



Precision Nutrition, Diabetes & Social Isolation

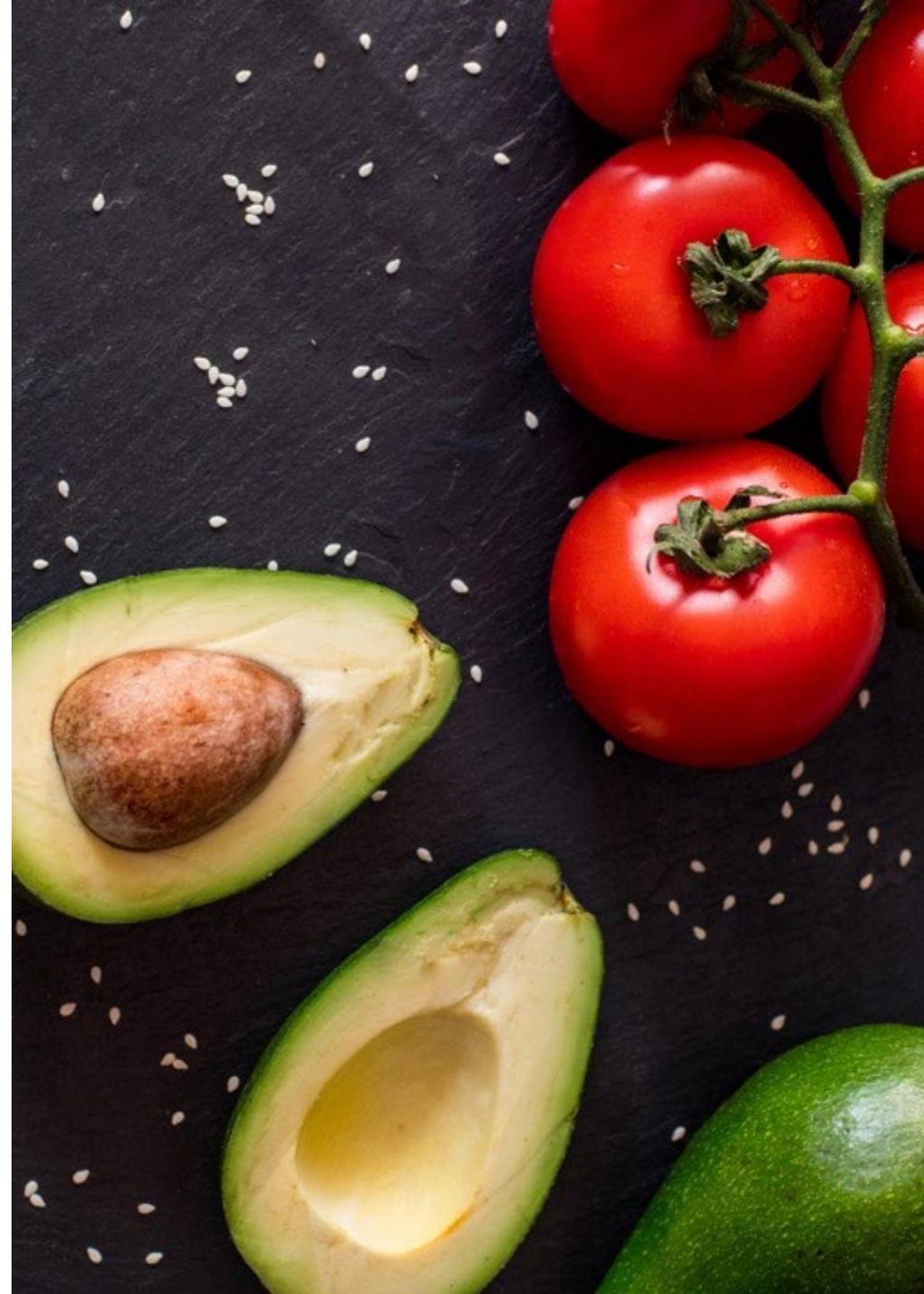
The 5 Key Takeaways for Health Benefits Executives

