Diabetes and Hypertension Project ECHO* Clinic

*ECHO: Extension of Community Healthcare Outcomes

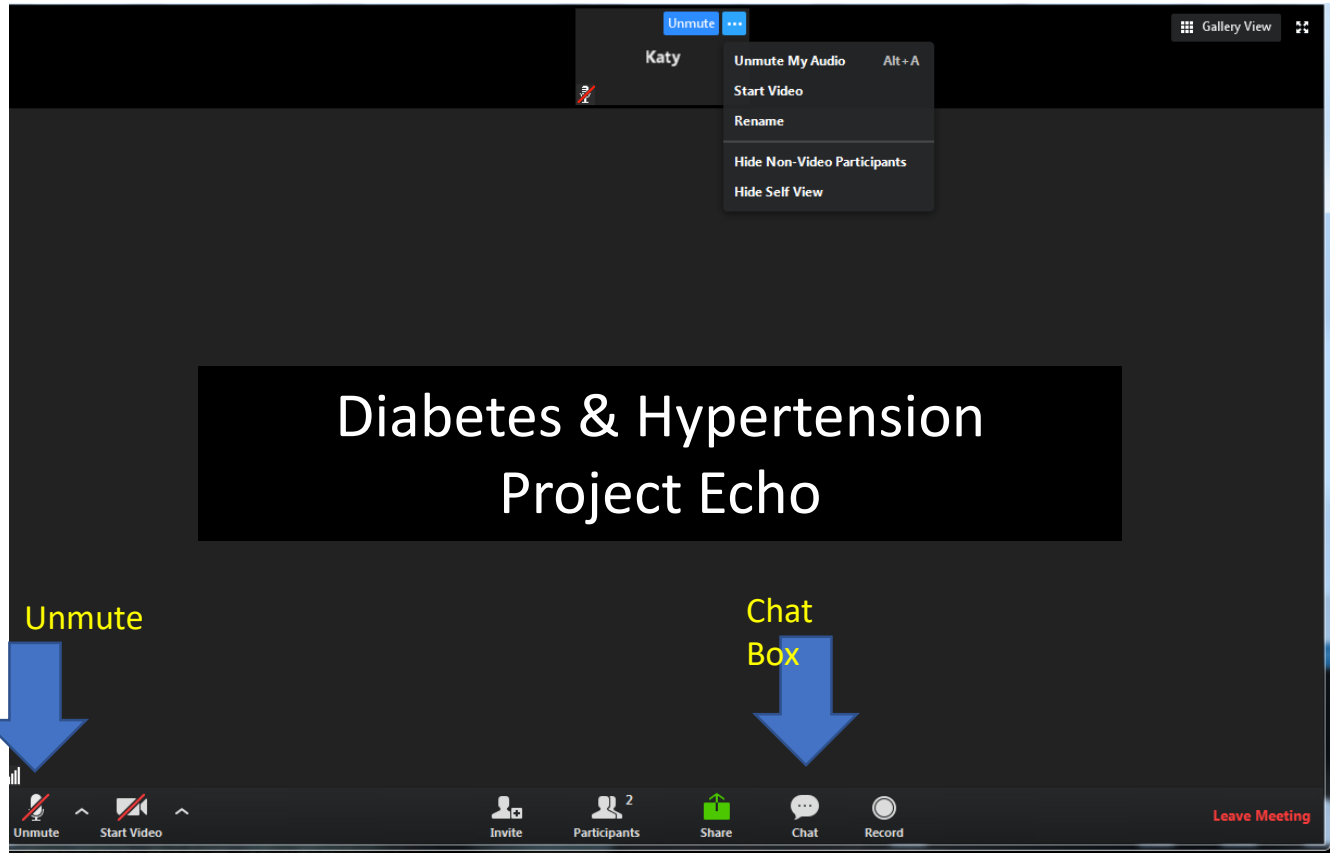
June 9, 2022

Before we begin:

- Rename your Zoom screen with your name and organization
- Claim CE: text 25395-25389 to 804-625-4041
  - Go to **vcuhealth.org/echodmhtn** for instructions on creating your account

The Diabetes and Hypertension ECHO is made possible by funding through CDC Cooperative Agreement NU58DP006620-InnoVAte.

Zoom Reminders



- You are all on mute. Please unmute to talk.
- If joining by telephone audio only, press *6 to mute and unmute.
- Use the chat function to speak with our team or ask questions.

Helpful Reminders

- Please feel free to eat your lunch or step away briefly if needed
- We are recording and can share sessions upon request
  - Each session's slides are available on www.vcuhealth.org/echodmhtn
- Please **do not share any protected health information** in your discussion or the chat box
- Project ECHO operates on the "All Teach, All Learn" model
  - Feel free to ask questions in the chat or unmute to ask questions at designated times
  - We're all here to learn from each other and value each person's input and expertise!

VCU Health Diabetes & Hypertension ECHO Clinics

VCU Hub Team	
Principal Investigator	Dave Dixon, PharmD
Administrative Medical Director ECHO Hub	Vimal Mishra, MD, MMCi
Clinical Experts	Niraj Kothari, MD Trang Le, MD
Project Coordinator/IT Support	Madeleine Wagner

- One-hour ECHO clinics on 2nd Thursdays
- Every ECHO clinic includes a didactic presentation followed by case discussions
- Website: www.vcuhealth.org/echodmhtn
  - Directions for claiming CE can be found here
  - You have up to six days after our session to claim CE by texting **25395-25389** to **804-625-4041**

Disclosures

Trang Le, M.D., has no financial conflicts of interest to disclose.

Salvatore Carbone, Ph.D., has no financial conflicts of interest to disclose.

There is no commercial or in-kind support for this activity.

Which Diet is Best for my Patient with Diabetes?

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@totocarbone

Case

- 60 yo Black AA man with history of severe obesity, T2DM, hypertension, obstructive sleep apnea presents to the cardiopharmaconutrition clinic after seen cardiologist and found to have BP 160/91, HR 85 and progressive weight gain (~5-7 kg/year) and heart failure with preserved ejection fraction.
- Body weight 173.4 kg, height 175cm, BMI 56.2 kg/m^2
- HbA1c is 7.5%, LDL-c 106 mg/dL, TG 167 mg/dL, creat 0.95, eGFR 98. No allergies, however, not in favor of using daily injectable agents for weight loss as they have been proposed to him before. Currently on fosinopril 10mg, chlorthalidone 25mg BID, VitD and metformin 500mg BID (does not tolerate higher dose) and does not want to take any additional medication at this stage.
- Cardiologist adds for primary prevention: Aspirin 81 mg daily and Rosuvastatin 10 mg daily.

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

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

Table 1—Goals of nutrition therapy

- To promote and support healthful eating patterns, emphasizing a variety of nutrient-dense foods in appropriate portion sizes, in order to improve overall health and specifically to:
  - Improve A1C, blood pressure, and cholesterol levels (goals differ for individuals based on age, duration of diabetes, health history, and other present health conditions. Further recommendations for individualization of goals can be found in the ADA *Standards of Medical Care in Diabetes* [345])
  - Achieve and maintain body weight goals
  - Delay or prevent complications of diabetes
- To address individual nutrition needs based on personal and cultural preferences, health literacy and numeracy, access to healthful food choices, willingness and ability to make behavioral changes, as well as barriers to change
- To maintain the pleasure of eating by providing positive messages about food choices, while limiting food choices only when indicated by scientific evidence
- To provide the individual with practical tools for day-to-day meal planning

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Table 2—Academy of Nutrition and Dietetics evidence-based nutrition practice guidelines–recommended structure for the implementation of MNT for adults with diabetes (9)

Initial series of MNT encounters: The RDN should implement three to six MNT encounters during the first 6 months following diagnosis and determine if additional MNT encounters are needed based on an individualized assessment.

MNT follow-up encounters: The RDN should implement a minimum of one annual MNT follow-up encounter.

Consensus recommendations

- Evidence suggests that there is not an ideal percentage of calories from carbohydrate, protein, and fat for all people with or at risk for diabetes; therefore, macronutrient distribution should be based on individualized assessment of current eating patterns, preferences, and metabolic goals.

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Table 3—Eating patterns reviewed for this report

