Nutrition Therapy Recommendations in Diabetes

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No disclosures

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Learning Objectives

Using the 2022 Standards of Medical Care in Diabetes

1. Identify at least 2 Nutrition Therapy Goals for Adults with Diabetes.
2. Identify the 4 critical times that a person with diabetes should be referred for individualized Medical Nutrition Therapy with a Registered Dietitian.
3. Describe three broad characteristics of a healthy eating pattern that all health care professionals should suggest to those with diabetes.

(Evidence Grade)

Notes: unless otherwise stated, all guidelines are from “Facilitating Behavior Change and Well-Being to Improve Health Outcomes: Standards of Medicare Care in Diabetes – 2022, pages S60-S67

Abbreviations:
EP = Eating Plan or Eating Pattern
MP= Meal Plan
DGA = Dietary Guidelines for Americans
DM = Diabetes Mellitus
DSMT = Diabetes Self-Management Training
ICR – Insulin to carb ratio
RD/RDN = Registered Dietitian/Nutritionist
SMBG = Self-monitoring blood glucose
CGM = Continuous Glucose monitoring
PWD = People with Diabetes
PP = Post Prandial

One Size…

Does

Not

Fit

All

Individualized Meal Planning

Each person with DM should have the collaborative development of an ***Individualized*** Eating Plan (EP) with an RD/RDN

(Evidence Grade A)

Medical Nutrition Therapy (MNT)

PWD should be referred for MNT (and DSMT)

- At dx
- Annually or when not meeting targets
- When complicating factors interfere
- At transitions in life

MNT with and RD/RDN

- Associated with A1c absolute A1c reduction of

1.0-1.9%
(Type 1 DM)

0.3-2.0%
(Type 2 DM)

Goal 1: Promote/Support Healthy EP

- **Nutrient Dense Foods**
- Appropriate Portions
- Achieve or maintain body weight goals
- Attain individualized glycemic, blood pressure and lipid goals
- Delay or prevent complications