June 25, 2020



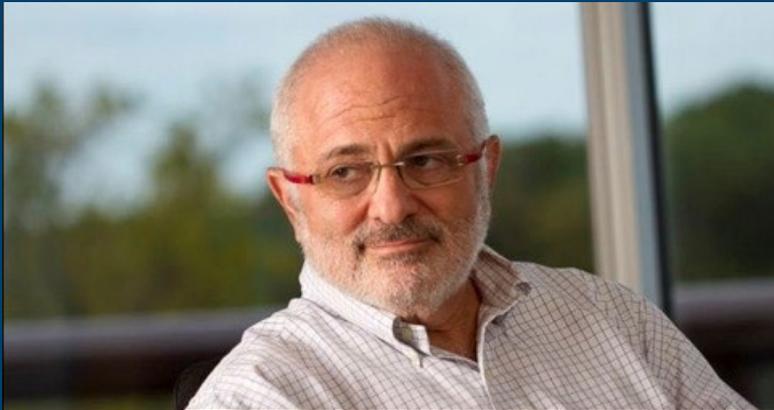
Agenda

- Introductions
- Precision Nutrition: Food As Medicine
- Diabetes & Social Isolation
- 5 Key Takeaways for
 - Employees / Dependents with Diabetes
 - Healthcare Professionals
 - HR & Benefits Executives
- BONUS: Resources for employees
- Q&A



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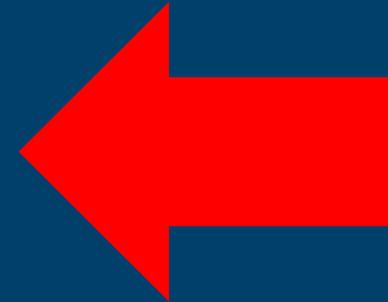
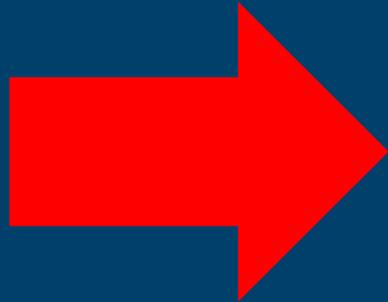
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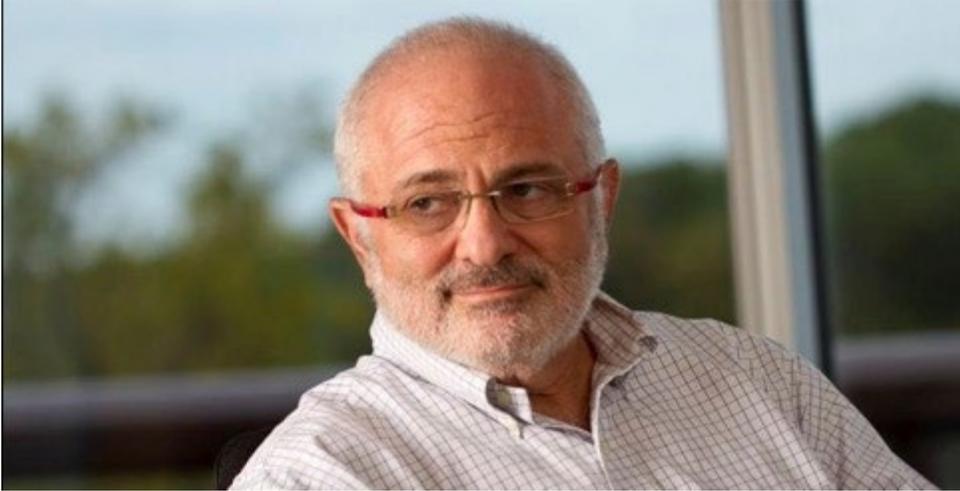
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Today's Presenters

Presenters



Alan Spiro, M.D., F.A.C.N.

is a healthcare leader with over 30 years of experience with Blue Cross Blue Shield, Accolade, Anthem and Willis Towers Watson.



Melinda Maryniuk, MEd, RDN, CDCES

is an award-winning diabetes educator with over 35 years of experience at Joslin Diabetes Center.



DayTwo - the market leader in diabetes remission

DayTwo offers a clinically proven “**food as medicine**” solution that enables a path to **remission for type 2 diabetes**.

DayTwo uses **gut microbiome profiling**, **clinical support** and **telehealth** to deliver success for tens of thousands of **patient members**.

DayTwo is a fee-for-outcome provider and offers up to **100% fees at risk** to obtain blood sugar control.

DayTwo's Clinical Partners



Gerald J. and Dorothy R.
Friedman School of
Nutrition Science and Policy

Disclaimer

This webinar will provide tips and suggestions but these are not meant to be clinical or legal advice.

Please seek the advice of your own medical or legal professionals when making decisions about your company or your employees.

