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S3 Clinical nutrition

New diabetes nutrition therapy guidelines:
the evidence and controversies - focus on macronutrients

NEW diabetes nutrition therapy guidelines

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POSITION STATEMENT

Nutrition Recommendations and Interventions for Diabetes

A position statement of the American Diabetes Association

AMERICAN DIABETES ASSOCIATION

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POSITION STATEMENT

Nutrition Therapy Recommendations for the Management of Adults With Diabetes

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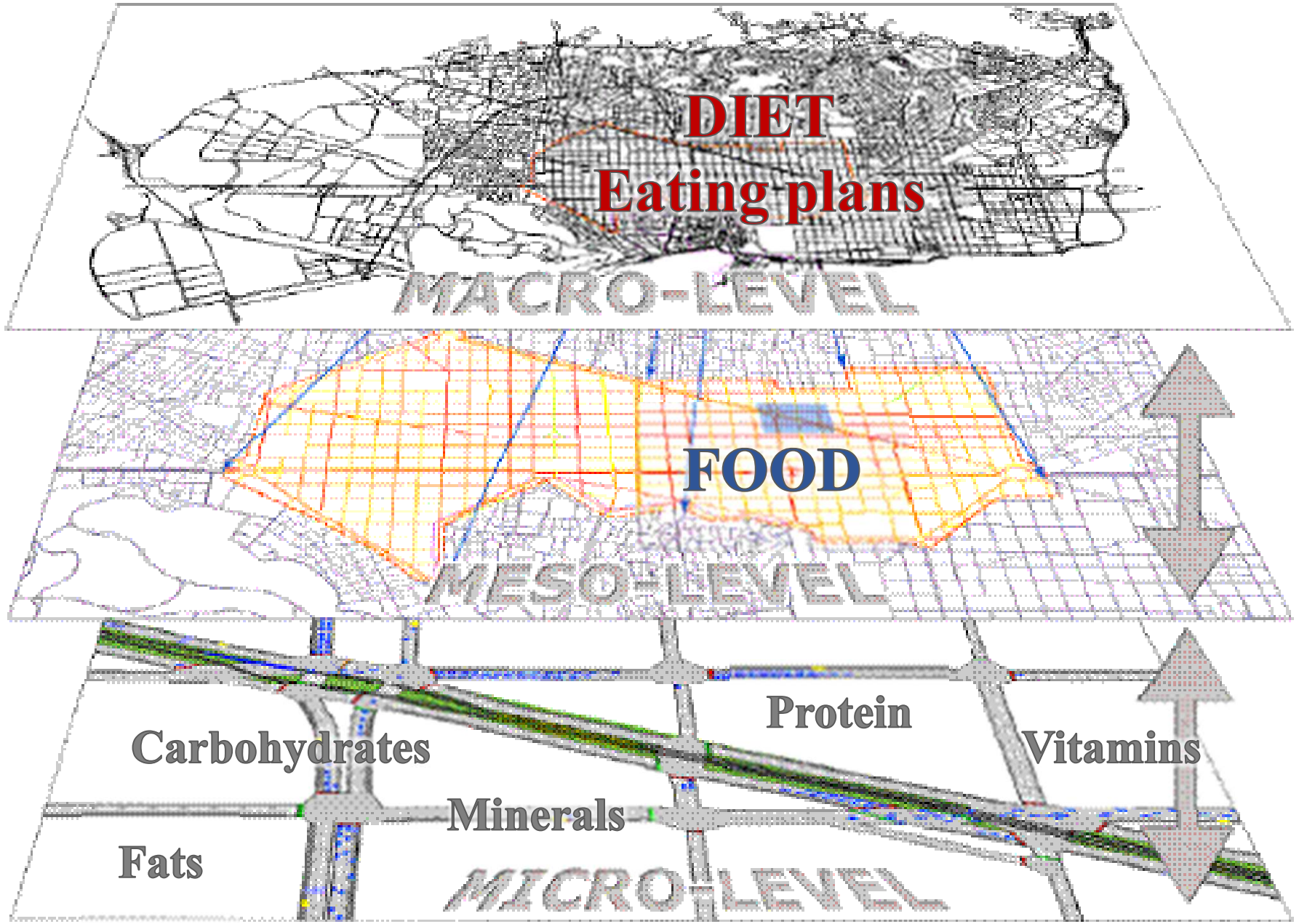
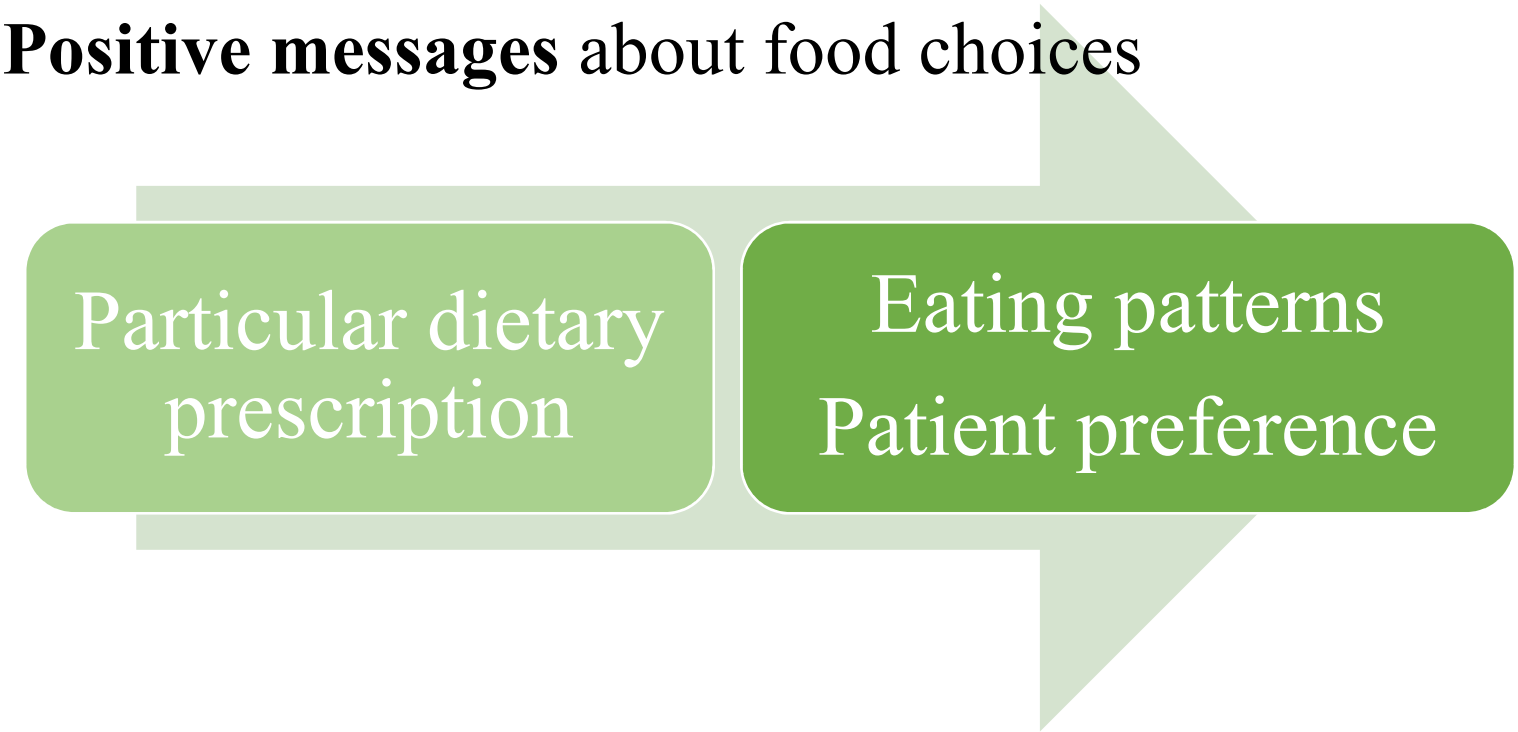