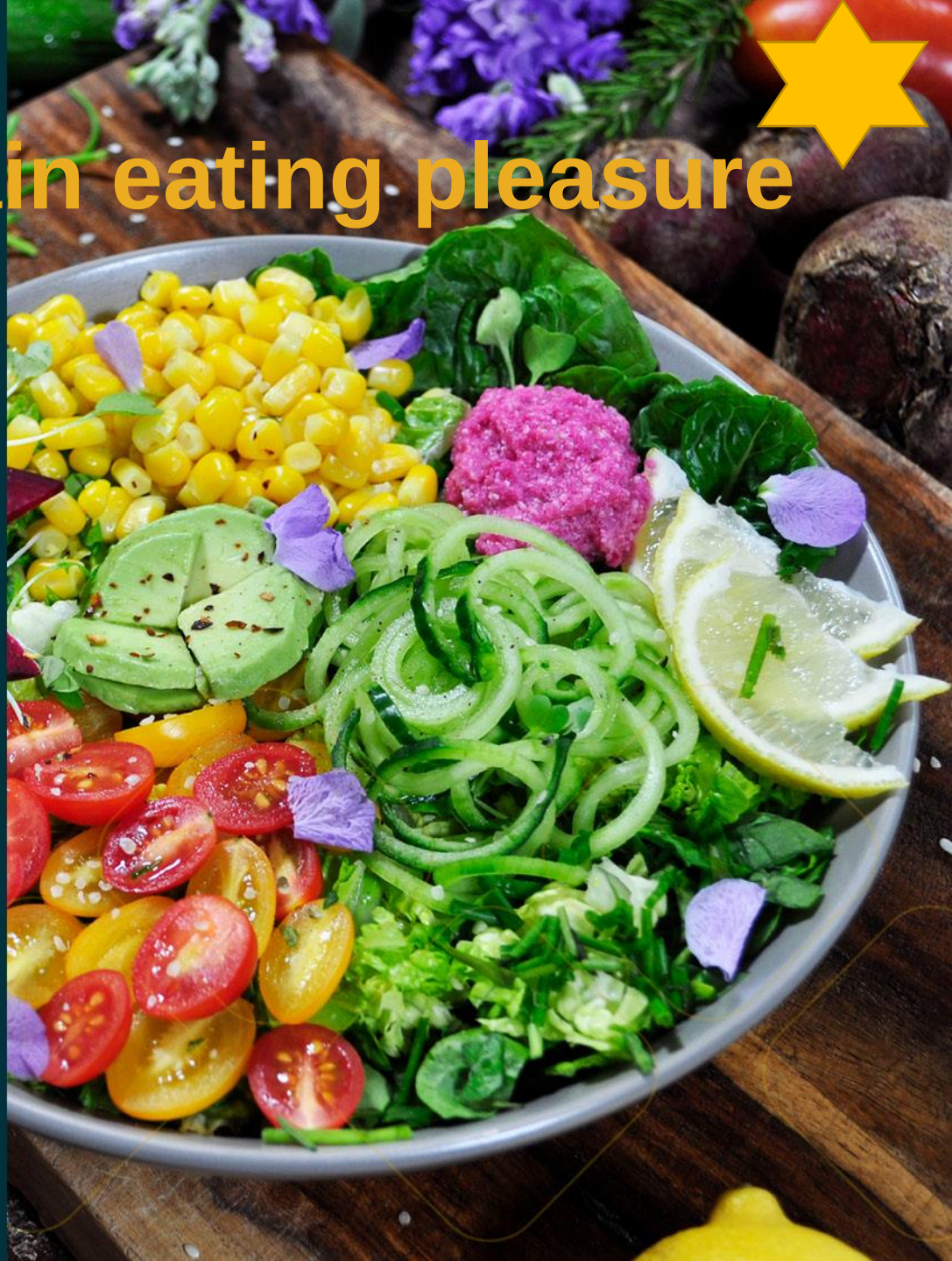
Goal 2: Address Individual Needs

Current Eating Pattern, Personal Preferences, Culture, Traditions, Religious Beliefs, Health Beliefs, Health Goals, Access to Healthy Food, Food Literacy & Food Skills, Numeracy Skills, Physical limitations, Health Status, Ability to sustain EP	**Metabolic Goals Medications**

Goal 3: Maintain eating pleasure

Nonjudgmental messages about food choices

Limit food choices only when indicated by scientific evidence



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Goal 4: Provide practical tools

- For developing overall *healthy eating pattern* rather than focus on individual macronutrients, micronutrients, food groups or single foods.

(People rarely eat foods in isolation)

Weight Management

- ≥ 5% loss with overweight/obesity (A)
- Emphasize energy deficit w/ ⇧ in PA
- A variety of eating plans with variable macronutrient composition are effective & safe for wt loss in the short-term (1-2 years)
- Ex: Low calorie w/meal replacement drinks, Mediterranean style, low carb meal plans with additional support

Weight Management

- No single diet consistently superior in studies
- More data needed to validate long-term outcomes & patient acceptability

Cannot overemphasize

- Importance of guidance on Individualized MP w/ nutrient-dense foods-vegetables, fruits, legumes, dairy, lean sources of protein (plant-based, lean meats, fish, poultry), nuts, seeds, whole grains, with an energy deficit

Macronutrient Distribution - DM

No ideal % of calories from Carb Protein Fat (Evidence Grade E)	Individualize-Consider Current patterns Patient preferences Total Calories Metabolic goals

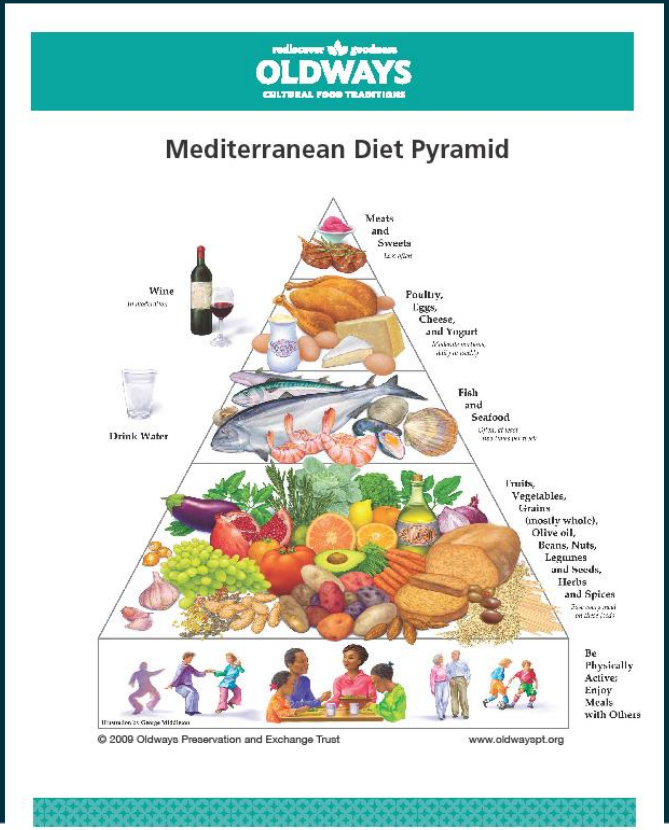
Healthy Eating Patterns

- Examples: Mediterranean, low carb and vegetarian or plant-based and all have shown positive outcomes in T2 DM but individualize
- Inadequate research

in T1 DM to support one

EP over another

Teaching tool from https://oldwayspt.org/system/files/atoms/files/MedDiet Pyramid_flyer%5B1%5D_0.pdfe



Healthy Eating – Key Factors

Many are acceptable (B) but emphasize

↑Non-starchy Vegetables

↓added sugar, refined grains

Choose Whole foods over Processed

As much as possible

Eating Patterns for Diabetes

Reduced Carb Intake

- Has the most evidence for improving glycemia (B)