Precision Nutrition: Food as Medicine



Future State: Food Prescriptions

- **Specific**
 - A generic diet that is linked to general guidelines is not enough to be a prescription
- **Individualized**
 - Specific for the person who receives the prescription
- **Based on accurate proven diagnostics**
 - A prescribed diet, should be based on diagnostics just as medication is based on diagnostics, not general advice.
- **Implemented with a CDCES and/or RD**
 - The prescribed diet will require proper counseling to implement and needs the proper professional to help the person with diabetes.

Food As Medicine Studies

10 years of science

Cell

Cell
Metabolism

nature

JAMA

The American Journal of
CLINICAL NUTRITION

Cell Article
Personalized Nutrition by Prediction of Glycemic Responses
Graphical Abstract: A flowchart showing 'Measure personal features for 800 people' leading to 'Predict personal glycemic responses', which then leads to 'Personalized diet' and 'Energy personalized diet to lower glycemic responses'. A 'Personalized' box is in the center, with arrows pointing to 'Dietary intervention' and 'Personalized diet'.
Highlights:

- High inter-personal variability in post-meal glucose observed in an 800-person cohort
- Using personal and microclimate features enables accurate glucose response prediction
- Prediction is accurate and superior to common practices in an independent cohort
- Short-term personalized dietary interventions successfully lower post-meal glucose

Precision Nutrition by Prediction of Glycemic Responses

Cell Metabolism Clinical and Translational Report
Bread Affects Clinical Parameters and Induces Gut Microbiome-Associated Personal Glycemic Responses
Graphical Abstract: A diagram comparing 'Branched bread' and 'White bread'. 'Branched bread' leads to 'Differential effects' (higher fiber, lower glycemic index) and 'Combined effects' (lower glycemic index, higher fiber). 'White bread' leads to 'Differential effects' (lower fiber, higher glycemic index) and 'Combined effects' (higher glycemic index, lower fiber).
Highlights:

- Consumption of bread shows an differential clinical effect of white versus branched bread
- The microclimate composition was generally related to dietary intervention of bread
- The glycemic response to the two types of bread varies greatly across people
- Microclimate-based classifier accurately predicts glycemic response-inducing bread type

Bread Affects Clinical Parameters and Induces Gut Microbiome-Associated Personal Glycemic Responses

ARTICLE
Environment dominates over host genetics in shaping human gut microbiota
Abstract: Emerging evidence suggests that personalized genetic variants (PGVs) that shape the human gut microbiome are more strongly associated with environmental factors than with host genetics. We used a large-scale, multi-omic study to investigate the relative contributions of host genetics and environment to the composition of the human gut microbiome. We found that, in general, there are significant differences in the composition of genetically related individuals who share a household, and that over 90% of the inter-personal genetic variability is associated with factors related to diet, drug, and environmental exposures. We further demonstrate that individuals share significantly higher similarity across the family microbiome, both in genetic and dietary responses, compared to people that do not live together and are genetically unrelated. These findings suggest that environmental factors are a stronger determinant of the human gut microbiome than host genetics.

Environment Dominates Over Host Genetics in Shaping Human Gut Microbiota

JAMA Open
Assessment of a Personalized Approach to Predicting Postprandial Glycemic Responses to Food Among Individuals Without Diabetes
Abstract: Emerging evidence suggests that personalized genetic variants (PGVs) that shape the human gut microbiome are more strongly associated with environmental factors than with host genetics. We used a large-scale, multi-omic study to investigate the relative contributions of host genetics and environment to the composition of the human gut microbiome. We found that, in general, there are significant differences in the composition of genetically related individuals who share a household, and that over 90% of the inter-personal genetic variability is associated with factors related to diet, drug, and environmental exposures. We further demonstrate that individuals share significantly higher similarity across the family microbiome, both in genetic and dietary responses, compared to people that do not live together and are genetically unrelated. These findings suggest that environmental factors are a stronger determinant of the human gut microbiome than host genetics.

Assessment of Precision Nutrition by Prediction of Glycemic Responses

Original Research Communications
Model of personalized postprandial glycemic response to food developed for an Israeli cohort predicts responses in Midwestern American individuals
Abstract: Emerging evidence suggests that personalized genetic variants (PGVs) that shape the human gut microbiome are more strongly associated with environmental factors than with host genetics. We used a large-scale, multi-omic study to investigate the relative contributions of host genetics and environment to the composition of the human gut microbiome. We found that, in general, there are significant differences in the composition of genetically related individuals who share a household, and that over 90% of the inter-personal genetic variability is associated with factors related to diet, drug, and environmental exposures. We further demonstrate that individuals share significantly higher similarity across the family microbiome, both in genetic and dietary responses, compared to people that do not live together and are genetically unrelated. These findings suggest that environmental factors are a stronger determinant of the human gut microbiome than host genetics.