Type of eating pattern	Description	Potential benefits reported*
USDA Dietary Guidelines For Americans (DGA) (8)	Emphasizes a variety of vegetables from all of the subgroups; fruits, especially whole fruits; grains, at least half of which are whole intact grains; lower-fat dairy; a variety of protein foods; and oils. This eating pattern limits saturated fats and *trans* fats, added sugars, and sodium.	DGA added to the table for reference; not reviewed as part of this Consensus Report
Mediterranean-style (69,76,85–91)	Emphasizes plant-based food (vegetables, beans, nuts and seeds, fruits, and whole intact grains); fish and other seafood; olive oil as the principal source of dietary fat; dairy products (mainly yogurt and cheese) in low to moderate amounts; typically fewer than 4 eggs/week; red meat in low frequency and amounts; wine in low to moderate amounts; and concentrated sugars or honey rarely.	• Reduced risk of diabetes • A1C reduction • Lowered triglycerides • Reduced risk of major cardiovascular events
Vegetarian or vegan (77–80,92–99)	The two most common approaches found in the literature emphasize plant-based vegetarian eating devoid of all flesh foods but including egg (ovo) and/or dairy (lacto) products, or vegan eating devoid of all flesh foods and animal-derived products.	• Reduced risk of diabetes • A1C reduction • Weight loss • Lowered LDL-C and non–HDL-C
Low-fat (26,45,80,83,100–106)	Emphasizes vegetables, fruits, starches (e.g., breads/crackers, pasta, whole intact grains, starchy vegetables), lean protein sources (including beans), and low-fat dairy products. In this review, defined as total fat intake ≤30% of total calories and saturated fat intake ≤10%.	• Reduced risk of diabetes • Weight loss
Very low-fat (107–109)	Emphasizes fiber-rich vegetables, beans, fruits, whole intact grains, nonfat dairy, fish, and egg whites and comprises 70–77% carbohydrate (including 30–60 g fiber), 10% fat, 13–20% protein.	• Weight loss • Lowered blood pressure
Low-carbohydrate (110–112)	Emphasizes vegetables low in carbohydrate (such as salad greens, broccoli, cauliflower, cucumber, cabbage, and others); fat from animal foods, oils, butter, and avocado; and protein in the form of meat, poultry, fish, shellfish, eggs, cheese, nuts, and seeds. Some plans include fruit (e.g., berries) and a greater array of nonstarchy vegetables. Avoids starchy and sugary foods such as pasta, rice, potatoes, bread, and sweets. There is no consistent definition of "low" carbohydrate. In this review, a low-carbohydrate eating pattern is defined as reducing carbohydrates to 26–45% of total calories.	• A1C reduction • Weight loss • Lowered blood pressure • Increased HDL-C and lowered triglycerides
Very low-carbohydrate (VLC) (110–112)	Similar to low-carbohydrate pattern but further limits carbohydrate-containing foods, and meals typically derive more than half of calories from fat. Often has a goal of 20–50 g of nonfiber carbohydrate per day to induce nutritional ketosis. In this review a VLC eating pattern is defined as reducing carbohydrate to <26% of total calories.	• A1C reduction • Weight loss • Lowered blood pressure • Increased HDL-C and lowered triglycerides
Dietary Approaches to Stop Hypertension (DASH) (81,118,119)	Emphasizes vegetables, fruits, and low-fat dairy products; includes whole intact grains, poultry, fish, and nuts; reduced in saturated fat, red meat, sweets, and sugar-containing beverages. May also be reduced in sodium.	• Reduced risk of diabetes • Weight loss • Lowered blood pressure
Paleo (120–122)	Emphasizes foods theoretically eaten regularly during early human evolution, such as lean meat, fish, shellfish, vegetables, eggs, nuts, and berries. Avoids grains, dairy, salt, refined fats, and sugar.	• Mixed results • Inconclusive evidence

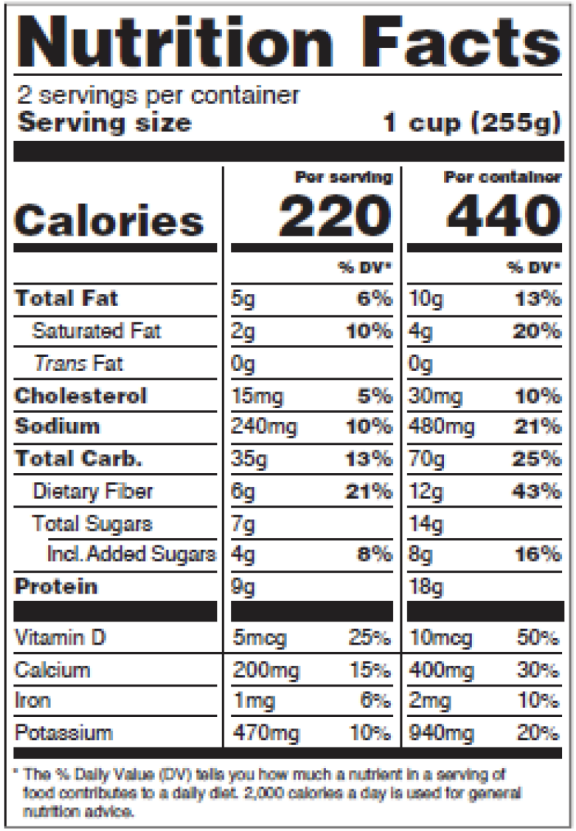
*Source: RCTs, meta-analyses, observational studies, nonrandomized single-arm studies, cohort studies. USDA, U.S. Department of Agriculture.

- Until the evidence surrounding comparative benefits of different eating patterns in specific individuals strengthens, health care providers should focus on the key factors that are common among the patterns:
  - Emphasize nonstarchy vegetables.
  - Minimize added sugars and refined grains.
  - Choose whole foods over highly processed foods to the extent possible.

- Studies using personalized nutrition approaches to examine genetic, metabolomic, and microbiome variations have not yet identified specific factors that consistently improve outcomes in type 1 diabetes, type 2 diabetes, or prediabetes.

How many calories?

Quantity vs *Quality*…



Nutrition Facts

2 servings per container

Serving size **1 cup (255g)**

	Per serving		Per container	
Calories	**220**		**440**	
		% DV*		% DV*
Total Fat	5g	6%	10g	13%
Saturated Fat	2g	10%	4g	20%
Trans Fat	0g		0g	
Cholesterol	15mg	5%	30mg	10%
Sodium	240mg	10%	480mg	21%
Total Carb.	35g	13%	70g	25%
Dietary Fiber	6g	21%	12g	43%
Total Sugars	7g		14g	
Incl. Added Sugars	4g	8%	8g	16%
Protein	9g		18g	
Vitamin D	5mcg	25%	10mcg	50%
Calcium	200mg	15%	400mg	30%
Iron	1mg	6%	2mg	10%
Potassium	470mg	10%	940mg	20%

* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

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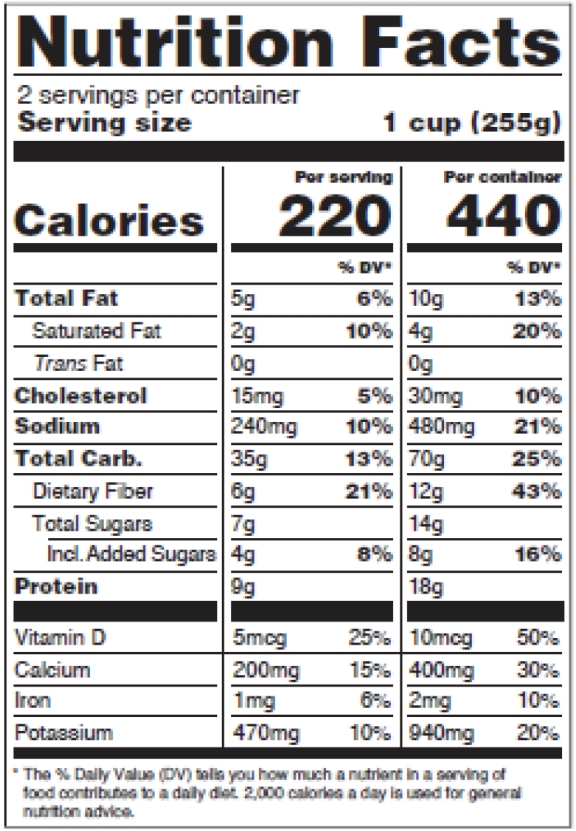

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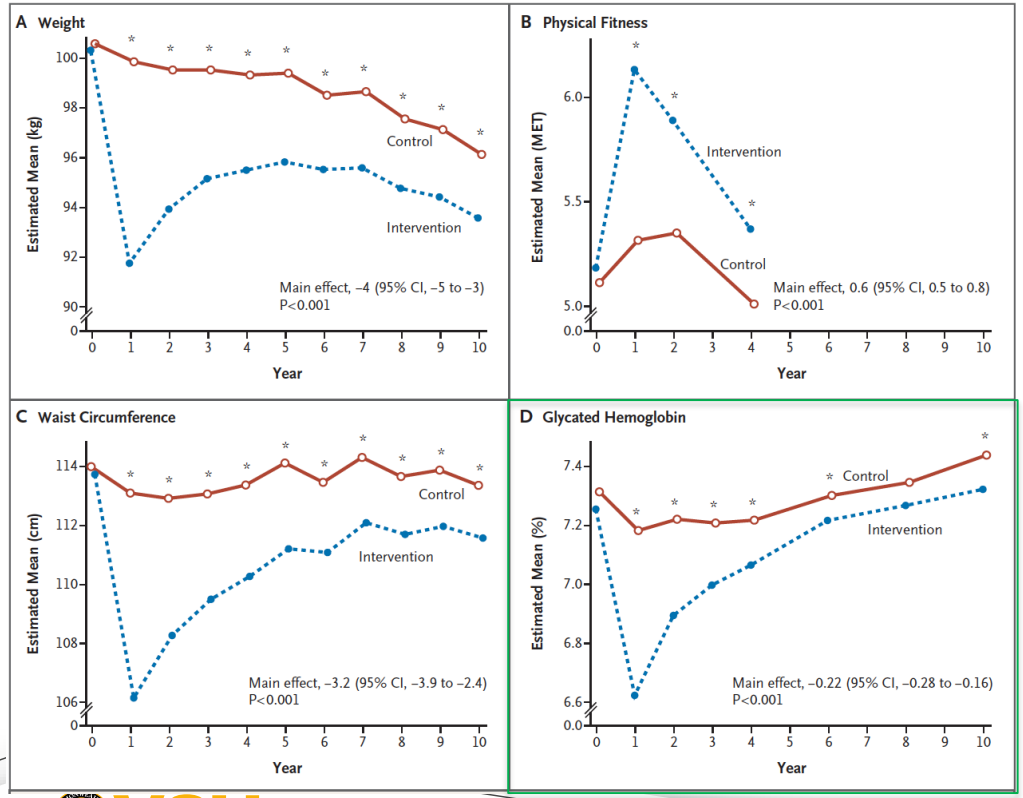
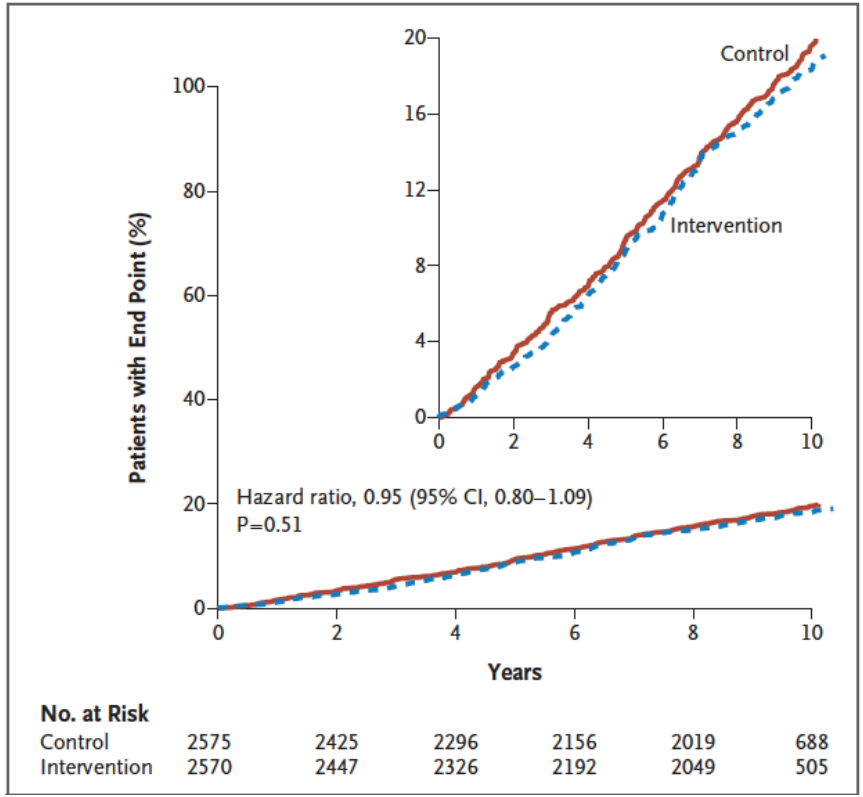
In type 2 diabetes, 5% weight loss is recommended to achieve clinical benefit.
The goal for optimal outcomes is 10-15% or more when needed and can be feasibly and safely accomplished