- Can be applied to a variety of EP that meet individual needs & preferences

2 Common Meal Planning Approaches

Two MP found in RCT as effective to help improve A1c, especial if A1c is 7-10%

Diabetes Plate-visual approach

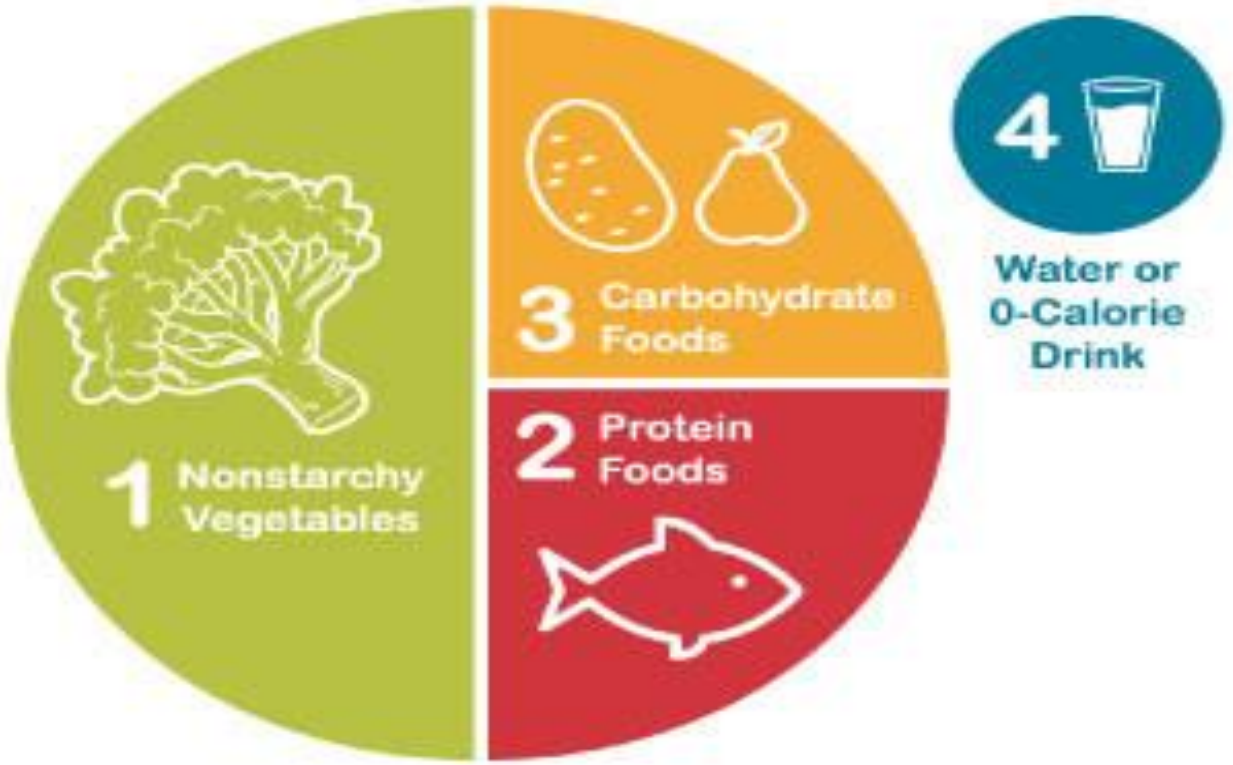
9” plate

1/2 as Non-starchy vegetables

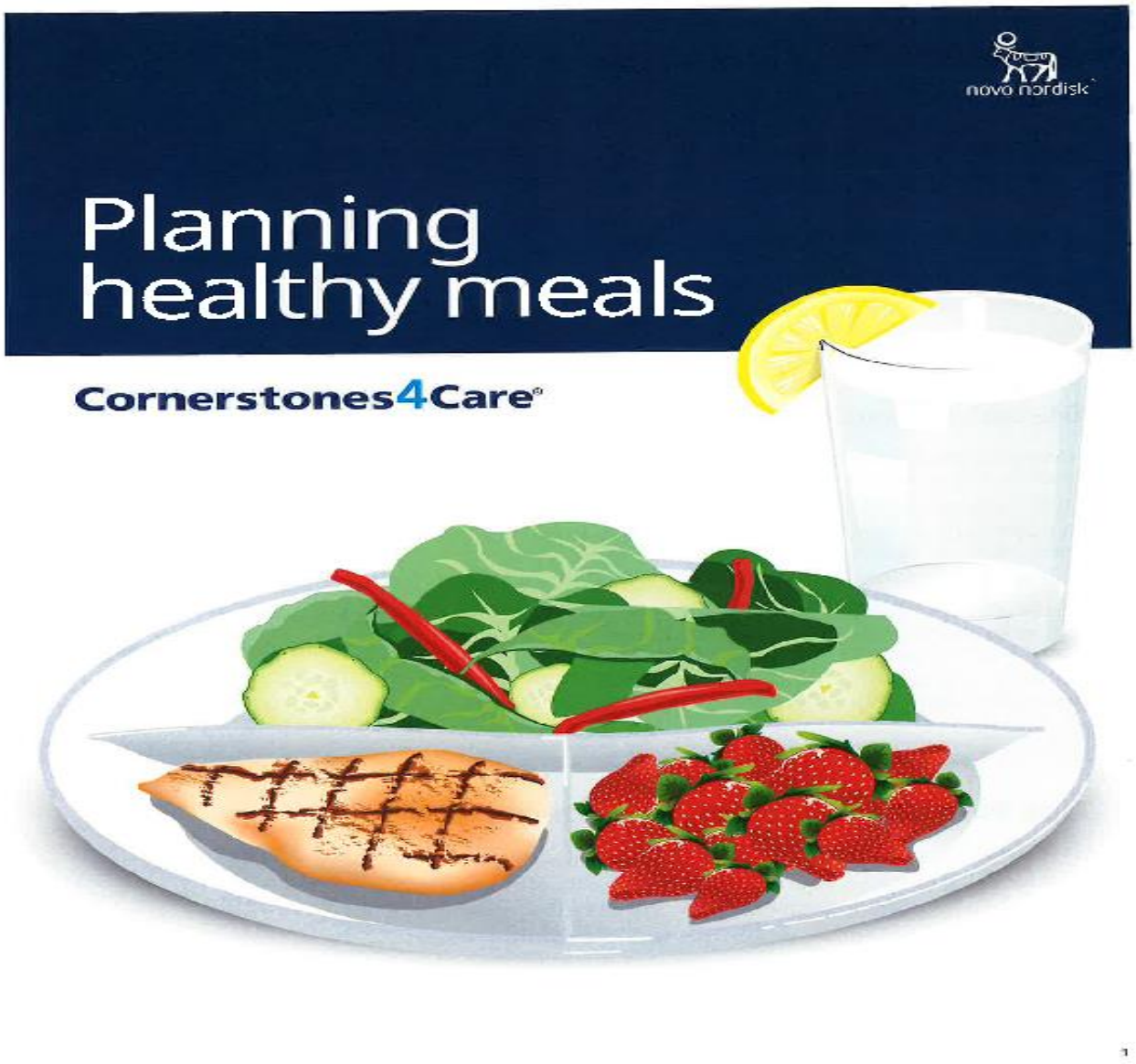
¼ plate as protein

¼ plate as carbs

Diabetes Plate



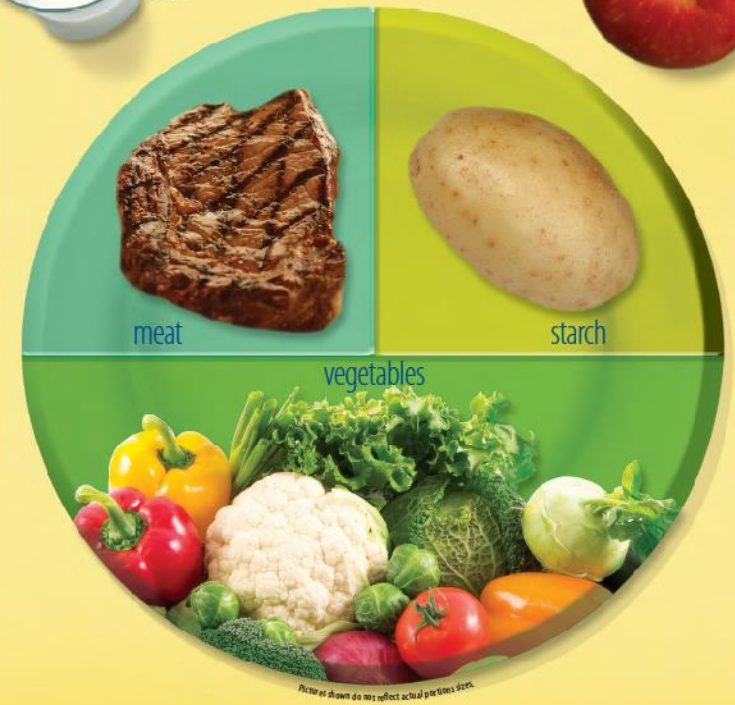
https://diabetes.org/sites/default/files/inline-images/AtE_plate-method-vector_1787742770.jpg



Teaching tool from Novo Nordisk

https://www.novomedlink.com/content/dam/novonordisk/novomedlink/new/diabetes/patient/disease/library/documents/planning-healthy-meals.pdf

Diabetes Nutrition Placemat



Portion Sizes

SERVING		
1 oz.	=	1 thumb
3 oz.	=	size of a deck of cards
1 cup	=	a fist
1 tsp.	=	a thumb tip
¼ cup	=	a golf ball
2 Tbsp.	=	a large marshmallow
1 oz.	=	4 dice

*SEE BACK FOR PORTION EXAMPLES

nova Max

Live Life to the Max!