Model of Precision Postprandial Glycemic Response to Food



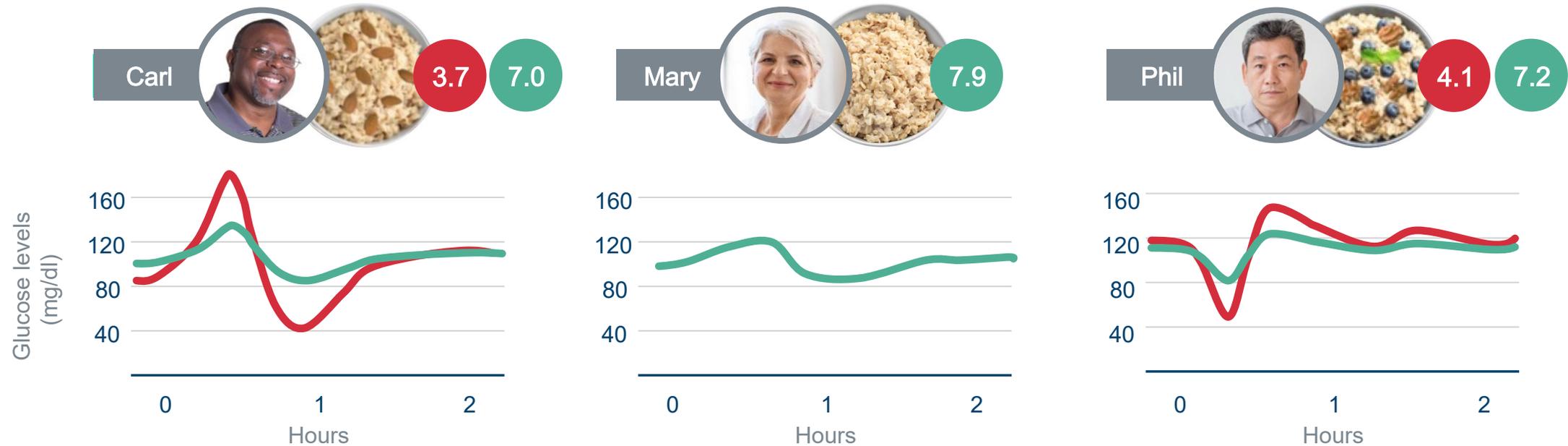
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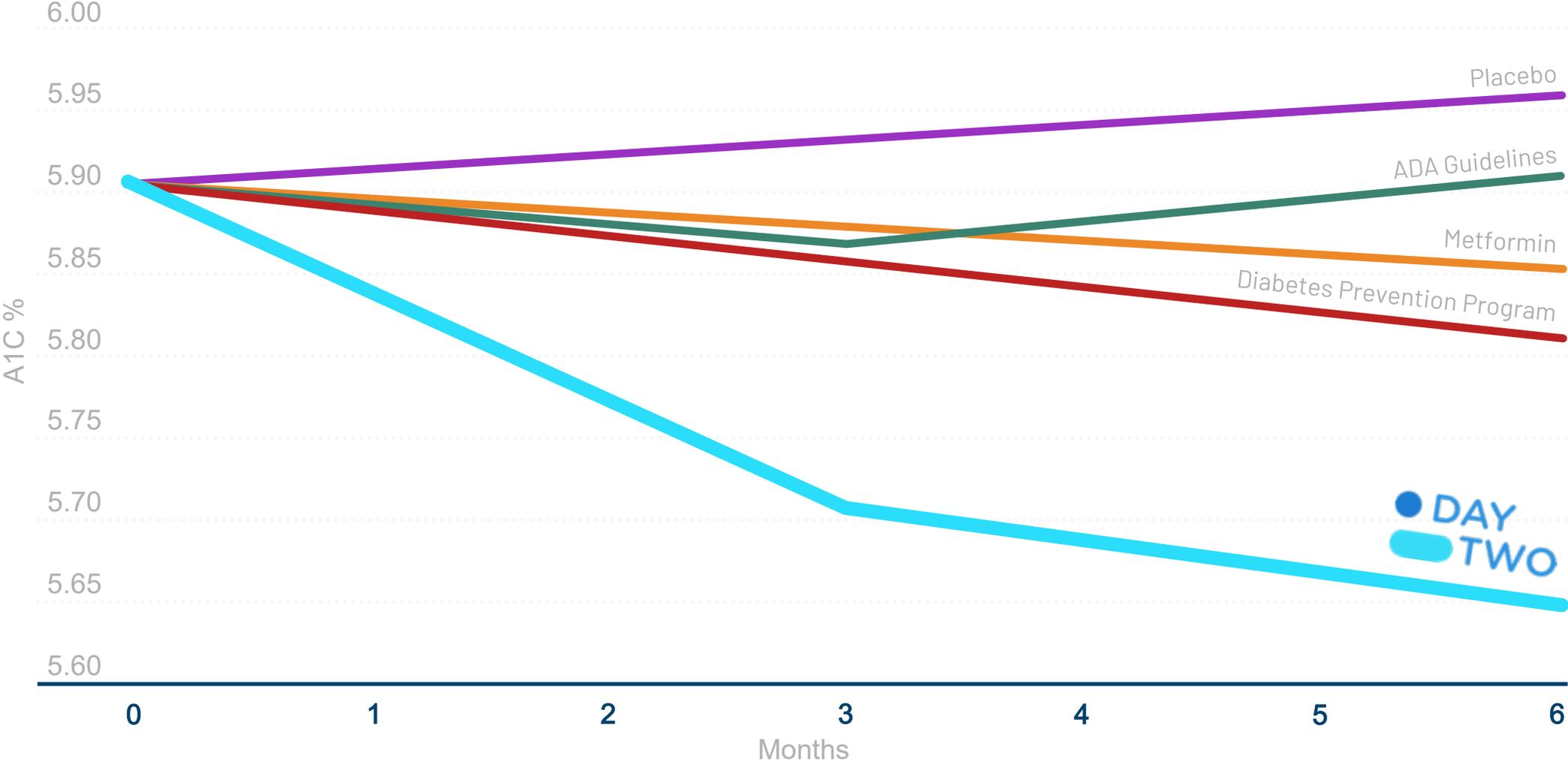
SCIENCE FOR THE BENEFIT OF HUMANITY

