

# Diabetes and Popular Diets: What to Consider

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## Objectives

1. Describe popular diets and their potential impact on diabetes management.
2. Discuss helpful ways to communicate with patients regarding popular diets and when to refer to a dietitian.
3. Outline strategies for building a healthy diet for both weight management and diabetes.



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## Slide 2

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Hoskins, Shelby L, 2022-09-14T01:54:03.954

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## Popular Diets

Ketogenic Diet

Intermittent Fasting

Meal Replacements



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## Ketogenic Diet

- High in fat
- Moderate protein intake
- Very low carbohydrate intake

Often 5-10% of intake from carbohydrate --

With a 2000 kcal diet, carbohydrates could amount up to only 20-50 grams per day.



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### Slide 3

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## Ketogenic Diet – How it Works

Decrease in carb intake leads to falling glucose levels

Lipase releases stored triglycerides

Fatty acids travel to liver and ketones are produced

Ketones are released into bloodstream and used for energy

Body adapts to a new energy source



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## Ketogenic Diet – Clinical Significance

- Some research supports low-carbohydrate diets lead to significantly greater weight loss compared to low-fat interventions
- In a 2019 study conducted in Europe, 35 sedentary obese adults underwent a 12-week ketogenic diet.<sup>1</sup>

### Results:

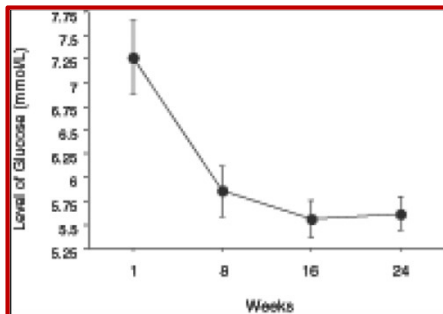
- Significant weight loss of participants ( $-18 \pm 9$  kg men vs.  $-11 \pm 3$  kg women;  $P < .001$ )
- Significant drop in glucose ( $P = .026$ ) in the first 2 weeks, then returned to baseline
- On the other hand, significant reduction in insulin ( $P < .001$ )



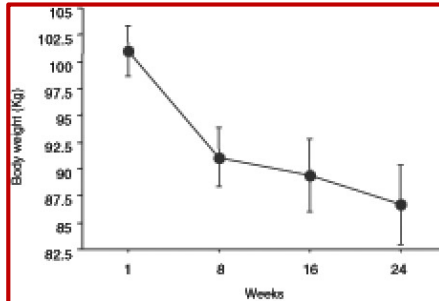
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## Ketogenic Diet – Clinical Significance

A prospective Kuwait study found that 83 obese patients following a 24-week ketogenic diet (30 grams carb per day) significantly decreased their weight and BMI at the 8th, 16th and 24th weeks ( $P < 0.0001$ )



Fasting blood glucose significantly decreased through the 16th week



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## Ketogenic Diet - Considerations

### Long-Term

- Low compliance
- Possible adverse effects: hepatic steatosis, hypoproteinemia, kidney stones and vitamin/mineral deficiencies

### Short-Term

- Keto flu: nausea, vomiting, headache, fatigue, dizziness, insomnia, limited exercise tolerance and constipation
- Social gatherings with food may be challenging

**Contraindications:** Pregnant or breast feeding, history of pancreatitis, liver failure, fat metabolism disorders or disordered eating.



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# Intermittent Fasting - History

- Prehistoric times, hunters and gatherers evolved to survive for long periods of time without eating
- For hundreds of years people have been fasting to cleanse and achieve a spiritual state (religious fasting)
- Using fasting and intermittent fasting to lose weight is a modern practice



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# Intermittent Fasting

- Alternate between periods of eating and fasting
- Two main types
  1. Time restricted eating
  2. Day fasting



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## Intermittent Fasting – Time Restricted

- ❖ Eating only during a specific window each day (eating windows can vary, often between 4-8 hours per day)
- ❖ No calories during fast
- ❖ Not constantly eating/grazing during eating window; maybe 2 meals and 2 light snacks

### 16:8

- Fast for 16 hours, eat during 8 hour time frame

### 18:6

- Fast for 18 hours, eat during 6 hour time frame

### OMAD (one meal a day)

- Eat one meal at 6PM and finish at 6:30PM



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## Intermittent Fasting – Day Fasting

- ❖ Eat very little a certain number of days per week (some calories allowed during fast)
- ❖ Do not fast 2 days in a row

### Alternate day fasting

- Eat normally one day and the next eat 25% of your normal calories

### 5:2

- Eat normally 5 days per week, fast 2 days per week (eat only 25% of your normal calories those 2 days)



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## Intermittent Fasting – How it Works

- Fasting forces the body to use up the “quick to burn energy”
- End up in ketosis
- Restricting eating causes hormones in the stomach, intestine and pancreas to change



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## Intermittent Fasting - Considerations

- Requires close attention to food choices emphasizing nutrient dense options



### **Contraindications:**

Pregnant or breastfeeding, malnourished/underweight and history of disordered eating.