Lifestyle Activities

30 MINUTES of Activity	Your weight 150 lbs Calories Burned	Your weight 200 lbs Calories Burned
Baseball, playing catch	85	113
Basketball, shooting baskets	153	204
Bicycling – moderate	272	363
Bowling	102	136
Dancing	153	204
Gardening	136	181
Golf – riding in cart	119	159
Pushing baby stroller	85	113
Running 5 mph (12 min. per mile)	272	363
Swimming, leisure, no laps	204	272
Tai Chai	136	181
Vacuuming	119	159
Washing car	102	136
Walking a dog	102	136
Walking 3 mph (20 min. per mile)	109	145
Yoga	85	113

Did you know*

		Added Calories
1 scoop vanilla ice cream (10% fat)	=	100
1 chocolate chip cookie	=	110
1 package potato chips	=	150
1 cafe latte with skim milk (12 oz.)	=	180
1 donut – glazed	=	250
1 slice of chocolate cake with frosting (3 oz.)	=	320
1 brownie (3 ½ oz.)	=	420

*Ask your CDE how to fit these foods into your nutrition & exercise plan.

My Diabetes Educator _____

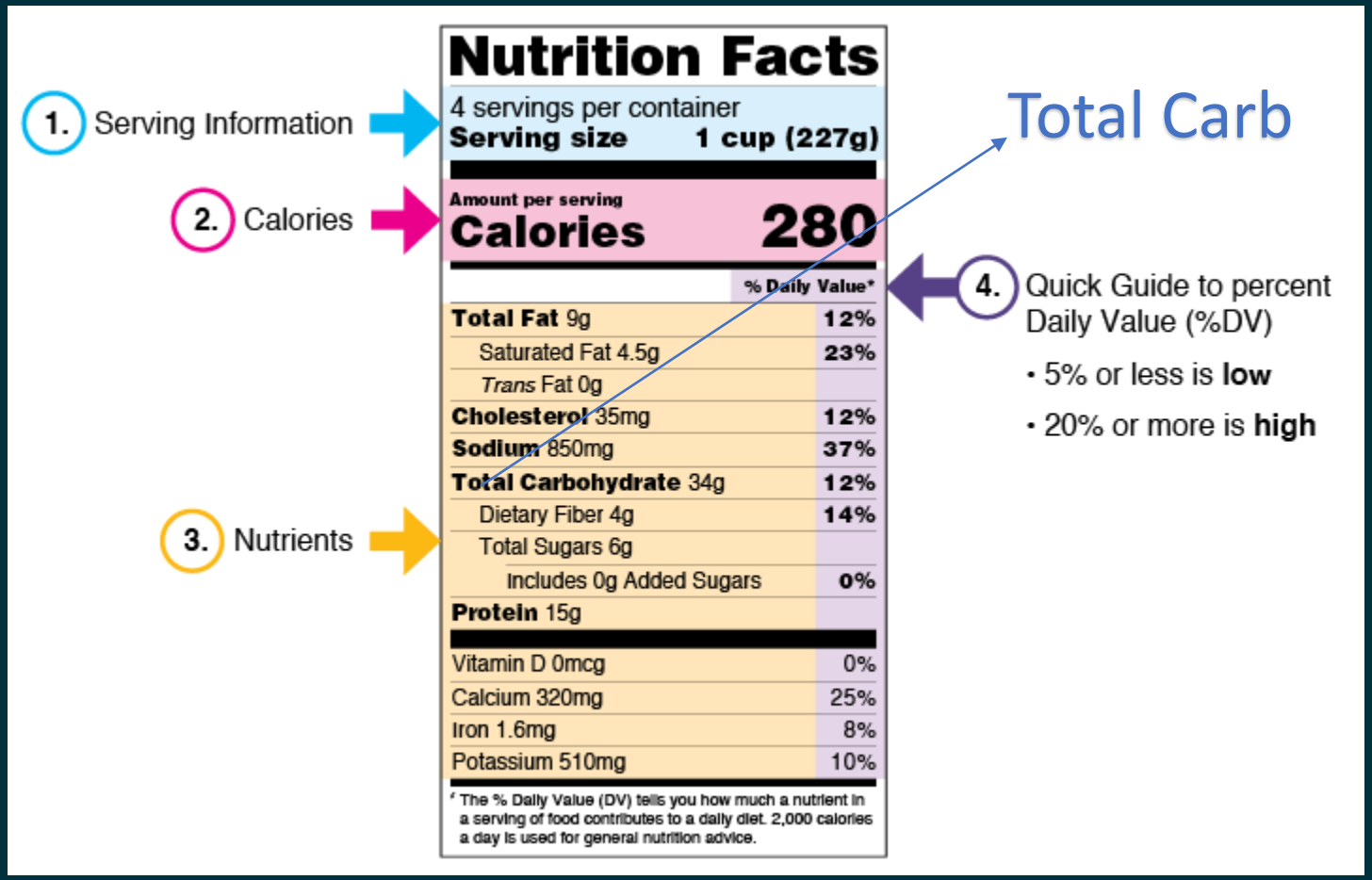
Phone ( ) _____

To find a Certified Diabetes Educator (CDE) **Call 1-800-832-6874**

From Nova Max

http://www.novacares.com/downloads/

Carb Counting – Advanced skill



Label graphic from https://www.accessdata.fda.gov/scripts/interactivenutritionfactslabel/assets/InteractiveNFL_TotalCarbohydrate_October2021.pdf

Carbohydrate

≥ 21-25g fiber/day
for 1500-1800 kcals/d

Nutrient dense

High in fiber
(at least 14g/1000 kcals)

Minimally processed

Non-starchy vegetables

Fruit

Whole grain

Dairy

Minimal added sugars

(Evidence Grade B)

Fiber

Regular intake of sufficient dietary fiber is associated with lower all-cause mortality in PWD