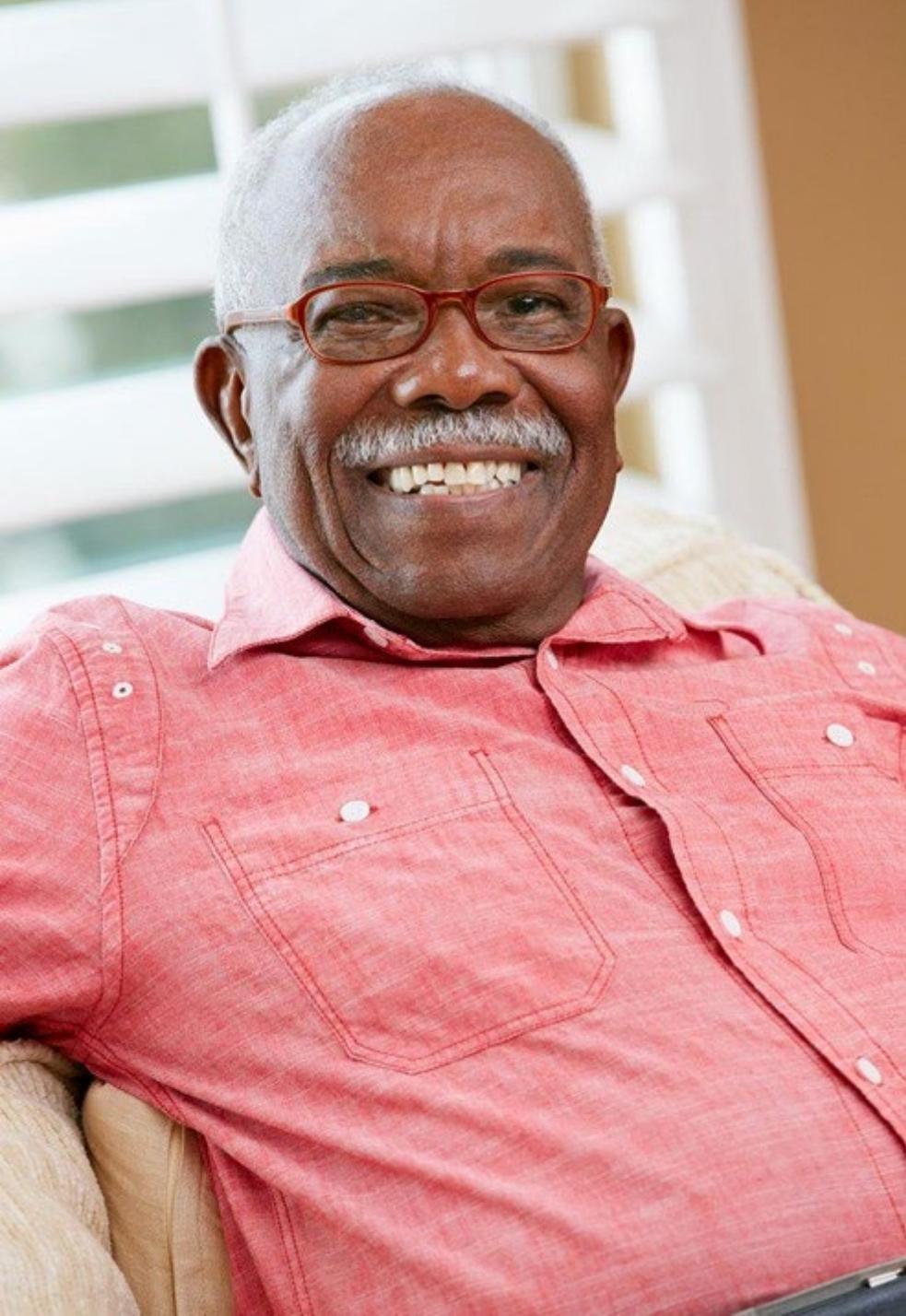
People Respond Differently to the Same Food

