

Personalized Nutrition for Type 2 Diabetes in the Era of Continuous Glucose Monitors

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INTRODUCTION

The goal of diabetes medical nutrition therapy (MNT) is “to promote and support healthful eating patterns, emphasizing a variety of nutritional foods to improve A1C, blood pressure, and cholesterol levels, weight management, and to delay or prevent complications.”¹

Recent advancements in continuous glucose monitors (CGMs) have been beneficial in supporting diabetes MNT. These monitors provide clearer insights into post-prandial glucose response (PPGR) variability and relevant factors. **Current research has shown that personalized nutrition plans are more effective in managing glycemic outcomes than generalized diets, especially when considering individual PPGR heterogeneity.**^{2,3}

Purpose

The case study presented here demonstrates how dietitians can assess PPGR heterogeneity in T2DM using CGM data to personalize nutrition interventions.

CASE STUDY PATIENT

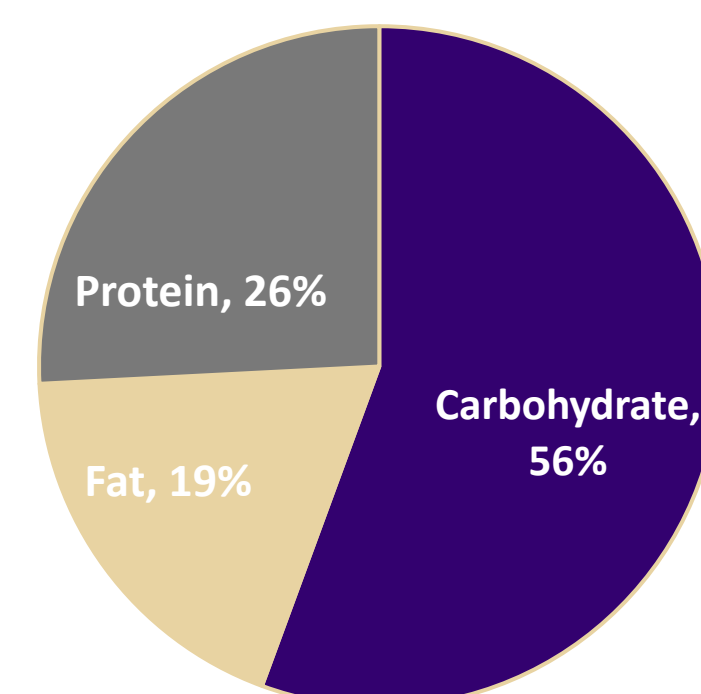
- 69 y/o male dx with T2D in 1999
- Tx: hybrid closed loop (Dexcom/Omnipod), Ozempic, Farxiga
- PMH: pancreatitis, acanthosis nigricans, microalbuminuria, kidney stones, neuropathy
- Roux-en-Y gastric bypass 2018 (A1c 8.4%, 313 lbs.)
- Current A1c 7.5% and 261 lbs