Look AHEAD Research Group. *N Engl J Med* 2013;369 (2):145-54

Association of the magnitude of weight loss and changes in physical fitness with long-term cardiovascular disease outcomes in overweight or obese people with type 2 diabetes: a post-hoc analysis of the Look AHEAD randomised clinical trial

	Weight-change categories (percentage weight loss in first year; n=4834)				
	Gain or stable (<2% loss)	Small loss (≥2–<5%)	Medium loss (≥5–<10%)	Large loss (≥10%)	p value
Primary outcome					
Events per person-years	289/17 075	141/7870	154/8570	128/8942	..
Crude rate per 100 person-years	1·69	1·79	1·80	1·43	..
Unadjusted hazard ratio (95% CI)	1·00	1·07 (0·88–1·31)	1·07 (0·88–1·31)	0·83 (0·67–1·02)	0·21
Adjusted hazard ratio† (95% CI)	1·00	1·08 (0·88–1·33)	1·16 (0·95–1·42)	0·79 (0·64–0·98), p=0·034*	0·17
Secondary outcome					
Events per person-years	422/16 699	206/7657	203/8411	186/8792	..
Crude rate per 100 person-years	2·53	2·69	2·41	2·12	..
Unadjusted hazard ratio (95% CI)	1·00	1·08 (0·91–1·27)	0·96 (0·81–1·13)	0·83 (0·70–0·99), p=0·035*	0·04
Adjusted hazard ratio† (95% CI)	1·00	1·05 (0·88–1·25)	0·97 (0·82–1·16)	0·76 (0·63–0·91), p=0·003*	0·006

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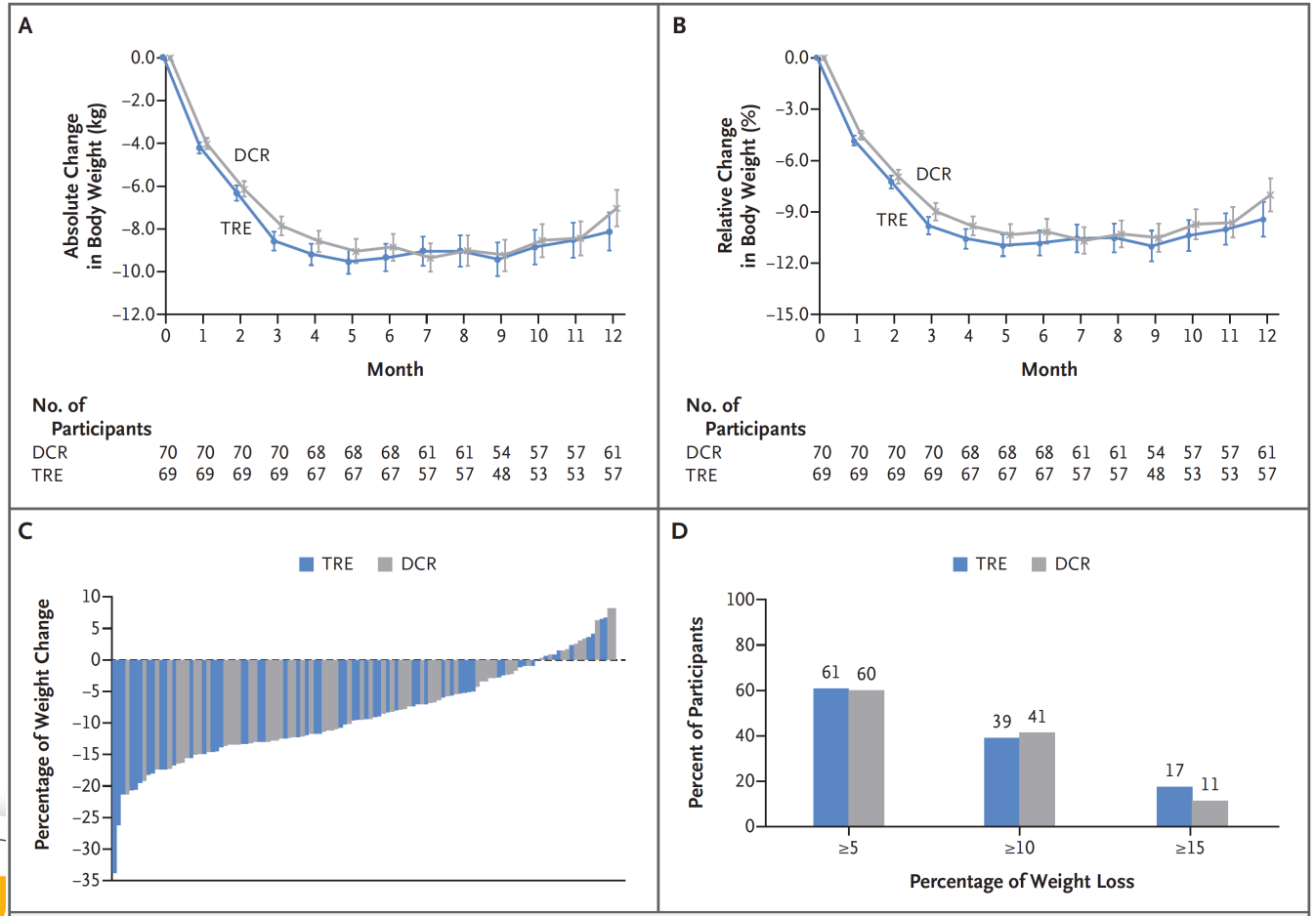
Look AHEAD Research Group. *Lancet Diabetes Endocrinol* 2016:4 (11):913-921

Calorie Restriction with or without Time-Restricted Eating in Weight Loss

No diabetes



Liu D et al. *N Engl J Med* 2022;386(16):1495-1504

Effects of Time-Restricted Eating on Weight Loss and Other Metabolic Parameters in Women and Men With Overweight and Obesity

The TREAT Randomized Clinical Trial

Table 2. Weight Change in the Total Cohort

Total Cohort (iHealth weight measurements)	CMT (n = 57 included in analysis)				TRE (n = 59 included in analysis)					
	Preintervention	Postintervention	ΔCMT	ΔCMT *P* value	Preintervention	Postintervention	ΔTRE	ΔTRE *P* value	Difference between groups	*P* value
iHealth weight, mean (SD), kg	99.2 (95.1 to 103.3)	98.5 (94.3 to 102.7)	−0.68 (−1.41 to 0.05)	.07	99.2 (95.1 to 103.2)	98.2 (94.1 to 102.4)	−0.94 (−1.68 to −0.20)	.01	−0.26 (−1.30 to 0.78)	.63
Weight change, mean (SD), %	NA	NA	−0.75 (−1.47 to −0.04)	.04	NA	NA	−1.17 (−1.89 to −0.45)	.002	−0.41 (−1.43 to 0.60)	.43

Abbreviations: CMT, consistent meal timing group; NA, not applicable; TRE, time-restricted eating group.