Blood Glucose Levels Before and after using DayTwo's microbiome-based predictive algorithm meal recommendations



Food As Medicine is 4x More Effective in Lowering A1C for Diabetes & Prediabetes





Food, Family & Culture: Taking “No” to “Yes”

- Food is family and food is heritage
- Food security means taking cultural competence into account
- Cultural competence and understanding is critical to avoid unconscious bias
- Food Precision requires an understanding of cultural competence

Diabetes & Social Isolation



Reminders: Diabetes & COVID-19

- Transition from acute to chronic / post COVID-19 era
- Diabetes impacts people with COVID-19; 10% of people with diabetes hospitalized for COVID-19 die within 7 days
- Overall in the US, the COVID-19 infection rate is 3 times higher in predominantly black counties than in predominantly white counties, and the mortality rate is 6 times higher
- Older age, men, lower wage employees, those least able to work from home and minorities are at higher risk.
- For some, working from home will be the new norm
- The rigors of managing diabetes can be stressful and lead to symptoms of depression.
- Diabetes can cause complications and health problems that may worsen symptoms of depression

Source: ADA, CDC, NEJM, JAMA, Diabetologia



Risks: social isolation and loneliness

Isolation versus Loneliness

- Social isolation and loneliness are two different but related issues with their own risks

Risk of Stroke

- Socially isolated men have a 90% increased risk of cardiovascular death and more than double the risk of non-fatal stroke

Increase in Mortality

- Social isolation leads to a 29% increase in mortality and loneliness leads to a 26% overall increase in mortality especially in those over 60

Impact to Physical Body

- Social isolation and loneliness cause physical changes in our bodies, not only emotional ones.

Altered Immune Response

- Loneliness is correlated with increased Inflammation and altered immune response

Diabetes & Social Isolation

The 5 Key Takeaways



5 takeaways for people with diabetes

1. Maintain routines

- Daily habits: sleep, eating times, work schedule
- Diabetes care: food, exercise, medications

2. Try something new

- Flexibility: meal planning, exercise, free time
- Creative expression: boosts mental health

3. Health matters

- Realistic understanding of risks
- Pay extra attention to glucose levels; health indicators

4. Acknowledge feelings

- It's hard! Naming a feeling is a first step to managing it.
- Contact info for mental health services

5. Stay connected

- Friends, family, co-workers
- Healthcare team: telehealth visits



5 Takeaways for Healthcare Professionals for Patients

1. Patient monitoring

- Proactively check in more frequently with your at-risk patients

2. Track patient disposition

- Use an online questionnaire to monitor patient mood

3. Assess food security & medication compliance

- Also track patient adherence via a questionnaire

4. Depression screening

- Use PHQ2 or PHQ9 screening tool to assess patients

5. Engage CDCES / RDs

- Make sure patients have help with meal planning & recipes

5 Takeaways for HR & Benefits Executives

1. Prepare for a chronic & post COVID environment

- Consider support groups, employer buddy system
- Investigate training for virtual work

2. Shift resources

- Deploy team building strategies that focus on healthy lifestyle and good eating
- Consider alternative workforce management

3. Facilitate food access & support

- Investigate and provide resources such as food delivery services
- MNT, healthy eating programs (and /or discounts)