- Could cause lower activity levels



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# Meal Replacement Programs



Meal replacements are drinks, bars, entrees, etc. that are used in place of eating a meal



Can help control calories and possibly promote weight loss



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# Meal Replacement Programs

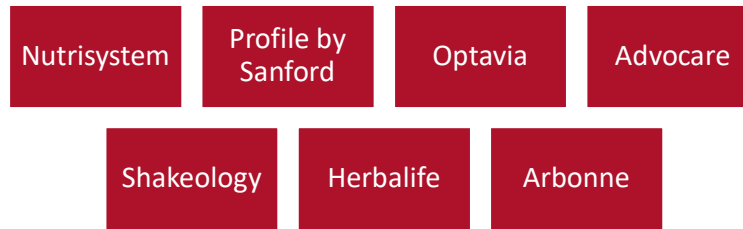


Medically supervised  
Screening process  
May have lab monitoring, regular  
visits/education  
Transition/maintenance phases to support  
success



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# Meal Replacement Programs



Independent distributors that often do not have medical supervision  
 Available online  
 May have health coaches - ? various backgrounds



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# Meal Replacement Programs



OTC options  
 May be used as meal replacement  
 Help supplement protein needs



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Body by Vi CHALLENGE

XYNBULAR

VISALUS SCIENCES

shakeology

MONA VIE

ISAGENIX

CAD ADVOCARE

ARBONNE INTERNATIONAL


HERBALIFE

USANA HEALTH SCIENCES

## Meal Replacement Comparison Chart

| Product              | Cost Per Serving   | Calories | Sugar (gr) | Carbs (gr) | Flavors | Fiber (gr) | Protein Type            | Sodium (mg) | Fat (gr) | Saturated Fat | Cholesterol (mg) |
|----------------------|--------------------|----------|------------|------------|---------|------------|-------------------------|-------------|----------|---------------|------------------|
| Xyngular Lean        | \$2.36 w/ shipping | 44       | 0          | 1.3        | 1       | 1.3        | a                       | 0           | 0        | 0             | 0                |
| Body By Vi Challenge | \$3.33             | 90       | <1         | 7          | 8+      | 5          | Proprietary Tri-Sorb    | 75          | 1        | None          | 15               |
| Shakeology           | \$4.00             | 150      | 9          | 17         | 2       | 3          | Whey                    | 100         | 1        | None          | 15               |
| Mona-vie             | \$3.00             | 190      | 7          | 29         | 2       | 6          | Proprietary Whey Blend  | 180         | 4        | Yes (1.5g)    | 40               |
| Isagenix             | \$3.22             | 231      | 14         | 28         | 2       | 7          | whey and casein protein | 200         | 6        | Yes (4g)      | 30               |
| Advocare             | \$2.85             | 220      | 12         | 24         | 3       | 5          | Whey Blend              | 80          | 3        | Yes (1g)      | 40               |
| Arbonne              | \$1.85             | 180      | 11         | 17         | 2       | 2          | Inner G-Plex & Protein  | 220         | 4        | None          | 0                |
| Herbalife            | \$2.00             | 93       | 9          | 9          | 6       | 2.5        | Soy                     | 140         | 3        | Yes (.5g)     | 0                |
| Usana                | \$3.67             | 230      | 19         | 33         | 4       | 3          | Whey Blend              | 260         | 6        | Yes (1g)      | 10               |

\*LEAN Proprietary Protein Blend: Soy Protein 90%, Isolate Soy Milk Powder, Whey Protein Concentrate (80% Whey Protein)



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## Meal Replacements - Considerations

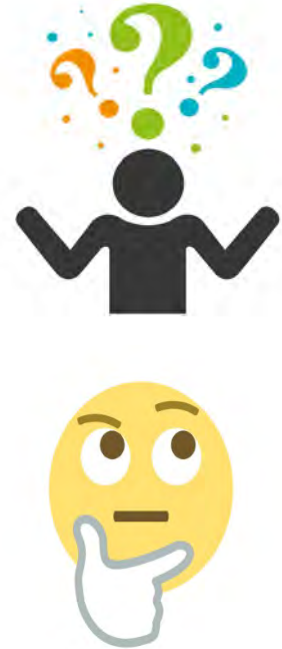
- ❖ Suitable for those with a busy lifestyle
- ❖ Costly, often not covered by insurance
- ❖ Low compliance
- ❖ Need to pay close attention
  - ❖ Nutrition and quality of products varies greatly



