



Metabolic Syndrome – COVID-19: Why Americans Need Better Dietary Guidance

PRESENTATION OVERVIEW

1. **Intro**
2. **A Global Perspective on COVID-19 and Pre-Existing Conditions**
3. **Pre-Existing Conditions in the USA**
4. **The US Dietary Guidelines Are Failing Us**
5. **How Reducing Carbohydrates Can Benefit the At-Risk Population**
6. **What Reducing Carbohydrates Actually Looks Like**



SEVERE COVID-19 INFECTION

Scientific understanding of COVID-19 is rapidly increasing

While the likelihood of becoming infected appears to be related to environmental factors, **severe** coronavirus infection appears to be many times more likely in certain subsets of the population



According to the CDC

Are Definitely at Risk For Severe Infection Are Individuals

With:

- Cancer
- CKD
- Immunocompromised from SOT
- Obesity
- Heart Conditions
- Sickle Cell Disease
- Type 2 Diabetes

May Be at Risk For Severe Infection Are Individuals With:

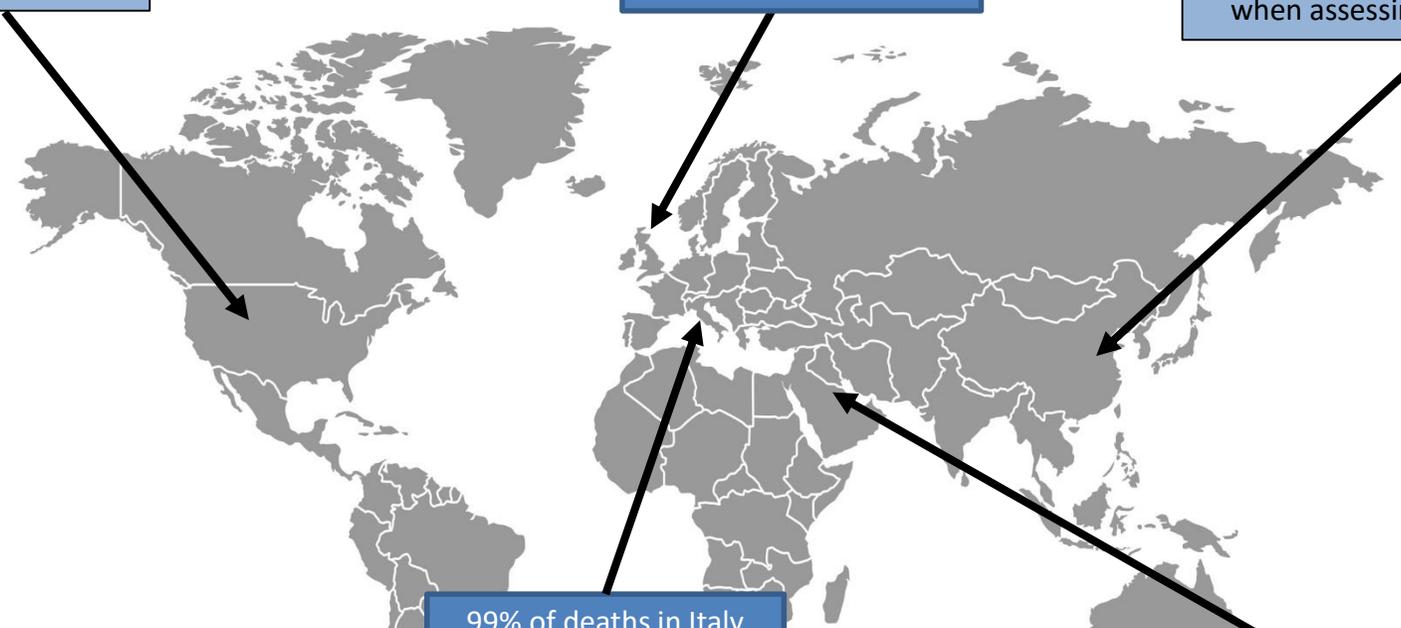
- Asthma
- Cerebrovascular Disease
- Cystic Fibrosis
- Hypertension
- Liver disease
- Pregnancy
- Smoking
- Pulmonary fibrosis
- Immunocompromised for other reasons
- Type 1 Diabetes

PRE-EXISTING HEALTH CONDITIONS - WORLDWIDE

As of May 30th 2020, the Centers for Disease Control and Prevention reported that among COVID-19 cases, the two most common underlying health conditions were cardiovascular disease (32%) and diabetes (30%).