4. Promote mental health services

- Consider promotion of virtual mental health resources available

5. Enable & Empower Food As-Medicine

- Incorporate nutrition into diabetes benefits design



Food-As-Medicine -- What You Can Do Today

1. Good: Educate | Communicate Existing Nutrition Benefits

Insight. 75% of people with diabetes are not aware of the nutrition benefits they already have

2. Better: Engage | Promote Coaching & Nutrition Telehealth

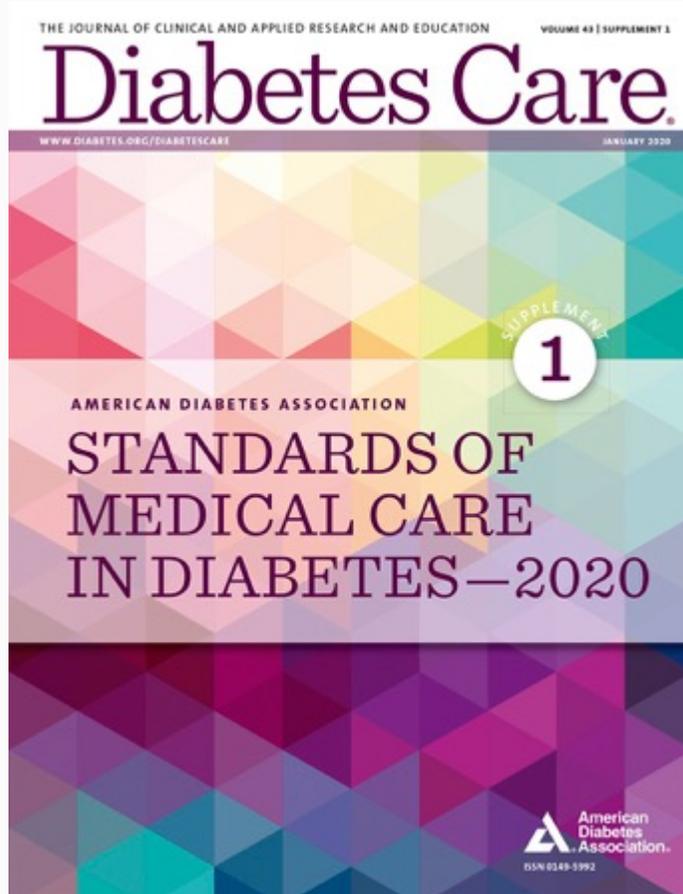
Insight. 92% of people with diabetes do not have a plan or a clinical partner to enable food-as-medicine

3. Best: Empower | Profile Patients for Precision Nutrition

Insight. 95% of people with diabetes use general dietary guidelines, which offer limited clinical impact.



Citations In ADA Evidence Based Standards of Care Now Include Precision Nutrition



Diabetes Care Volume 43, May 2020 781

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

Diabetes Care 2020;43:781-794 | <https://doi.org/10.2337/abc200004>

This Consensus Report is intended to provide clinical professionals with evidence-based guidance about individualizing nutrition therapy for adults with diabetes or prediabetes. Strong evidence supports the efficacy and cost-effectiveness of nutrition therapy as a component of quality diabetes care, including its integration into the medical management of diabetes; therefore, it is important that all members of the health care team know and champion the benefits of nutrition therapy and key nutrition messages. Nutrition counseling that works toward improving or maintaining glycemic targets, achieving weight management goals, and improving cardiovascular risk factors (e.g., blood pressure, lipids, etc.) within individualized treatment goals is recommended for all adults with diabetes and prediabetes.

Though it might simplify messaging, a “one-size-fits-all” eating plan is not evident for the prevention or management of diabetes, and it is an unrealistic expectation given the broad spectrum of people affected by diabetes and prediabetes, their cultural backgrounds, personal preferences, co-occurring conditions (often referred to as comorbidities), and socioeconomic settings in which they live. Research provides clarity on many food choices and eating patterns that can help people achieve health goals and quality of life. The American Diabetes Association (ADA) emphasizes that medical nutrition therapy (MNT) is fundamental in the overall diabetes management plan, and the need for MNT should be reassessed frequently by health care providers in collaboration with people with diabetes across the life span, with special attention during times of changing health status and life stages (1–3).

This Consensus Report now includes information on prediabetes, and previous ADA nutrition position statements, the last of which was published in 2014 (4), did not. Unless otherwise noted, the research reviewed was limited to those studies conducted in adults diagnosed with prediabetes, type 1 diabetes, and/or type 2 diabetes. Nutrition therapy for children with diabetes or women with gestational diabetes mellitus is not addressed in this review but is covered in other ADA publications, specifically *Standards of Medical Care in Diabetes* (5,6).