"More than 90 percent of women and 97 percent of men do not meet recommended intakes for dietary fiber. This aligns with intake patterns where fruits, vegetables, and whole grains are under-consumed by more than 85 percent of adults."

Pg 101, Dietary Guidelines for Americans 2020-2025

Carbohydrate

- Replace sugar sweetened beverage (including fruit juice) with H20
- Benefits: improved glycemic & weight control, reduce risk of cardiovascular disease & fatty liver

  (Evidence Grade B)
- Minimize foods with added sugar which may displace nutrient-dense options

  (Evidence Grade A)

Low Carb or Very Low Carb

Those w/ T2 DM not meeting glycemic targets or priority is to ↓ diabetes meds, an option is a low or very low carb EP

In T2, VLC & LC have been shown to reduce A1c & needs for glucose lowering meds

For T2 DM, studies show <26% of calories as CHO are effective in lowering A1c & need for meds in short-term (< 6 months) but less difference in EP beyond 1 year

Low Carb or Very Low Carb

Sustaining lower CHO long-term is difficult

Re-assess regularly

Adjust diabetes medications prn to prevent low BG

Recommended approach: individualize macronutrient distribution consistent w/ patient preference for long-term maintenance

Very Low CHO not recommended for some (pregnancy, lactation, children, renal dz, risk of disordered eating, caution in those on SGLT2-DKA potential)

Regardless of Carb Amount

Minimize: refined carb with added sugars, fat and/or sodium

https://www.eatthis.com/wp-content/uploads/sites/4/2020/12/unhealthiest-foods-planet.jpg?quality=82&strip=1

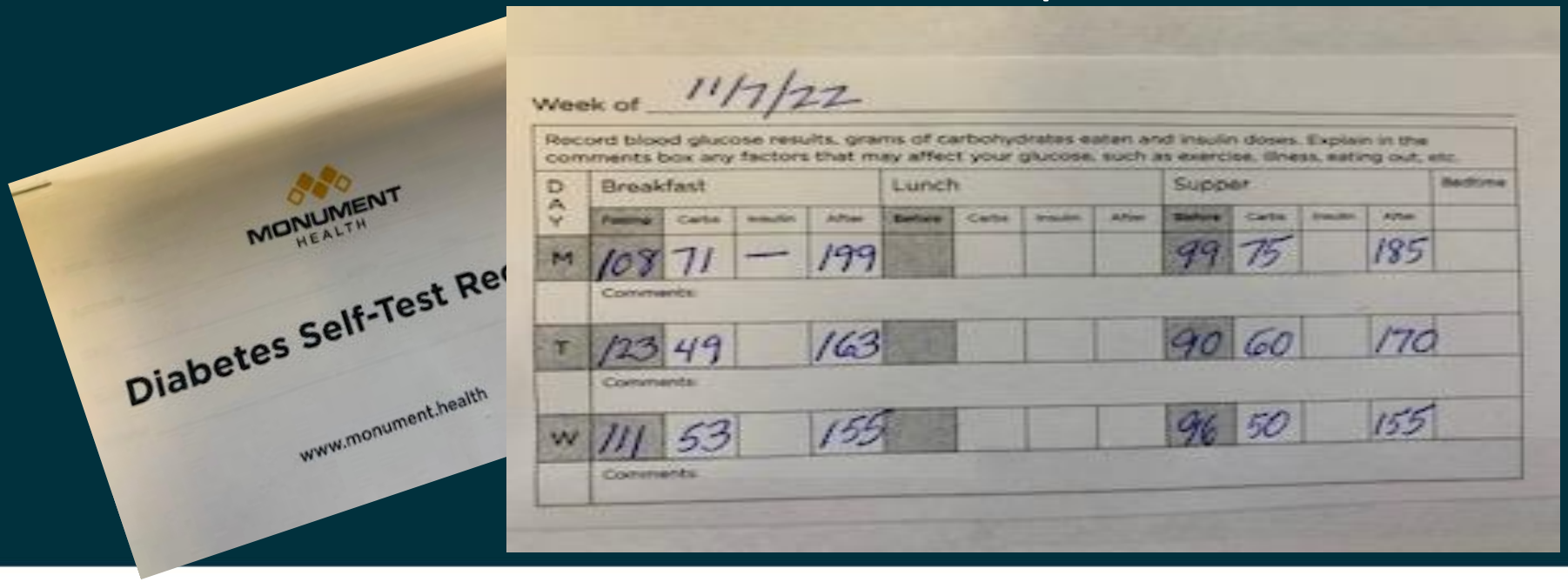
Focus on high quality, nutrient dense Carb sources that are high in fiber & minimally processed