Table 3. Body Composition and Energy Expenditure Measurements in the In-Person Cohort[a]

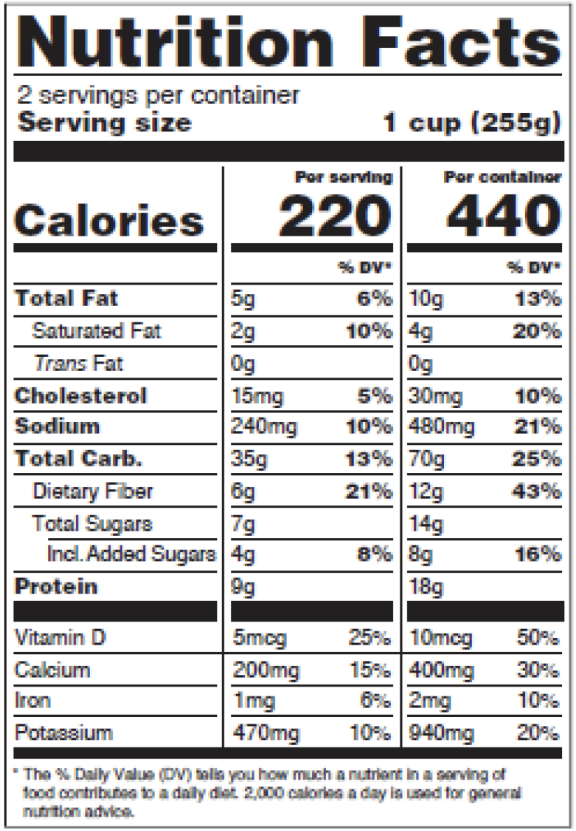
In-person cohort	CMT				TRE					
	Preintervention (n = 25)	Postintervention (n = 24)	ΔCMT	ΔCMT *P* value	Preintervention (n = 25)	Postintervention (n = 22)	ΔTRE	ΔTRE *P* value	Difference between groups	*P* value
Weight, kg[b]	93.0 (87.4 to 98.5)	92.4 (86.9 to 97.9)	−0.57 (−1.40 to 0.26)	.18	92.6 (87.0 to 98.1)	90.9 (85.3 to 96.4)	−1.70 (−2.56 to −0.83)	<.001[b]	−1.13 (−2.33 to 0.07)	.07
Weight change, %			−0.65 (−1.64 to 0.34)	.19			−1.81 (−2.85 to −0.78)	<.001[b]	−1.16 (−2.59 to 0.27)	.11
Fat mass, kg[b]	30.7 (27.7 to 33.7)	30.6 (27.6 to 33.6)	−0.03 (−0.66 to 0.60)	.93	30.3 (27.3 to 33.3)	29.8 (26.8 to 32.8)	−0.51 (−1.17 to 0.15)	.13	−0.48 (−1.75 to 0.79)	.3
Fat mass, %	33.0 (30.4 to 35.7)	32.9 (30.3 to 35.6)	−0.07 (−0.55 to 0.42)	.78	32.9 (30.3 to 35.6)	32.8 (30.2 to 35.5)	−0.09 (−0.59 to 0.42)	.74	−0.02 (−0.72 to 0.68)	.96
Visceral fat mass, kg	0.625 (0.529 to 0.721)	0.634 (0.537 to 0.730)	0.0088 (−0.0188 to 0.0364)	.53	0.58 (0.48 to 0.67)	0.576 (0.480 to 0.673)	−0.0026 (−0.0314 to 0.0263)	.86	−0.0114 (−0.0513 to 0.0285)	.58
Subcutaneous fat mass, kg	1.95 (1.74 to 2.17)	1.94 (1.72 to 2.16)	−0.013 (−0.066 to 0.040)	.63	1.87 (1.66 to 2.09)	1.84 (1.62 to 2.06)	−0.038 (−0.093 to 0.017)	.17	−0.025 (−0.101 to 0.051)	.51
Lean mass, kg[b]	59.7 (55.3 to 64.1)	59.3 (55.0 to 63.7)	−0.35 (−0.95 to 0.25)	.25	60.0 (55.6 to 64.4)	58.9 (54.5 to 63.3)	−1.10 (−1.73 to −0.48)	<.001[b]	−0.75 (−1.96 to 0.45)	.09
Trunk lean mass, kg	30.5 (28.3 to 32.6)	30.3 (28.2 to 32.5)	−0.15 (−0.54 to 0.24)	.45	30.4 (28.3 to 32.6)	30.0 (27.8 to 32.1)	−0.47 (−0.88 to −0.06)	.024[c]	−0.32 (−0.89 to 0.25)	.27
Appendicular lean mass, kg	25.8 (23.6 to 28.0)	25.6 (23.4 to 27.8)	−0.17 (−0.41 to 0.07)	.16	26.1 (24.0 to 28.3)	25.5 (23.3 to 27.7)	−0.64 (−0.89 to −0.39)	<.001[b]	−0.47 (−0.82 to −0.12)	.009
Appendicular lean mass index, kg/m^2	8.62 (8.10 to 9.14)	8.56 (8.04 to 9.08)	−0.058 (−0.136 to 0.020)	.14	8.80 (8.28 to 9.32)	8.58 (8.06 to 9.10)	−0.220 (−0.301 to −0.139)	<.001[b]	−0.162 (−0.274 to −0.050)	.005
Total body water, kg[c]	42.7 (39.6 to 45.8)	42.1 (39.0 to 45.2)	−0.59 (−1.06 to −0.13)	.01	41.9 (38.6 to 45.1)	41.5 (38.3 to 44.7)	−0.36 (−0.85 to 0.13)	.14	0.23 (−0.44 to 0.91)	.5

Lower Physical Activity Level, p=0.033
Greater awake time, p=0.01

Lowe DA et al. *JAMA Intern Med* 2020;180(11):1491-1499

How many calories?

Quantity **vs** ***Quality*****…**



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Weight Loss with a Low-Carbohydrate, Mediterranean, or Low-Fat Diet

Dietary Intervention Randomized Controlled Trial (DIRECT)

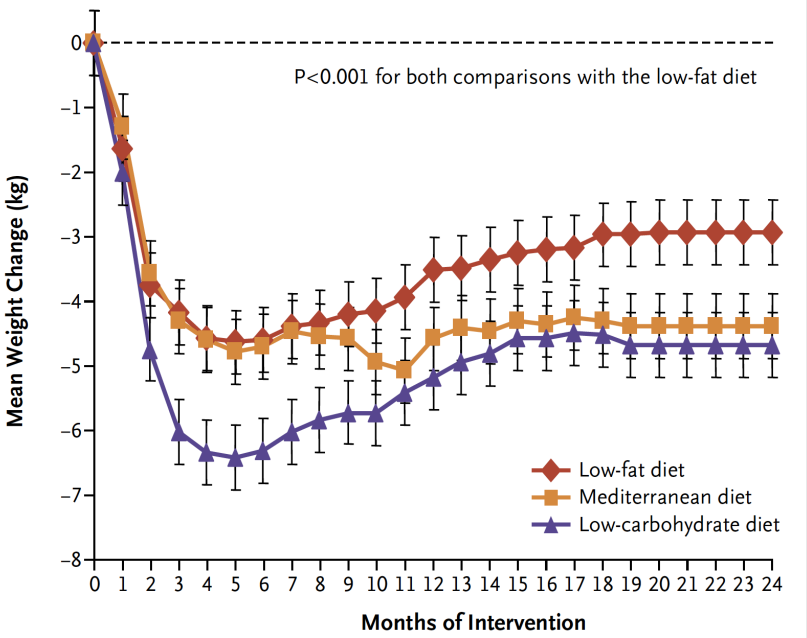

Figure 2. Weight Changes during 2 Years According to Diet Group.

Vertical bars indicate standard errors. To statistically evaluate the changes in weight measurements over time, generalized estimating equations were used, with the low-fat group as the reference group. The explanatory variables were age, sex, time point, and diet group.

30% total fat, 9.6% SFA

33% total fat, 9.6% SFA (high-UFA)