DIET
Eating plans
MACRO-LEVEL
FOOD
MESO-LEVEL
Protein
Carbohydrates
Vitamins
Minerals
Fats
MICRO-LEVEL

Overarching message

- **Individualization**
  - There's not a one-size-fits-all eating pattern for individuals with diabetes.
- **Positive messages** about food choices



‘One Size Does Not Fit All’

- **Respect for their cultural heritage** (to keep favorite dishes in the plan)
- **Eating plan**
  - Minimally processed, nutrient-dense foods
  - Appropriate portion sizes
  - Takes into account individual preferences, cultures, religious beliefs, traditions, and metabolic goals
- **Individualized nutrition therapy** is best for diabetes patients

Goals of nutrition therapy

- To promote and support healthful eating patterns
- To address individual nutrition needs based on personal and cultural preferences, etc.
- To maintain the pleasure of eating
- To provide the individual with diabetes with practical tools for day-to-day meal planning

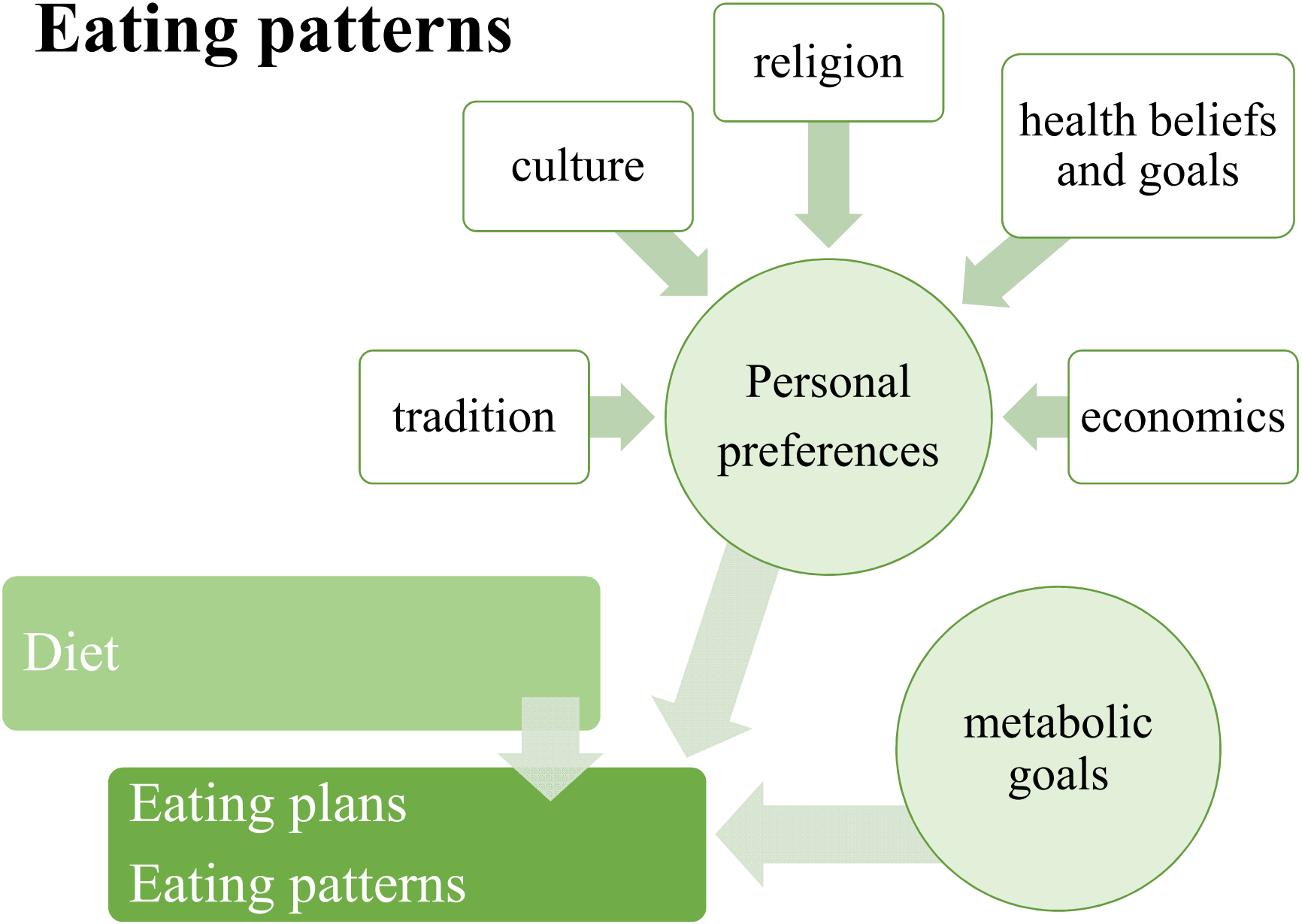
Energy balance

- **Overweight/obese adults with type 2 diabetes**
  - For weight loss: reducing energy intake while maintaining healthful eating pattern
  - Optimal macronutrient intake to reduce weight not established
- **Modest weight loss** may improve glycemia, BP, lipids
  - Particularly early in disease process
- **Recommended for modest weight** loss
  - Intensive lifestyle interventions: nutrition therapy counseling, physical activity, behavior change
  - Ongoing support

Optimal mix of macronutrients

- NOT an ideal percentage of calories from carbohydrate, protein, or fat for all people with diabetes
- Macronutrient distribution should be based on individualized assessment of
  - Current eating patterns
  - Preferences
  - Metabolic goals

Eating patterns



Eating patterns

