
- ↑ Whole Grains
- ↑ Dairy
- ↓ Sodium
- ↓ Empty kcal
- ↓ Fat

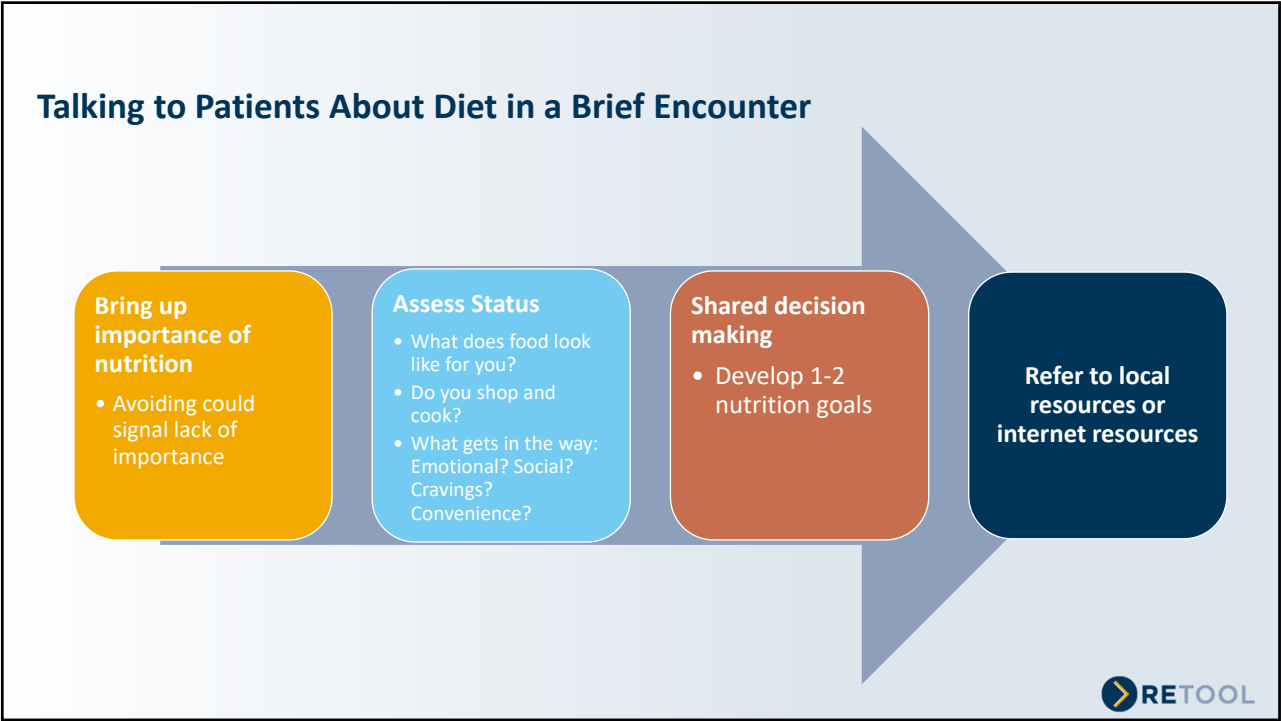
Christifano, Fazzino, Sullivan, Befort. *Nutr Cancer*, 2016.



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## RESOURCES

- Apps and websites
  - Noom
  - MyNetDiary
  - MyFitnessPal
  - My Plate
  - Paper trackers

[illegible]

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## Questions?

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