39% total fat, 12.3% SFA

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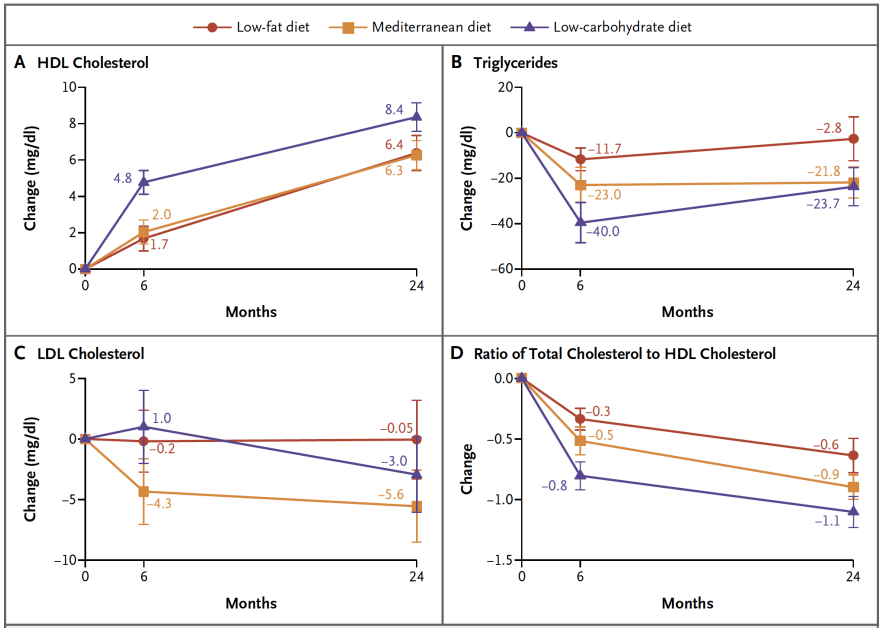
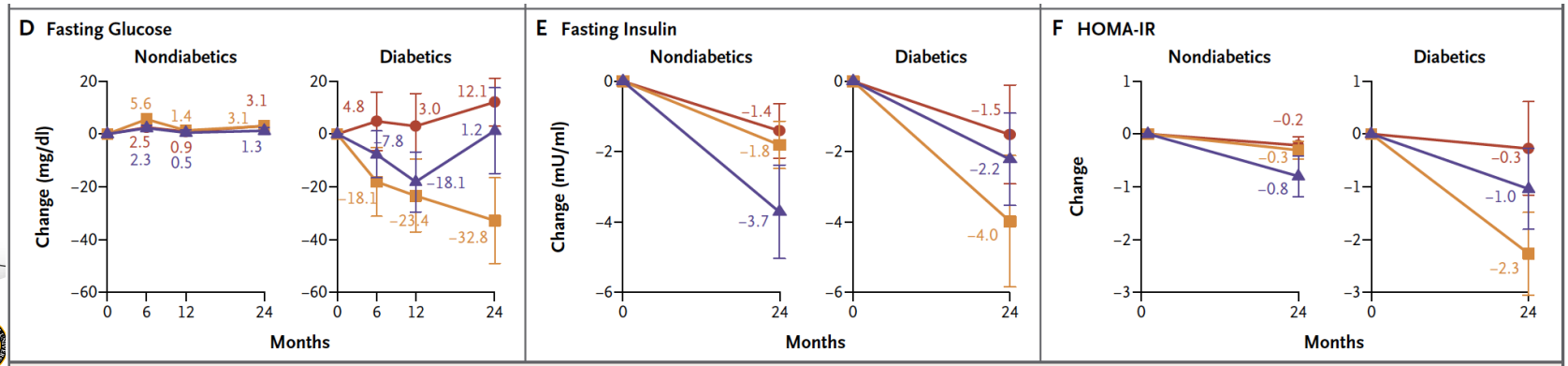
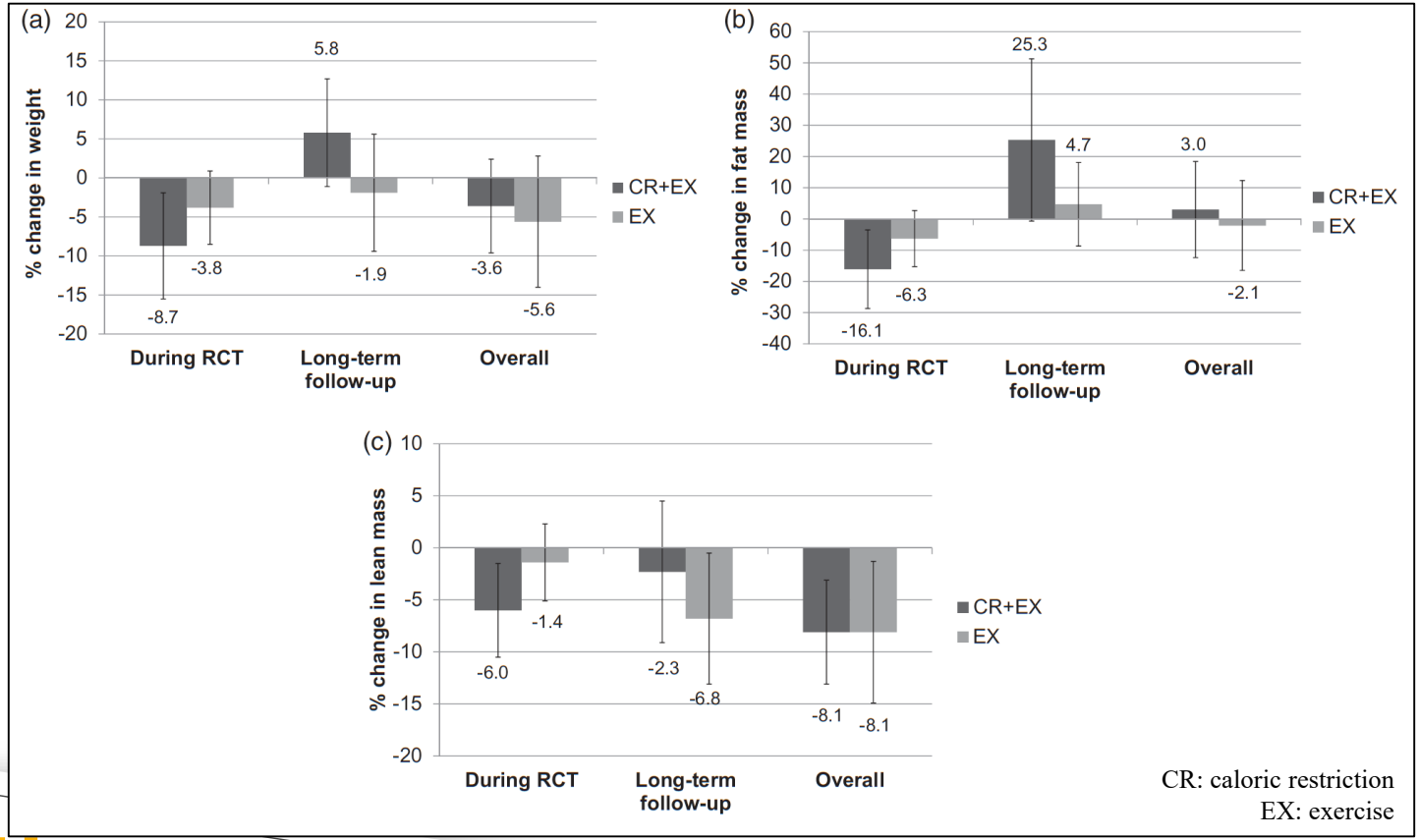
Shai I et al. *N Engl J Med* 2008;359(3):229-41





Shai I et al. *N Engl J Med* 2008;359(3):229-41

Long-Term Effects of Randomization to a Weight Loss Intervention in Older Adults: A Pilot Study

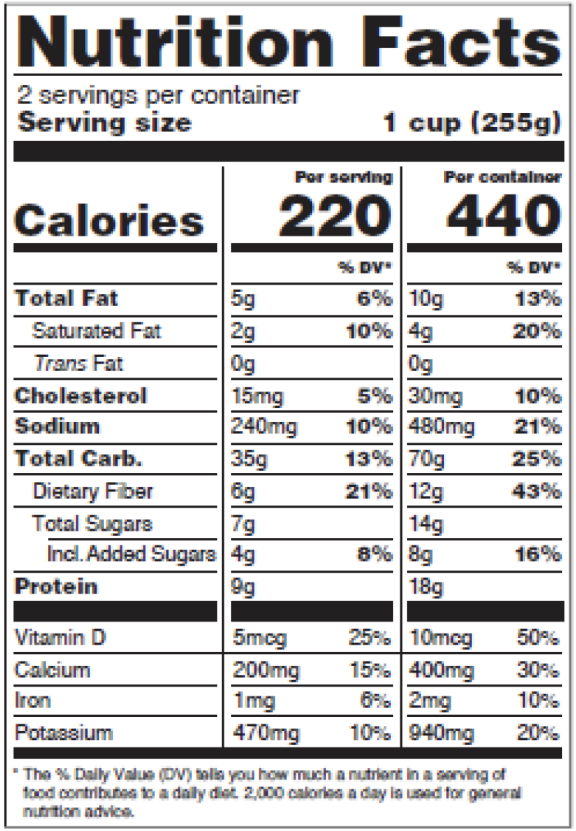


CR: caloric restriction
EX: exercise

Houston DK et al. *J Nutr Gerontol Geriatr* 2019;38(1):83-99

How many calories?

Quantity **vs** ***Quality*****…**



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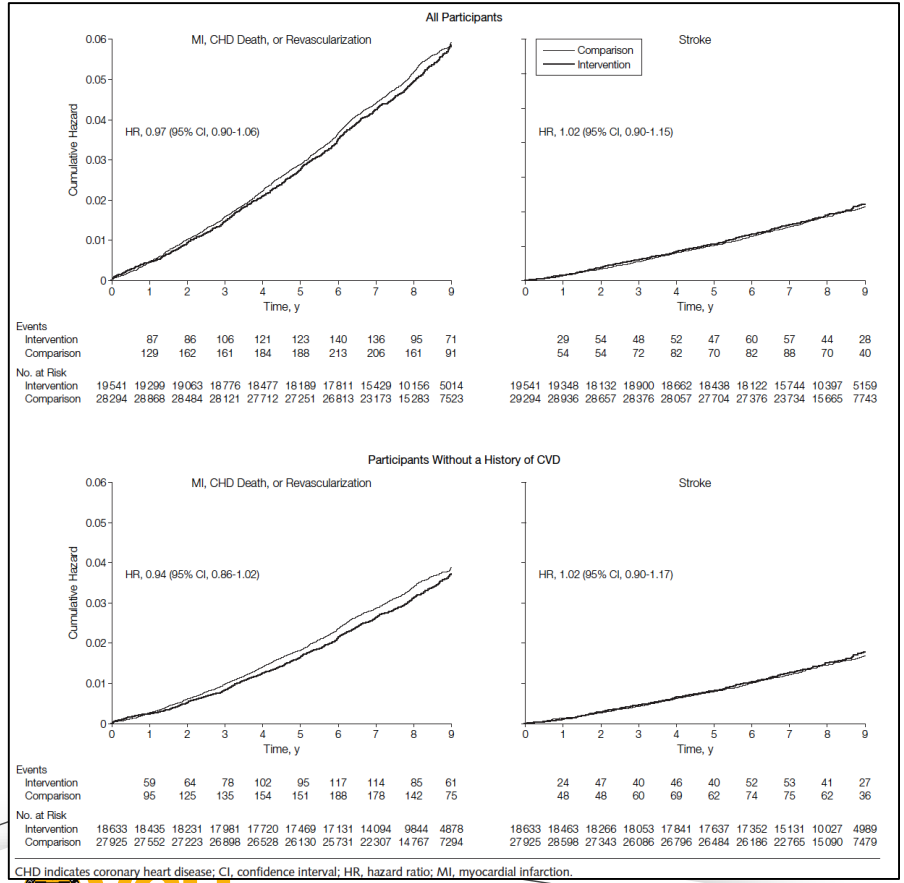
Low-Fat Dietary Pattern and Risk of Cardiovascular Disease