Consider personal preferences and metabolic goals when recommending an eating pattern.	
DASH	High in fruits, vegetables, low-fat dairy, whole grains, poultry, fish, nuts. Low in saturated fat, red meat, sweets, ontaining beverages, sodium.
Low carbo	tein, fat; veggies low in carbs. rains avoided
Low fat	low-fat dairy.Total fat at intake <10%
Mediterranean style	Abundant pl onal foods. Fruit as desse e oil primary fat. Low to moderat wine (with meals).
Vegan	No flesh foods or animal products
Vegetarian	No flesh foods; includes eggs and/or dairy

There is no "ideal" conclusive eating pattern that is expected to benefit all individuals with diabetes.

Carbohydrates

- **Collaborative goals** with patient
  - Ideal carb amount not established
- **Amount of carbs** and **available insulin** is important factors influencing postprandial glycemic response; consider when developing eating plan
- **Monitor carb intake** to achieve glycemic control
- Carb intake from **vegetables, fruits, whole grains, legumes, and dairy products**
  - Avoid other carb sources, esp. those with added fats, sugar, or sodium

High or Low Carb?

- **NO** conclusive evidence regarding an **ideal amount** of carbohydrate intake for people with diabetes

2008	2013
▪ a minimum carbohydrate intake of 130 g/day	▪ none

- Emphasis on **where the carbohydrates come from**
  - Whatever carbohydrates are eaten should come from **vegetables, whole grains, fruits, legumes, and dairy products** over other sources that contain added fats, sugar, or sodium.

Quality of carbohydrates

- **Glycemic index and glycemic load**
  - Substituting low-glycemic load foods for higher-glycemic load foods
  - Modestly improve glycemic control
- **Dietary fiber and whole grains**
  - People with diabetes should consume at least the amount of **fiber** and **whole grains** recommended for the general public.