DATA SOURCES, SEARCHES, AND STUDY SELECTION

The authors of this report were chosen following a national call for experts to ensure diversity of the members both in professional interest and cultural background, including a person living with diabetes who served as a patient advocate. An outside market research company was used to conduct the literature search and was paid using ADA funds. The authors convened in person for one group meeting and actively participated in monthly teleconference calls between February and November 2018. Focused teleconference calls, email, and web-based collaboration were also used to reach consensus on final recommendations between November 2018 and January 2019. The 2014 position statement (4) was used as a starting point, and a search was conducted on PubMed for studies published in English between 1 January 2014 and 28 February 2018 to provide the updated evidence of nutrition therapy interventions in nonhospitalized adults with prediabetes and type 1 and type 2 diabetes. Details on the keywords and the search strategy are reported in the Supplementary Data, emphasizing randomized controlled trials (RCTs), systematic reviews, and meta-analyses of RCTs. An exception was made to the inclusion criteria for the use of real studies for the insulin dosing section. In addition to the search results, in select cases the authors identified relevant research to include in teaching consensus. The

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“...research has shown, for example, the wide interpersonal variability in blood glucose response to standardized meals that could be predicted by clinical and microbiome profiles.”



Resources

Resources

- ADA: www.diabetes.org & ADCES(Telehealth)www.diabeteseducator.org
- UnLonely Project: <https://artandhealing.org/stuckathome/>
- Peer Support:
 - www.diabeteseducator.org/peersupport
 - www.diabeteswhatoknow.com
- Cooking:
 - Cooking Through It:<https://www.epicurious.com/>
 - Milk Street Cooking Classeswww.177milkstreet.com
- Exercise: <https://www.goodhousekeeping.com/health/fitness/a31792038/coronavirus-live-stream-workout-classes/>
- Virtual Games
 - <https://www.jackboxgames.com/>
 - <https://parade.com/1012420/nicolepajer/best-online-games/>

Bonus Resources

- PDF: Tips for Meal Planning Post COVID
- Recording: today's webinar
- Diabetes Benefits Resource Hotline
415-962-4084
- Diabetes Benefits Resource email
Tread.Childs@DayTwo.com



Tips For Meal Planning During COVID-19

This is such an unusual time. It's hard to plan meals since when you get to the store, you may not find what you're looking for. Or if you're waiting on a delivery – you can't be sure when it will arrive or what will be in it! And the easy pantry meal options suggested in many articles (usually a mixture of rice, beans and corn) may be higher in carbs than you'd like. Here are a few tips to help you with meal planning and shopping during this time when we are working hard to stay in place and stay safe. Also included are three recipes for lower-carb entrees that you can try using commonly available ingredients.

Plan meals around what's available – Start with an inventory of what's in your pantry, fridge and freezer. Make your menus based on what you need to use up. You might want to snap a couple of photos of what you have so when you get to the store, if you find you need to alter your plans, you can be reminded of what you have. Have an alternate option for your key items, so if ground beef isn't available - check for ground turkey. If you have several stores in your area, check with friends about which ones seem to have the best selections, or if there is a better day of the week (and time) to go.

Expand your vegetarian meal options – Like most people, you may have been aiming to have at least one vegetarian meal a week before the COVID-19 pandemic began. However, with limited meat options (or not enough room in your freezer), this is a great time to try a few more meatless meal recipes. Three recipes are included below.

Blanch and freeze vegetables - While the shelves of frozen fruits and veggies are often empty when I go to the store, there is usually a good variety of fresh produce. Stock up on fresh veggies and freeze your own. One important tip...

Blanching is a must for veggies to be frozen. It only takes a few minutes and involves dropping veggies into boiling water and then into an ice bath to stop the cooking. This process slows or stops the enzyme action which can cause a loss of flavor, color and texture. Blanching time is important and varies based on the vegetable and size. Lists for blanching times are easy to find on the internet – but here are a couple of times for common veggies. Once blanched and drained, pack away in freezer bags or containers and don't forget to mark the date.

- Spinach / greens – 2 minutes
- Green beans – 3 minutes
- Broccoli and cauliflower florets – 3 minutes
- Carrots, small, whole – 5 minutes

Single layer fruit and veggie freezing – Some produce is best frozen by first laying it out on parchment paper and freezing on a tray in a single layer. This works well for small fruits like berries. It's also a

Questions?

(Submit in the GoTo Webinar Chat)