https://cdn1.sph.harvard.edu/wp-content/uploads/sites/30/2012/09/carbohydrates.jpg

No Ideal Carb for PWD But…..

- In order to IMPROVE PP glucose management, it is key to monitor Carb intake and glucose response

- Educate on need to evaluate BG response to carb



Matching Meals with Insulin

- Fixed mealtime insulin - consistent carb intake & meal-times, consider insulin duration **(Evidence Grade B)**

- Flexible insulin, ie, ICR: educate on glycemic impact of carb (A).

ICR: Ensure good carb counting & math skills

Matching Meals with Insulin

- Dietary fat and protein can impact early & delayed PP glycemia & is dose dependent
- Additional insulin beyond the ICR may be needed for mixed meals: ie, carb, high fat &/or high protein
- Studies show individual differences in PP response
- More studies needed for optimal insulin dosing
- Tailor fat & protein to individual needs & use to optimize insulin dosing (Evidence B)

Matching Meals with Insulin

- Cautious in increasing insulin
- Monitor for high BG 3 or more hours PP
- Pump users can split a bolus delivery
- Dosing for high-fat and/or high protein meals requires additional determination & anticipation of intake in addition to carb counting

Glycemic Index (GI), Glycemic Load (GL)

- GI – ranks a Carb food based on PP impact
- GL – factor of the GI index & portion

- Complex literature, varying GI definitions of low/mod/high
- Mixed study results: 1 no significant impact on A1c, 2 showed A1c down by 0.15-0.5%

Fat

- Ideal amount of fat is controversial
- Evidence suggests there is not an ideal % of calories from total fat for PWD
- Individualize
- Type of fat more important
- Recommend limit saturated fat as for the general population

Saturated Fat

	Grams SF 10% of cals (ADA defers to DGA)
1200 cals/d	13
1500 cals/d	17
1800 cals/d	20
2000 cals/d	22

DGA recommend < 10% calories from saturated fat

"About 70 to 75 percent of adults exceed the 10-percent limit on saturated fat….."

Pg 102, Dietary Guidelines for Americans 2020-2025

Fat

- Decrease Saturated fat, replace with unsaturated fats NOT REFINED carbs

Conclusion on Fat

- Emphasize elements of the Mediterranean-style EP rich in MUFA & PUFA may be considered to improve glucose metabolism and lower CVD risk (B)
- Eat foods rich in long-chain n-3 fatty acids, like fatty fish (EPA & DHA) & nuts and seeds (ALA) to prevent or treat CVD (B)

Protein

Inconclusive research re: optimal amount of protein for glycemic control or CVD risk reduction

Individualize – current eating habits

Slightly higher protein (20-30%) may contribute to satiety

In Diabetes Kidney disease, do not restrict < RDA of 0.8g/kg (no impact on glycemia, CVD risk or GFR decline

Protein in Type 2 Diabetes

- Protein may increase endogenous insulin response to carb
- Use of carb sources also high in protein to treat or prevent hypoglycemia should be avoided (B)
- Treat hypoglycemia* w/ pure glucose or carb-containing foods without protein (*< 70)

Alcohol

Moderation
(1 drink/d women
2 drinks/d men)
Risks: hypoglycemia, delayed hypoglycemia
Educate re: risk
Encourage monitoring BG often after ETOH

1 = 12 oz beer, 5 oz wine, 1.5 oz distilled liquor

Omega-3 Supplements (n-3)

No conclusive evidence to recommend EPA & DHA ***supplements*** to all PWD for prevention or treatment CVD

ASCEND trial, 1g/d n-3 fatty acids vs placebo did not lead to CV benefit in PWD who did not have evidence of CVD

Omega-3 Supplements (n-3)

- REDUCE-IT trial: supplementation with *4g/d of pure EPA* significantly lowered the risk of adverse CV events *for those with established CVD*
- 5% absolute reduction in CV events for those w/ established atherosclerotic CVD, already taking a statin with continued high TG
- >8,000 participants, > 50% with DM

Sodium

- < 2300 mg sodium daily (Evidence Grade B)
- Matches suggestions for general population
- Even in PWD & HTN, rare to suggest lower Na+
- Consider palatability, availability, affordability, physical limitations/ability to prepare foods
- 9 IN 10 AMERICANS consume too much
  https://www.cdc.gov/media/releases/2016/p0106-sodium-intake.htmlmuch sodium.