The Women's Health Initiative Randomized Controlled Dietary Modification Trial

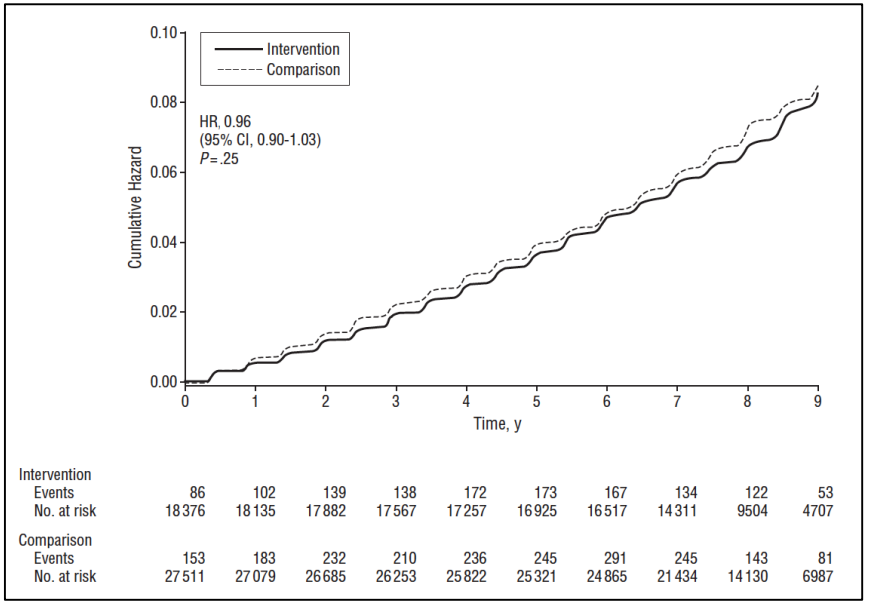
- Goal <20% kcal from Fats (and presumed associated <7% from SFA)
- Fruits and vegetables to at least 5 servings/day
- Grains to 6 servings/day
- 18 group sessions for 1st year and then quarterly thereafter



CHD indicates coronary heart disease; CI, confidence interval; HR, hazard ratio; MI, myocardial infarction.

Low-Fat Dietary Pattern and Risk of Treated Diabetes Mellitus in Postmenopausal Women

The Women's Health Initiative Randomized Controlled Dietary Modification Trial

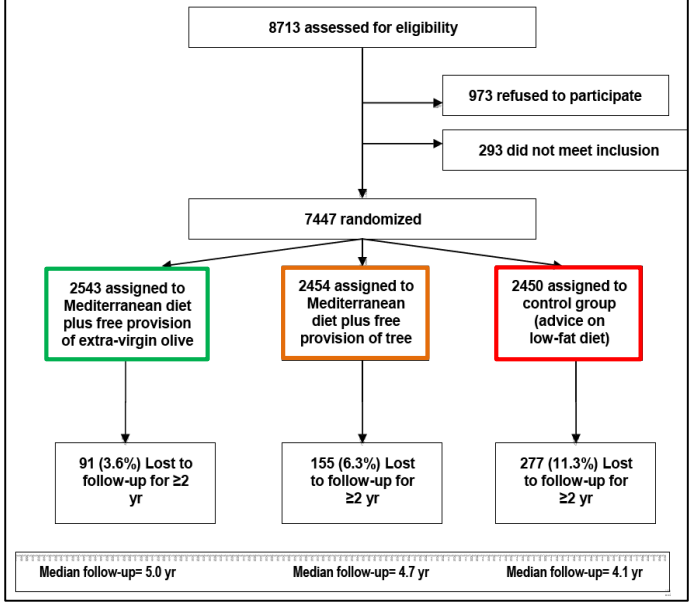


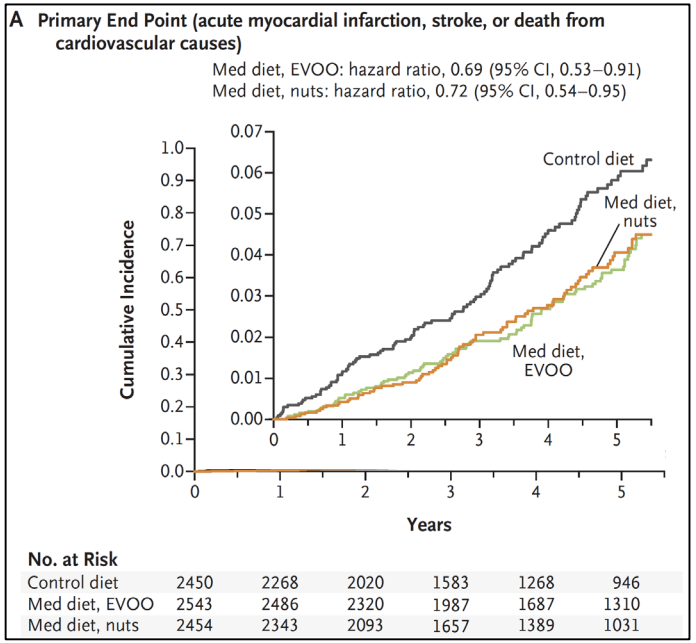
Howard BV et al. *JAMA* 2006;295(6):655-66

Tinker LF et al. *Arch Intern Med* 2008;168(14):1500-11

Primary Prevention of Cardiovascular Disease with a Mediterranean Diet Supplemented with Extra-Virgin Olive Oil or Nuts

Figure S2. Trial Profile.





Subgroups	(n, events)	Multivariable-adjusted* Hazard Ratios (95% CI) MeDiet + EVOO	MeDiet + Nuts	Control	P for interaction
Sex					
Men	(3165, 171)	0.73 (0.51-1.04)	0.65 (0.45-0.95)	1 (ref.)	
Women	(4282, 117)	0.64 (0.42-0.98)	0.86 (0.55-1.36)	1 (ref.)	0.37
Age					
<70 yr	(4776, 133)	0.74 (0.49-1.12)	0.73 (0.48-1.11)	1 (ref.)	0.94
≥70 yr	(2671, 155)	0.68 (0.47-0.99)	0.74 (0.50-1.11)	1 (ref.)	
Diabetes					
No	(3833, 98)	0.69 (0.43-1.12)	0.66 (0.40-1.07)	1 (ref.)	0.88
Yes	(3614, 190)	0.69 (0.50-0.97)	0.74 (0.51-1.06)	1 (ref.)	

R Estruch et al. *N Engl J Med* 2018;378(25): e34

	MeDiet + Extra-Virgin Olive Oil (n = 2364)		MeDiet + Nuts (n = 2108)		Control Diet (n = 1941)	
	Baseline	End of trial	Baseline	End of trial	Baseline	End of trial
	Mean (SD)		*Mean (SD)*		*Mean (SD)*	
Energy (kcal)	2,257 ± 550	2,172 ±475	2,276 ± 527	2,229 ±477	2,186 ± 535	1960 ± 497
Total protein (% E)	16.7 ± 2.8	16.2 ±2.4	16.6 ± 2.7	16.4 ±2.5	16.6 ± 2.8	17.1 ± 3.0
Total carbohydrate (% E)	41.7 ± 7.2	40.4 ±5.9	41.4 ± 7.0	39.7 ±6.3	42.2 ± 7.1	43.7 ± 7.0
Fiber (g/d)	25.7 ± 9.1	25.4 ±7.5	25.7 ± 8.6	27.0 ±8.0	24.7 ± 8.4	23.7 ± 7.7
Total fat (% E)	39.2 ± 6.9	41.2 ±5.4	39.4 ± 6.5	41.5 ±6.1	39.0 ± 7.0	37.0 ± 7.0
Saturated fatty acids (% E)	10.0 ± 2.2	9.4 ±2	10.0 ± 2.1	9.3 ±2.0	10.0 ± 2.3	9.1 ± 2.1
Monounsaturated fatty acids (% E)	19.6 ± 4.6	22.1 ±3.7	19.6 ± 4.3	20.9 ±4.1	19.3 ± 4.7	18.8 ± 4.6
Polyunsaturated fatty acids (% E)	6.1 ± 2.1	6.1 ±1.4	6.4 ± 2.0	7.7 ±1.8	6.2 ± 2.1	5.5 ± 1.7
Linoleic acid, (g/d)	12.9 ± 6.0	12.2 ±4.6	13.6 ± 6.1	16.0 ±5.5	12.6 ± 6.0	10.0 ± 4.8
α- linolenic acid, (g/d)	1.4 ± 0.7	1.3 ±0.7	1.5 ± 0.7	1.9 ±0.7	1.3 ± 0.6	1.1 ± 0.5
Marine n-3 fatty acids (g/d)	0.8 ± 0.5	0.9 ±0.5	0.8 ± 0.5	0.8 ±0.5	0.8 ± 0.5	0.7 ± 0.4
Olive oil (% E)	16.3 ±7.1	22.0 ±6.0	15.9 ± 6.7	17.6 ±6.4	15.8 ± 7.4	16.4 ± 6.8
Nuts (% E)	2.5 ±3.4	2.6 ±3.1	3.3 ± 3.7	8.2 ±4.5	2.4 ± 3.2	1.6 ± 2.5
Cholesterol (mg/d)	363 ± 131	339 ±101	367 ± 117	338 ±99	356 ± 122	32 ± 106