Two-thirds of people in the UK who have fallen seriously ill with COVID-19 were overweight or obese

The death rate reported by the Chinese Center for Disease Control for more than 70,000 cases was 2.3%, but this was increased to 7.3% when assessing diabetic patients

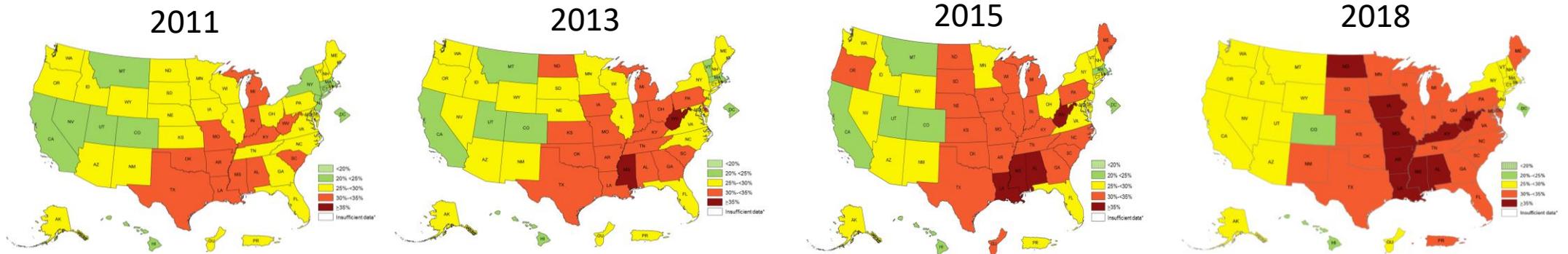


99% of deaths in Italy have been in patients with pre-existing conditions, such as hypertension, diabetes and heart disease

Patients with diabetes had an odds ratio (OR) of 7.2 to 15.7 for severe or critical type of MERS-CoV infection, with a relative high 35% rate of mortality



METABOLIC HEALTH IN THE UNITED STATES



DIABETES

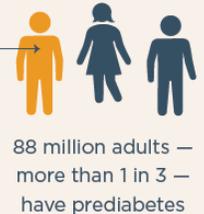
**34.2
MILLION**

34.2 million people have diabetes

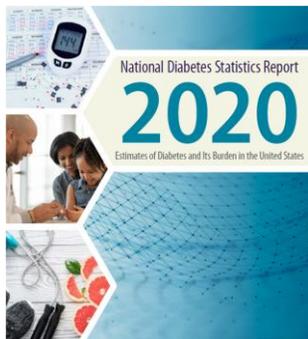


PREDIABETES

**88
MILLION**



**MORE THAN
8 IN 10**
adults don't know they have prediabetes



NHANES data indicates 12% of Americans are considered “metabolically healthy”

52% of US adults have diabetes or prediabetes

Over 70% of the population is overweight or obese



HOSPITALIZATION IN THE UNITED STATES

- **The USA:** Approximately 90% of hospitalized patients in the United States had one or more underlying conditions, the most common being obesity, hypertension, chronic lung disease, diabetes mellitus, and cardiovascular disease

Hospitalizations were six times higher among patients with a reported underlying condition (45.4%) than those without reported underlying conditions (7.6%).

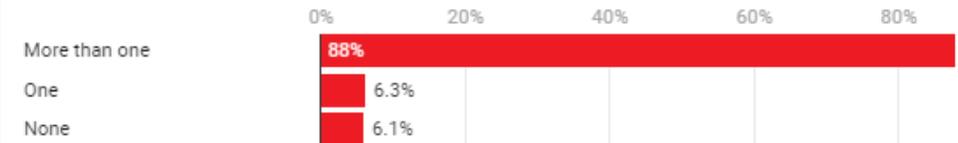
Deaths were 12 times higher among patients with reported underlying conditions (19.5%) compared to those without reported underlying conditions (1.6%).