Graphic from
https://www.cdc.gov/chronicdisease/resources/publications/factsheets/nutrition.htm

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Micronutrients

- No clear evidence of that vitamin & mineral supplementation improves outcomes for PWD without deficiencies (C)
- Exceptions where a vitamin and/or mineral supplementation should be considered

Those w/ identified deficiency	**Pregnancy, Lactation**
Older Adults	**Very Low-Calorie Diets**
Vegetarians	**Very Low Carb Diets**

B12 & Metformin

- DPPOS showed link b/t metformin & B12 deficiency
- Suggest periodic testing of B12 status especially in presence of anemia and peripheral neuropathy

Vitamin D

- Lack of evidence that it improves glycemia
- In certain individuals at risk for DM, *MAY* be a benefit of Vitamin D supplementation
- More research needed

Herbals, Antioxidant Supplementation

- Anti-oxidants – Vitamin E, C and carotene
- Lack of evidence that routine use is beneficial to improve glucose control & long-term safety questionable
- Herbals – cinnamon, curcumin, aloe vera, chromium
- Lack of evidence that

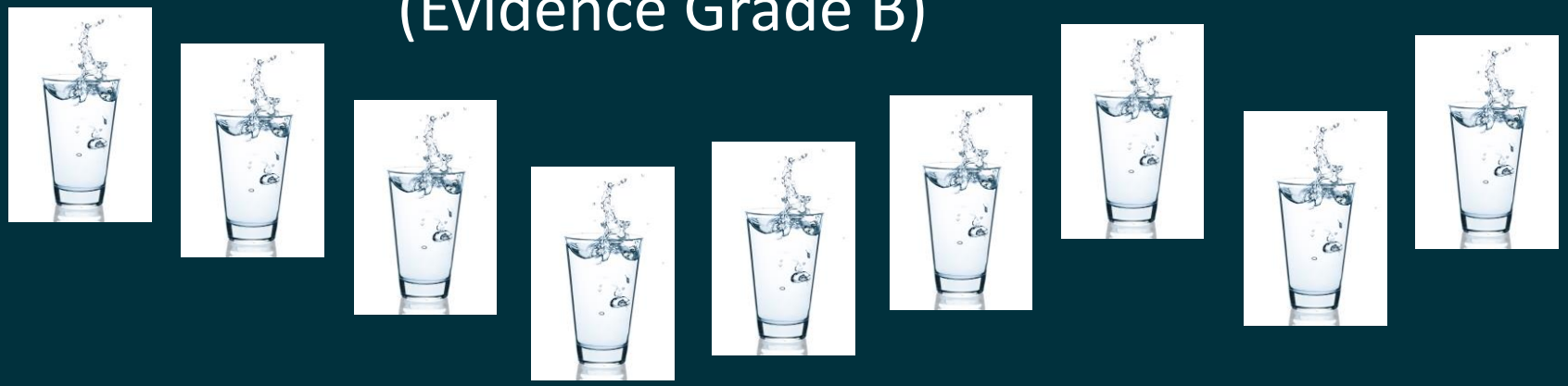
they improve glycemia

(Evidence Grade C)

Non-nutritive Sweeteners (NNS) aka Sugar Substitutes

- Do not have significant impact glyemic managment
- Replaced for sugar-sweetened products may reduce overall calorie & carb intake
- Recommend to drink water and reduce intake of beverages w/ sugar or NNS

(Evidence Grade B)



Summary

“Instead of emphasizing one nutrient, we need to move to food-based recommendations. What we eat should be whole, minimally processed, nutritious food—food that is in many cases as close to its natural form as possible.”

Dariush Mozaffarian, Dean of the Friedman School of Nutrition, Tufts University and adjunct associate professor of epidemiology

https://www.hsph.harvard.edu/magazine/magazine_article/is-butter-really-back/

Accessed 10/21/22

Resources

Source: American Diabetes Association Professional Practice Committee; 5. Facilitating Behavior Change and Well-being to Improve Health Outcomes: *Standards of Medical Care in Diabetes—2022*. *Diabetes Care* 1 January 2022; 45 (Supplement_1): S60–S82. https://doi.org/10.2337/dc22-S005

Additional Resource:

Nutrition Therapy for Adults with Diabetes or Prediabetes: A Consensus Report

Diabetes Care 2019;42(5):731–754

https://doi.org/10.2337/dci19-0014