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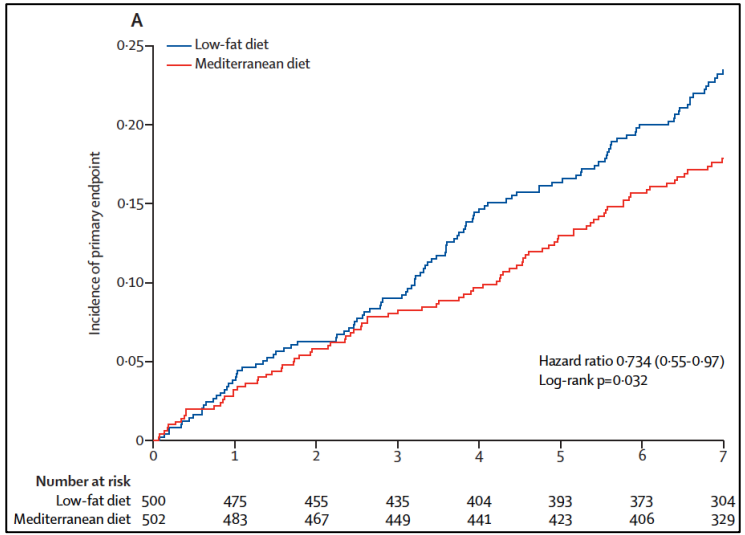
R Estruch et al. *N Engl J Med* 2018;378(25): e34

Long-term secondary prevention of cardiovascular disease with a Mediterranean diet and a low-fat diet (CORDIOPREV): a randomised controlled trial



Subgroup	Low-Fat Diet (N=500)	Mediterranean Diet (N=502)	Hazard Ratio (95% CI)	P-Value for interaction
	No. Of Participants With Primary End-Point Event/Total No. Of Participants			
Sex				0.03
Male	94/413	67/414	0.68 (0.50-0.94)	
Female	17/87	20/88	1.27 (0.64-2.49)	
Age				0.127
<70 Yr	99/453	70/434	0.72 (0.53-0.97)	
>=70 Yr	12/47	17/68	0.99 (0.44-2.24)	
Diabetes				0.373
No	38/216	32/246	0.69 (0.43-1.11)	
Yes	73/284	55/256	0.77 (0.55-1.10)	

Delgado-Lista J et al. *Lancet* 2022;399(10338):1876-1885

Table 4—Quick reference conversion of percent calories from carbohydrate shown in grams per day as reported in the research reviewed for this report

Calories	10%	20%	30%	40%	50%	60%	70%
1,200	30 g	60 g	90 g	120 g	150 g	180 g	210 g
1,500	38 g	75 g	113 g	150 g	188 g	225 g	263 g
2,000	50 g	100 g	150 g	200 g	250 g	300 g	350 g
2,500	63 g	125 g	188 g	250 g	313 g	375 g	438 g

SWEETENERS

Consensus recommendations

- Replace sugar-sweetened beverages (SSBs) with water as often as possible.
- When sugar substitutes are used to reduce overall calorie and carbohydrate intake, people should be counseled to avoid compensating with intake of additional calories from other food sources.

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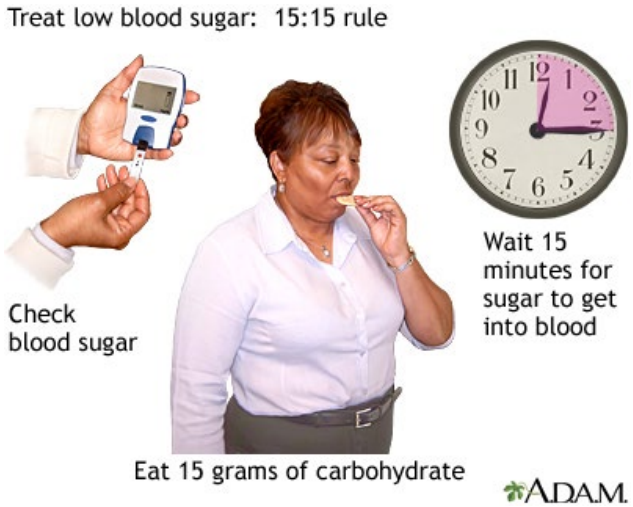
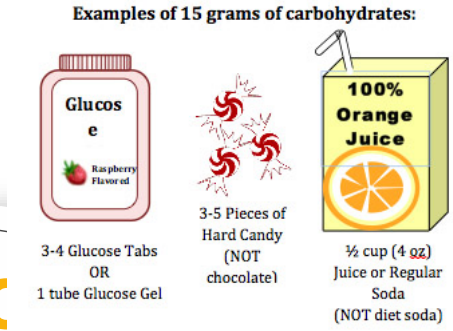
Table 15.1—Levels of hypoglycemia (21)

Level	Glycemic criteria/description
Level 1	Glucose <70 mg/dL (3.9 mmol/L) and glucose ≥54 mg/dL (3.0 mmol/L)
Level 2	Glucose <54 mg/dL (3.0 mmol/L)
Level 3	A severe event characterized by altered mental and/or physical status requiring assistance



1 teaspoon of sucrose = 5 g
1 tablespoon of sucrose = 10-15 g

The 15-15 rule—15 g of carbohydrate to raise blood sugar and check it after 15 minutes. If it's still below 70 mg/dL, needs to have another serving if 15 g and then recheck the blood sugar after 15 minutes



Treatment: The Rule of 15

Do you feel any of the symptoms of hypoglycemia? If so,...

Check your blood sugar. If it is less than 70 mg/dL:

- Eat 15 Grams of Carbohydrates
- Wait 15 minutes and check your blood sugar again.

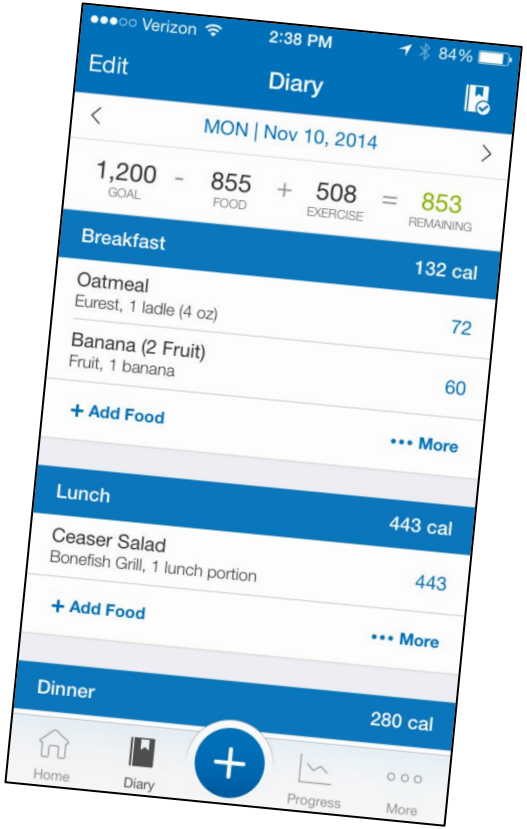
If your blood sugar is still less

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

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

Consensus recommendations

- In general, replacing saturated fat with unsaturated fats reduces both total cholesterol and LDL-C and also benefits CVD risk.
- In type 2 diabetes, counseling people on eating patterns that replace foods high in carbohydrate with foods lower in carbohydrate and higher in fat may improve glycemia, triglycerides, and HDL-C; emphasizing foods higher in unsaturated fat instead of saturated fat may additionally improve LDL-C.
- People with diabetes and prediabetes are encouraged to consume less than 2,300 mg/day of sodium, the same amount that is recommended for the general population.
- The recommendation for the general public to eat a serving of fish (particularly fatty fish) at least two times per week is also appropriate for people with diabetes.



Diabetes Food Hub | American Diabetes Association.

Search recipes

Login Menu

15 min 7 hr 6

20 min 25 min 6

12 min 8 min 4

15 min 8

Instant Pot Chicken Curry Salad

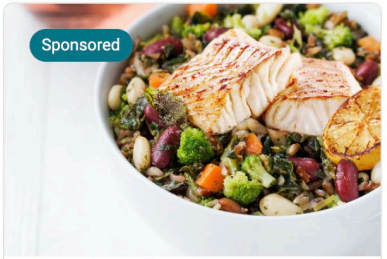
12 min 23 min 4

Buffalo Chicken Legs with Blue Cheese Salad

10 min 20 min 4

Turbot with Watercress and Zucchini

5 min 20 min 4



Cod and Grilled Lemon with So Cal Kale & Bean

5 min 15 min 2

Screenshot

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https://www.diabetesfoodhub.org/featured-recipes.html

Conclusion

- In patients with T2DM, MNT provided by RDNs plays a central role to improve risk factors as well as long-term clinical outcomes:
  - Weight loss is an effective treatment to improve cardiometabolic risk factors although weight regain is common and likely requires long-term follow-up to be prevented. Also, intermittent fasting is not superior to daily caloric restriction with regards to weight loss and glycemic control.
  - High-(healthy) fat diet (i.e., Mediterranean diet) reduce CVD in primary/secondary prevention independent of changes in body weight in patients with and without T2DM, while low-fat diet appear neutral.
- Dietary interventions in T2DM should be personalized based on cultural and personal preferences.
- Dietary counseling should always include education related to the nutritional management of hypoglycemia in T2DM.
- Treat risk factors, treat risk factors, treat risk factors.