Diet Log

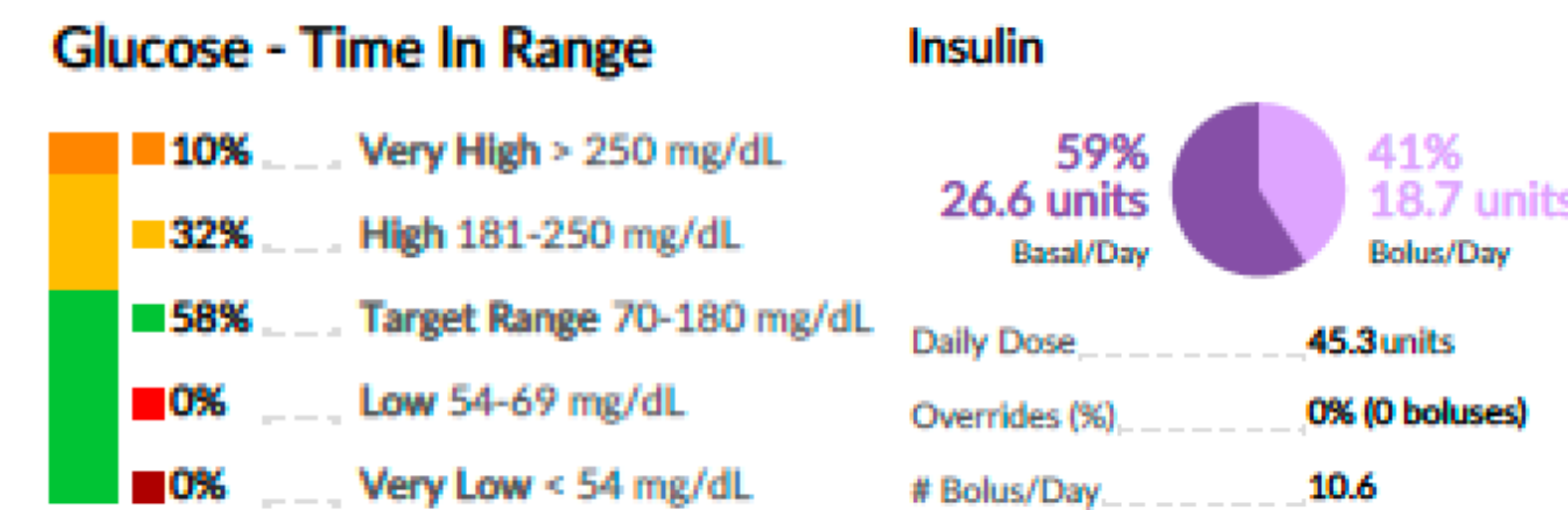
- 5 meals/day, consistent timing
- Avg 1,500 kcal, 161g CHO, 76g protein, 58 g fat
- Mostly premade or frozen meals

Meal and Time	Food	Frequency Eating Meal
Breakfast (5:30 AM)	Homemade breakfast burrito, applesauce, instant vanilla latte	5x/week
AM Snack (9 AM)	Protein shake	3x/week
Lunch (11:30 AM)	Frozen Turkey Meal	3x/week
PM Snack (3 PM)	Del Monte diced pears	4x/week
Dinner (5:30 PM)	Shoyu chicken thighs, instant white rice, protein shake	1-2x/week

Daily Macronutrient Distribution



Dexcom and Omnipod Data (6/18/23 – 7/17/23)



Average Blood Glucose Throughout Day

Time of Day	BG Average
Morning (5 – 10 AM)	175 mg/dL
Afternoon (10 AM – 3 PM)	196 mg/dL
Evening (3 – 9 PM)	206 mg/dL
Overnight (9 PM – 5 AM)	153 mg/dL