Fiber

- No longer hold as much weight
  - Unrealistic (requires fiber intakes of more than 50 g/day)
- Recommendations for the general public
- **Dietary fiber**: consume at least
  - 14 g fiber/1,000 kcals/day
  - 25 g/day for women, 38 g/day for men
- **Whole grains**: consume at least
  - ≥50% of all grains as whole grains

Sucrose, Fructose, Caloric sweeteners

- **Minimize sucrose intake** when substituting for starch
  - Avoid displacing nutrient-dense foods
- **Free fructose (naturally occurring)**
  - Result in better glycemic control compared with isocaloric intake of sucrose or starch
  - Unlikely to have detrimental effects on triglycerides as long as intake is not excessive (>12% energy)
- **Limit/avoid sugar-sweetened beverages (SSBs)**
  - Reduce risk for weight gain and worsening of cardiometabolic profile

Nonnutritive sweeteners (NNSs)

- The use of **nonnutritive sweeteners (NNSs)** could potentially **reduce overall calorie and carbohydrate intake** if substituted for caloric sweeteners without compensation by eating additional calories from food sources.
- **Not enough evidence** to determine whether NNS use actually leads to reduction in body weight or reduction in cardiometabolic risk factors
- **Artificial sweeteners / Natural sweeteners**

Protein

Diabetes without diabetic kidney disease	• **No** ideal intake to improve glycemic control or CVD risk • Goals individualized
Diabetes and diabetic kidney disease (either micro- or macro-albuminuria)	• Reducing the amount of dietary protein below the usual intake is **not** recommended
Type 2 diabetes	• Carb sources high in protein should not be used to treat or prevent hypoglycemia.

Fat Quality trumps Quantity

- Evidence is **inconclusive** for an ideal amount of **total fat intake** for people with diabetes.
- Goals should be **individualized**.
- Research suggests that **fat quality** appears to be far more important than **quantity**.
  - "Dietary cholesterol and saturated fat aren't the dietary villains we once thought"
  - "A diet of diversity with **high-quality sources** of saturated fat, such as coconut, coconut oil, and grass-fed animal foods, are acceptable and amounts in the diet should be **individualized**."

Fat

- People with diabetes should follow **the same guidelines** for saturated fat, trans fat, and cholesterol as the general population.

	2008	2013
Saturated fat	< 7%	< 10%
Cholesterol	< 200 mg/day	< 300 mg/day
Trans fat	minimized	limited as possible

- People with type 2 diabetes may benefit from following a Mediterranean-style, monounsaturated fatty acid-rich eating pattern.

MUFAs / PUFAs

- **MUFAs**
  - In type 2 diabetes, **a Mediterranean-style, MUFA-rich eating pattern** may benefit glycemic control and CVD risk factors.
  - Recommended as an effective alternative to a lower-fat, higher-carb. eating pattern.
- **PUFAs**
  - **Limited evidence** on the effects in diabetes
  - **Controversy** on the best ratio of omega-6 to omega-3 fatty acids
- PUFAs and MUFAs are recommended substitutes for saturated or *trans* fat.

Omega-3 fatty acids

- **Omega-3 (EPA & DHA) supplements** is **NOT** recommended for the prevention or treatment of CV events in diabetes.
- **Increase in foods containing long-chain omega-3 FAs (EPA & DHA) (from fatty fish) and omega-3 ALA** is recommended.
  - Beneficial effects on lipoproteins, prevention of heart disease
  - Associations with positive health outcomes
- **Eat fish (particularly fatty fish) ≥2 times/week**

Micronutrients

- Routine supplementation with **antioxidants**, such as vitamins E and C and carotene, is not advised.
- There was insufficient evidence to support the routine use of **micronutrients** such as **chromium, magnesium, and vitamin D** to improve glycemic control in people with diabetes.
- Some disagrees with the vitamin D recommendations: “There’s a plethora of very good evidence that supports the use of vitamin D in individuals with diabetes.”

Vitamins

- Remains essentially the same
- There’s no clear evidence of benefit from vitamin or mineral supplementation in individuals without underlying deficiencies.

Herbs

- There is insufficient evidence to support the use of **cinnamon or other herbs/supplements** for the treatment of diabetes.
  - Herbal products aren't standardized.
  - The potential to interact with other medications.