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Case

- 60 yo Black AA man with history of severe obesity, T2DM, hypertension, obstructive sleep apnea presents to the cardiopharmaconutrition clinic after seen cardiologist and found to have BP 160/91, HR 85 and progressive weight gain (~5-7 kg/year) and heart failure with preserved ejection fraction.
- Body weight 173.4 kg, height 175cm, BMI 56.2 kg/m^2
- HbA1c is 7.5%, LDL-c 106 mg/dL, TG 167 mg/dL, creat 0.95, eGFR 98. No allergies, however, not in favor of using daily injectable agents for weight loss as they have been proposed to him before. Currently on fosinopril 10mg, chlorthalidone 25mg BID, VitD and metformin 500mg BID (does not tolerate higher dose) and does not want to take any additional medication at this stage.
- Cardiologist adds for primary prevention: Aspirin 81 mg daily and Rosuvastatin 10 mg daily.

What are the goals of medical nutrition therapy?

- Weight loss (caloric restriction, ~600 kcal/day (1800-1900 kcal) based on dietary recall to achieve at least 10% of weight loss within 1 year) to improve BP, HbA1c, and quality of life impairments related to HFpEF.
- Improvements in diet quality (lower added sugars, higher unsaturated fatty acids, sodium control)
- Visit with dietitian every 4 weeks for 6 months, and currently every 6-8 weeks
- Increasing physical activity to improve cardiorespiratory fitness level

Results:

- Results at 12 months: 151 kg (-22 kg, 12.7%), BMI 49.3 kg/m^2, BP 110/70 HR 70, HbA1c 6.9%, LDL 76 mg/dL
- Results at 20 months: 150 kg, BP 118/72 HR 62 (**weight gain prevented!!**), labs mostly unchanged
- Physical activity: not increased
- What's next?

Which Diet is Best for my Patient with Diabetes?

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College of Humanities & Science
Virginia Commonwealth University
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@totocarbone

Questions?

Case Study #2

- Patient is a 62-year-old software engineer, retiring to Thailand with his wife in hopefully late winter of 2022, with type 2 diabetes who presents to follow-up for
  - 1. Type 2 diabetes diagnosed in 2008:
  - Context: Significant aversion to injectable therapy, and confirms this today
  - Severity: Moderate, based on most recent hemoglobin A1c = 9.5% on 03/19/2019, today = 9.7% today
  - Modifying factors: current diabetes regimen is:
    - glipizide (glipiZIDE 10 mg oral tablet)(Rx): 10 mg, PO, twice daily
    - metformin (metFORMIN 1000 mg oral tablet) (Rx): 1,000 mg, PO, twice daily
    - sitagliptin (Januvia 100 mg oral tablet)(Rx): 1 tab, PO, daily
    - previously had adverse reactions to Actos (rash, weight gain, edema)
- Exacerbating factors: Patient reports dietary indiscretions and significantly decreased physical activity due to COVID19 restrictions, although he reports that he is going to be resuming regular physical activity soon with the warmer
- Diet: he has had some success with reducing carbohydrate intake, especially rice, but this has been challenged by recent holiday festivities
- Review of BGs: per recall range 137 - 348
- Associated signs / symptoms: No polyuria or polydipsia, no hypoglycemia or hypoglycemia symptoms
- Exacerbating factors: Lunar New Year celebrations and related dietary indiscretion.
- Patient expresses a strong preference to avoid any injectable medications, but would be open to considering once weekly GLP-1 receptor agonist if needed in the future
- Diabetes related complications include: + Microalbuminuria, and no neuropathy, no diabetic retinopathy
- Last Eye Exam: 2 months ago - no DR

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Case Study #2 cont.

- Current Outpatient Medications:
  - glipiZIDE (Glucotrol) 10 MG tablet, Take 1 tablet by mouth 2 times daily., Disp: , Rfl:
  - hydroCHLOROthiazide (HYDRODiuril) 12.5 MG tablet, Take 1 tablet by mouth daily., Disp: , Rfl:
  - lisinopril (Prinivil, Zestril) 20 MG tablet, Take 1 tablet by mouth daily., Disp: , Rfl:
  - metFORMIN (Glucophage) 1000 MG tablet, Take 1 tablet by mouth 2 times daily., Disp: , Rfl:
  - simvastatin (Zocor) 20 MG tablet, Take 1 tablet by mouth., Disp: , Rfl:
  - SITagliptin (Januvia) 100 MG tablet, See Instructions, TAKE 1 TABLET DAILY, 3 Refills,
- Dispense: 90, tab, Pharmacy EXPRESS SCRIPTS HOME DELIVERY, Disp: , Rfl:
  - ibuprofen 800 MG tablet, Take 1 tablet by mouth 3 times a day as needed., Disp: , Rfl:

Case Study #2 cont.

- Assessment / Plan :
  - 1. Type 2 diabetes, with significant improvement in moderately severe chronic hyperglycemia:
    - no medication changes today per patient preference,
    - Plan to repeat hemoglobin A1c in 3 months, just prior to follow-up virtual visit, he is agreeable to discussing additional medications at that time if no improvement after 3 months of intensive lifestyle modification
    - annual labs overdue, drawn today, see below
  - 2. Hypertension: Condition, uncontrolled, continue HCTZ and increase lisinopril to 40 mg once daily, prescription sent
  - 3. Hyperlipidemia: last LDL at goal, recommended to continue simvastatin 20 mg daily, repeat lipid panel with next lab draw, ordered as below
  - 4. Hypovitaminosis D: Chronic condition, uncertain prognosis, high risk for low vitamin D levels due to very limited time outdoors, repeat today and adjust repletion dose as indicated based on results

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Case Studies

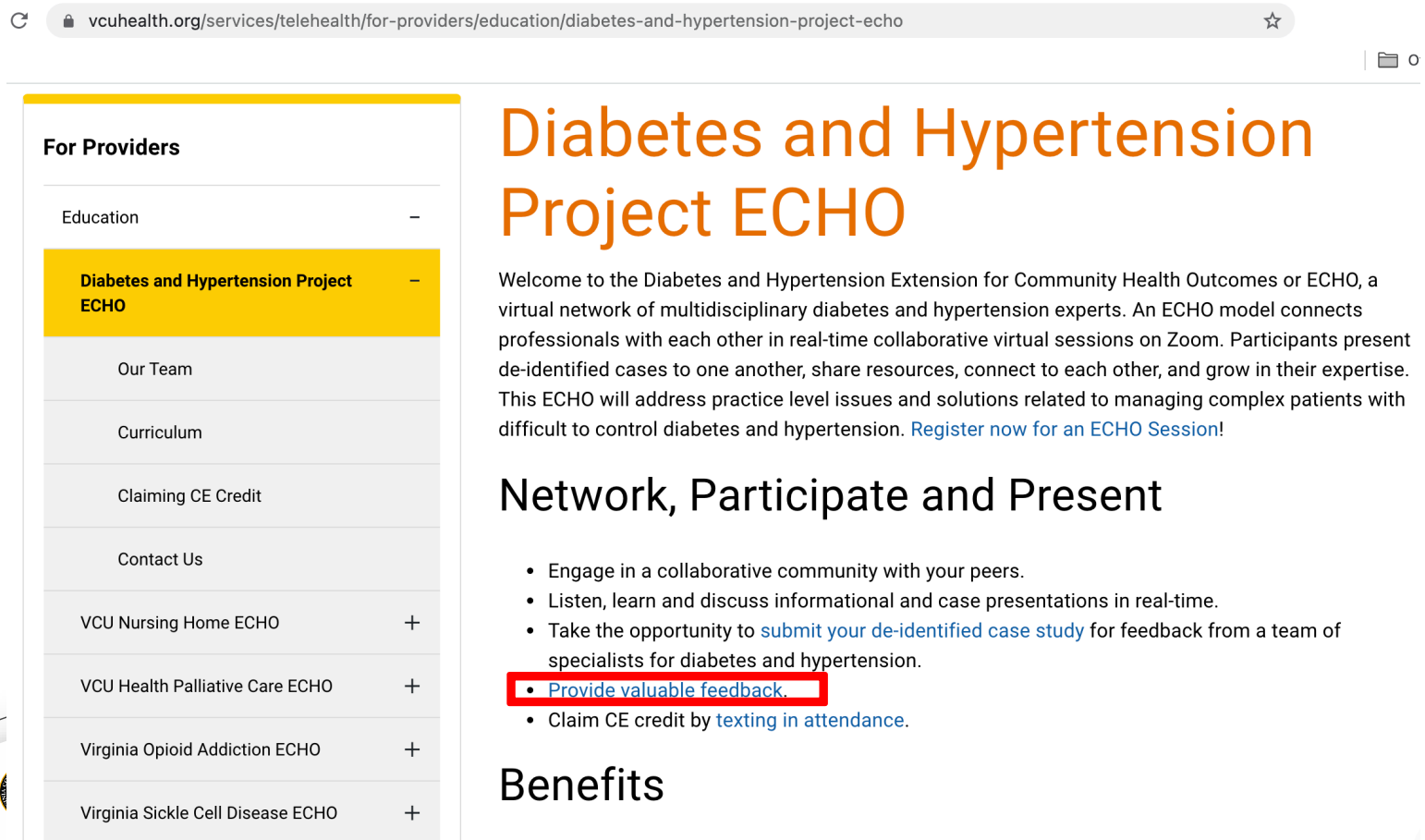
- Anyone can submit cases: www.vcuhealth.org/echodmhtn
- Receive feedback from participants and content experts
- Earn **$150** for submitting and presenting

Provide Feedback

www.vcuhealth.org/echodmhtn

- Feedback
  - Overall feedback related to session content and flow?
  - Ideas for guest speakers?

Send us your feedback



VCU Diabetes & Hypertension Project ECHO Clinics

2nd Thursdays — 12 p.m. to 1 p.m.

Mark Your Calendars — Upcoming Sessions

Summer Break

ECHO to resume August 11

Please register at www.vcuhealth.org/echodmhtn

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Thank you for coming!

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