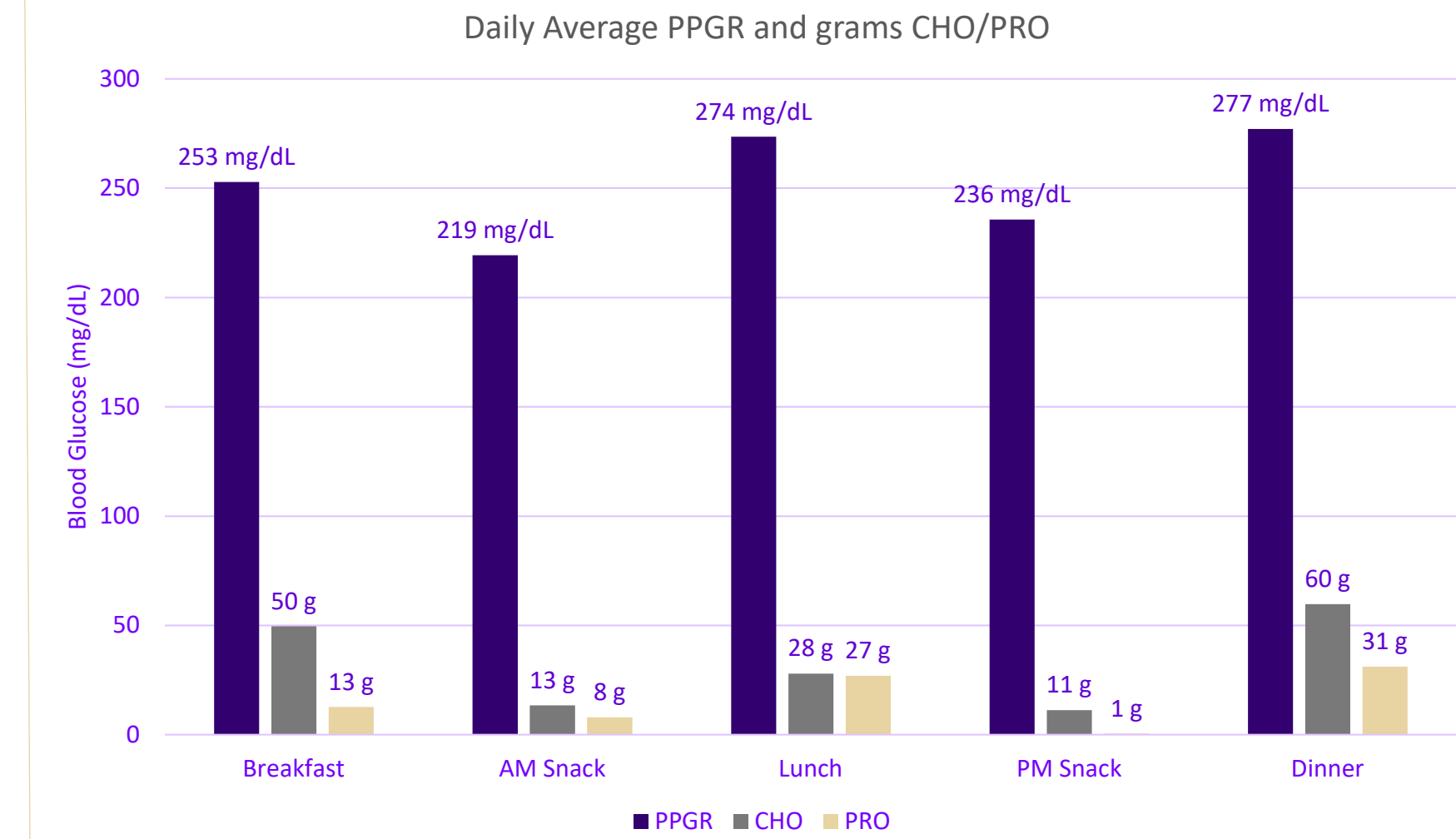
MNT INTERVENTION

Nutrition Diagnosis

Food/medication interaction related to higher daytime blood glucose threshold evidenced by glycemic variability in CGM/pump data.

Interventions

1. Adjusted BG correction threshold to lower daytime hyperglycemia.
2. Tightened ICR to 1:8.5
3. Increase protein by 10 grams per day (~30% daily kcal), at snacks and dinner based on PPGR.



Observations from Diet and PPGR

1. High PPGR variability, even to the same foods at the same times (especially at breakfast)
2. PPGR improved with 1:1 CHO to PRO ratio (AM snack vs. PM snack)
3. Dinner had highest PPGR and highest CHO but 1:1 CHO to PRO resulted in lowest BG <240

CONCLUSIONS

Despite consistency in the patient’s diet, meaningful variability still exists in PPGR even for identical meals eaten at the same time each day.

Future studies should assess PPGR heterogeneity in diabetes subjects.

CGM data combined with dietitian expertise will produce optimal MNT intervention for patients.

References
1. Evert AB, et al. Nutrition Therapy for Adults With Diabetes or Prediabetes: A Consensus Report. Diabetes Care. 2019;42(5):731-754. doi:10.2337/dci19-0014
2. Zeevi D, et al. Personalized Nutrition by Prediction of Glycemic Responses. Cell. 2015;163(5):1079-1094. doi:10.1016/j.cell.2015.11.001
3. Ben-Yacov O, et al. Personalized Postprandial Glucose Response-Targeting Diet Versus Mediterranean Diet for Glycemic Control in Prediabetes. Diabetes Care. 2021;44(9):1980-1991. doi:10.2337/dc21-0162