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# Diabetes and Popular Diets



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## Ketogenic Diet

- Low carb
- Protein
- Fat

### SGLT-2 Inhibitors

**Canagliflozin (Invokana), Empagliflozin (Jardiance), Dapagliflozin (Farxiga) and Ertugliflozin (Steglatro)**

- Discontinue if initiating a strict low carb diet
- Increased risk for euglycemic DKA
  - Educate on signs and symptoms of DKA

**CAUTION**

### GLP-1 RA

**Liraglutide (Victoza), Dulaglutide (Trulicity), Exenatide (Bydureon/Byetta), Semaglutide (Ozempic) and Tirzepatide (Mounjaro)**

- Glucose-dependent, diet is contradictory
- Consider possible adverse side effects along with a high fat diet

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## Slide 21

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**HLO** Shelby takes over here  
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# Ketogenic Diet

- 
- Low carb
- Protein
- Fat

|   |  |   |
|---|--|---|
| <p style="text-align: center;"><b>Sulfonylureas</b></p> <p style="color: red; font-weight: bold;">Glyburide (Diabeta), Glipizide (Glucotrol), Glimepiride (Amaryl)</p> <ul style="list-style-type: none"> <li>▪ Increased risk for hypoglycemia</li> <li>▪ Discontinue or make dose adjustment</li> </ul>  | <p style="text-align: center;"><b>Meglitinides</b></p> <p style="color: red; font-weight: bold;">Repaglinide (Prandin), Nateglinide (Starlix)</p> <ul style="list-style-type: none"> <li>• Increased risk for hypoglycemia</li> <li>• Discontinue or make dose adjustment</li> </ul> | <p style="text-align: center;"><b>Insulin</b></p> <p style="color: red; font-weight: bold;">Basal, Bolus, Concentrated and Inhaled insulins</p> <ul style="list-style-type: none"> <li>▪ Increased risk for hypoglycemia</li> <li>▪ Dose adjustment to account for lower carb intake</li> <li>▪ More frequent communication with provider managing insulin</li> </ul> |
|---|--|---|

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# Intermittent Fasting

- 
- Reduced caloric intake
- No change in macronutrient distribution
- Duration of fast varies

|  |  |
|--|--|
| <p style="text-align: center;"><b>Sulfonylureas</b></p> <p style="color: red; font-weight: bold;">Glyburide (Diabeta), Glipizide (Glucotrol), Glimepiride (Amaryl)</p> <ul style="list-style-type: none"> <li>• Increased risk for hypoglycemia</li> <li>• May need to adjust dose or timing of medication</li> <li>• Depending on duration of fast may need to be discontinued</li> </ul> | <p style="text-align: center;"><b>Insulin</b></p> <p style="color: red; font-weight: bold;">Basal, Bolus, Concentrated and Inhaled insulins</p> <ul style="list-style-type: none"> <li>▪ Increased risk for hypoglycemia</li> <li>▪ Doses may need to be adjusted</li> </ul> |
|--|--|

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# Meal Replacements

- Macronutrient distribution varies
- Reduced caloric intake


|  |  |   |
|--|--|---|
| <b>SGLT-2 Inhibitors</b><br>Canagliflozin (Invokana), Empagliflozin (Jardiance), Dapagliflozin (Farxiga) and Ertugliflozin (Steglatro) <ul style="list-style-type: none"> <li>Discontinue if MR plan is overall low in carbohydrate</li> </ul> | <b>Insulin</b><br>Basal, Bolus, Concentrated and Inhaled insulins <ul style="list-style-type: none"> <li>May need adjusted based on structure of program and carbohydrate content</li> </ul> | <b>Sulfonylureas</b><br>Glyburide (Diabeta), Glipizide (Glucotrol), Glimepiride (Amaryl) <ul style="list-style-type: none"> <li>Increased risk for hypoglycemia if MR plan is low in carbohydrate</li> <li>Discontinue or lower dose</li> </ul> |
|--|--|---|

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# Limit adverse events




Education




Ask about diet changes



Increased monitoring



Refer to CDCES RN or dietitian



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## Popular Diets

### Disadvantages

- Too restrictive
- May lead to nutritional deficiencies
- Typically, not sustainable
- Potentially harmful for some

### Advantages

- Increased awareness
- Mindfulness
- Understanding food labels



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## Building a Healthy Diet for Diabetes

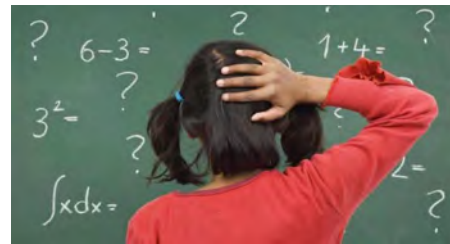


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## Phrases to avoid

"Eat less carbs" ----> patient take away "I can't have carbs"

"Just **count** your carbs"----> patient take away "I can't have carbs"



"I don't count calories or carbs.  
Dieting is hard enough without math!"