Alcohol

- **Daily moderation**
  - Women: ≤1 drink/day
  - Men: ≤2 drinks/day

    cf. 1 drink = 12 oz beer, 5 oz wine, or 1.5 oz distilled spirits, each containing approximately 15 g of alcohol
- **Alcohol consumption may increase risk for delayed hypoglycemia**
  - Especially if taking insulin or insulin secretagogues
  - Education and awareness regarding the recognition and management of delayed hypoglycemia

Sodium

- People with diabetes follow the same guidelines (**less than 2,300 mg/day**) as the general population.
- For individuals with **both diabetes and hypertension**, further reduction in sodium intake be **individualized**.
- **Consideration** be given to palatability, availability, and additional cost of **specialty low-sodium products** and the difficulty in achieving both low-sodium recommendations and a nutritionally adequate diet.

Clinical priorities for nutrition : All people with diabetes

- Recommend portion control for weight loss & maintenance
- Know what foods contain carbohydrates
  - Starchy veggies, whole grains, fruit, milk/milk products, veggies, sugar
- Choose nutrient-dense, high fiber foods over processed foods
- Avoid sugar-sweetened beverages
- Carb counting: usually no need to subtract fiber, sugar alcohols from total carbohydrates
- High *trans* or saturated fat foods: Substitute foods higher in unsaturated fats (liquid oils)
- Select leaner protein sources and meat alternatives
- Vitamin and mineral supplements, herbal products, or cinnamon not recommended to manage diabetes
- Moderate alcohol consumption
- Limit sodium intake to 2,300 mg/day

Clinical priorities for nutrition : By medication

Insulin secretagogues (sulfonylureas, meglitinides)	▪ Moderate amounts of carbohydrate at each meal and snacks ▪ To reduce risk of hypoglycemia: •Eat a source of carbohydrates at meals •Moderate amounts of carbohydrates at each meal and snacks •Do not skip meals •Always carry a source of carbohydrates during physical activity
Metformin	▪ Gradually titrate to minimize GI S/Es when initiating use: •Take with food or 15 min after a meal if symptoms persist •If side effects do not resolve over time (a few weeks), HCP F/U •If taking along with an insulin secretagogue or insulin, may experience hypoglycemia.

Clinical priorities for nutrition : By medication

α-glucosidase inhibitors	▪ Gradually titrate to minimize GI S/Es when initiating use ▪ Take at start of meal to have maximal effect: •If taking along with an insulin secretagogue or insulin, may experience hypoglycemia. •If hypoglycemia occurs, eat something containing monosaccharides such as glucose tablets as drug will prevent the digestion of polysaccharides.
Incretin mimetics (GLP-1 receptor agonists)	▪ Gradually titrate to minimize GI S/Es when initiating use •Injection of daily or twice-daily GLP-1s should be premeal. •If S/Es do not resolve over time (a few weeks), HCP F/U. •If taking along with an insulin secretagogue or insulin, may experience hypoglycemia. •Once-weekly GLP-1s can be taken at any time during the day regardless of meal times

Clinical priorities for nutrition : T1DM & Insulin-requiring T2DM

Count carbs or use meal planning to quantify carb intake: to "match" mealtime insulin to carbs consumed	
Multiple-daily injection plan or insulin pump	• Take mealtime insulin prior to eating • Meals can be consumed at different times • If physical activity is performed within 1-2 h of mealtime insulin injection, this dose may need to be lowered to reduce risk of hypoglycemia
Premixed insulin plan	• Take insulin dose at consistent times every day • Meals at similar times every day • Do not skip meals to reduce risk of hypoglycemia • Always carry a source of quick-acting carbohydrates during physical activity
Fixed insulin plan	• Eat similar amounts of carbohydrates each day to match the set doses of insulin

Summary

No standard meal plan or eating pattern that works universally for all persons with diabetes	
Nutrition therapy should be individualized based on	• Individual health goals • Personal and cultural preferences • Health literacy and numeracy • Access to healthful choices • Readiness, willingness, and ability to change
Nutrition interventions should	• Emphasize a variety of minimally processed nutrient-dense foods in appropriate portion sizes as part of a healthful eating pattern • Provide the individual with diabetes with practical tools for day-to-day food plan and behavior change that can be maintained over the long term