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## Questions to help provide insight

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Where did you learn about this diet?

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How would you describe your diet?

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How have you felt on this diet?

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What about this diet appeals to you?

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Do you feel you can sustain this diet longer than 30 days?

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Have you ever received diabetes diet education?

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# Dietitian Referral

- ❖ Desire to better manage disease through diet
- ❖ Following a new diet
- ❖ Inability to maintain weight loss/gain
- ❖ No prior diet-related diabetes education
- ❖ Multiple health conditions



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# Nutrition Assessment

- |                   |                           |
|-------------------|---------------------------|
| ▪ Diet history    | ▪ Weight management goals |
| ▪ Medical history | ▪ Activity/Fitness        |
| ▪ Social history  | ▪ Access to food          |
| ▪ Medications     | ▪ Numeracy skills         |
| ▪ Labs            | ▪ Health literacy         |
| ▪ Weight history  | ▪ Motivation/Barriers     |



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# Eating Patterns

Highlighted from ADA 2022  
Guidelines:

- Mediterranean-style
- Low-carbohydrate
- Vegetarian or plant-based
- Low-Fat diet
- DASH diet

Emphasize  
non-  
starchy  
vegetables

Minimize  
intake of  
added  
sugars and  
refined  
grains

Stress  
whole  
foods over  
ultra  
processed  
foods



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# Balanced Diet Benefits



## Fat

Satiety

Aids in absorption of essential  
fat soluble vitamins

Slows down carbohydrate  
absorption



## Protein

Satiety

Boost metabolism

Reduces muscle loss

Maintain a healthy weight



## Carbohydrates (fiber rich)

Satiety

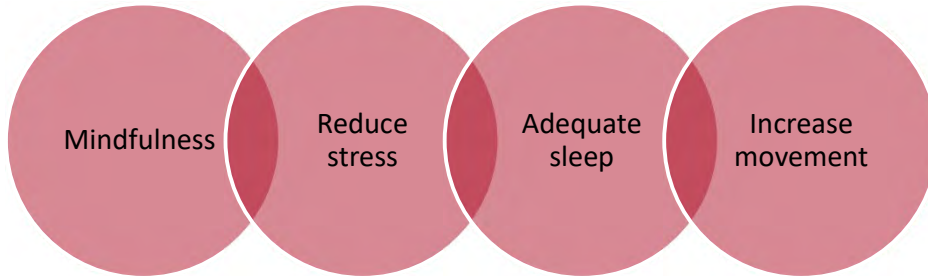
Blood sugar regulation

Healthy digestion

Maintain a healthy weight

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# Lifestyle Approach



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# Slow and steady wins the race!

| Increase  | Reduce  | Reduce  | Ask   | Add   | Keep  |
|---|---|---|---|---|---|
| Increase daily steps by 200 this week   | Reduce soda intake from 1 bottle to 1 can per day                                   | Reduce take-out from 3 days per week to 2 days per week                             | Ask yourself if truly hungry before your snack                                      | Add 1 vegetable at dinner   | Keep a water bottle at home and at work   |
|  |  |  |  |  |  |



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## References

1. Mohorko N, Černelič-Bizjak M, Poklar-Vatovec T, Grom G, Kenig S, Petelin A, Jenko-Pražnikar Z. Weight loss, improved physical performance, cognitive function, eating behavior, and metabolic profile in a 12-week ketogenic diet in obese adults. *Nutr Res.* 2019 Feb;62:64-77. doi: 10.1016/j.nutres.2018.11.007. Epub 2018 Nov 12. PMID: 30803508.
2. Dashti HM, Mathew TC, Hussein T, Asfar SK, Behbahani A, Khoursheed MA, Al-Sayer HM, Bo-Abbas YY, Al-Zaid NS. Long-term effects of a ketogenic diet in obese patients. *Exp Clin Cardiol.* 2004 Fall;9(3):200-5. PMID: 19641727; PMCID: PMC2716748.
3. American Diabetes Association Professional Practice Committee; American Diabetes Association Professional Practice Committee; Draznin B, Aroda VR, Bakris G, Benson G, Brown FM, Freeman R, Green J, Huang E, Isaacs D, Kahan S, Leon J, Lyons SK, Peters AL, Prahalad P, Reusch JEB, Young-Hyman D. 5. Facilitating Behavior Change and Well-being to Improve Health Outcomes: Standards of Medical Care in Diabetes-2022. *Diabetes Care.* 2022 Jan 1;45(Suppl 1):S60-S82. doi: 10.2337/dc22-S005. PMID: 34964866.



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