The most common health problems among hospitalized COVID-19 patients

Based on a study of 5,700 patients in the New York City Area

Of all hospitalized patients, 88% had more than one comorbidity:



Specific comorbidities of hospitalized patients with available EHR data, from most common to least:

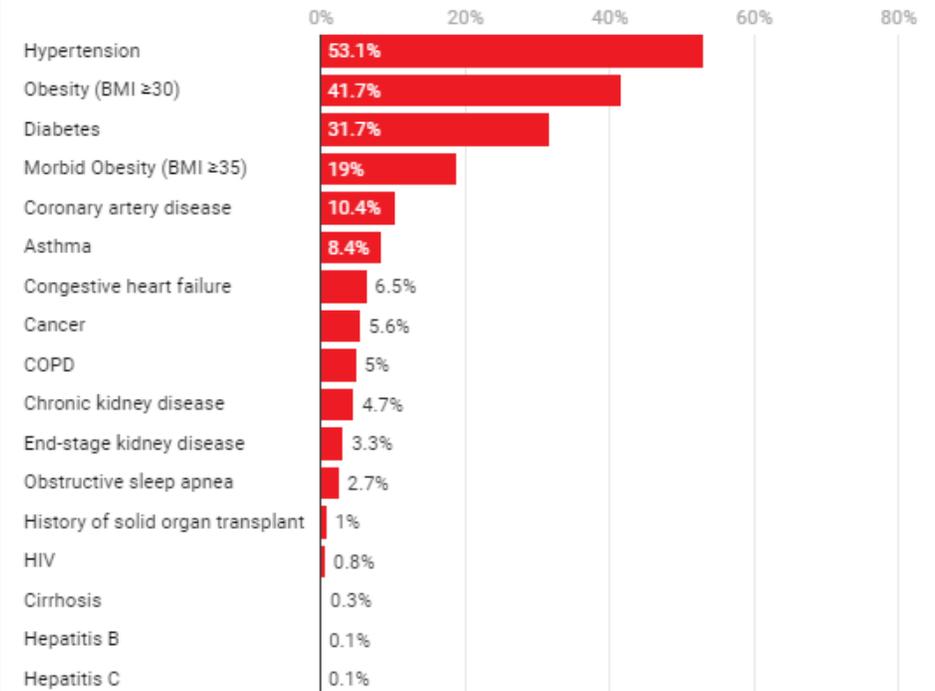


Chart: Elijah Wolfson for TIME • Source: JAMA Network • Get the data • Created with Datawrapper

https://www.cdc.gov/mmwr/volumes/69/wr/mm6924e2.htm?s_cid=mm6924e2_w

<https://www.cdc.gov/mmwr/volumes/69/wr/mm6915e3.htm>

OBESITY AS A RISK FACTOR

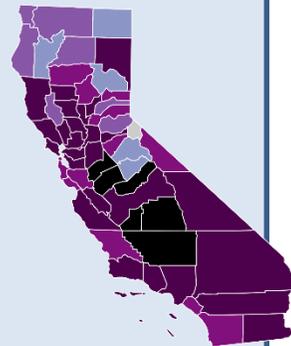
Obesity has previously been identified as a risk factor for severe viral infections due to its influence on immune response

Increased Risk of Severe COVID-19 Infection



A study in NY that followed 4103 patients with COVID-19, of which 1999 (48.9%) were hospitalized, it was observed that individuals with BMI > 40 kg/m² were six times more likely to be hospitalized

“Among 6916 patients with COVID-19, there was a J-shaped association between BMI and risk for death, even after adjustment for obesity-related comorbidities.” – Tartof 2020



Decreased Vaccination Efficacy

Vaccines engineered to protect from influenza, hepatitis B, tetanus and rabies can be less effective in obese adults than in the general population, leaving them more vulnerable to infection and illness.



RESEARCH ARTICLE



Obesity Outweighs Protection Conferred by Adjuvanted Influenza Vaccination

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DIABETES AS A RISK FACTOR



Data from US CDC suggests that people with diabetes make up about 10% of the cases of COVID-19.

However, COVID severity in people with diabetes is much greater. More than 30 studies have examined the contribution of type 2 diabetes to risk of severe infection with COVID-19.



Meta-analyses of these studies demonstrates that the odds of developing a severe COVID infection requiring hospitalization are 2-3-fold higher if you have diabetes. Mortality risk is also significantly higher.

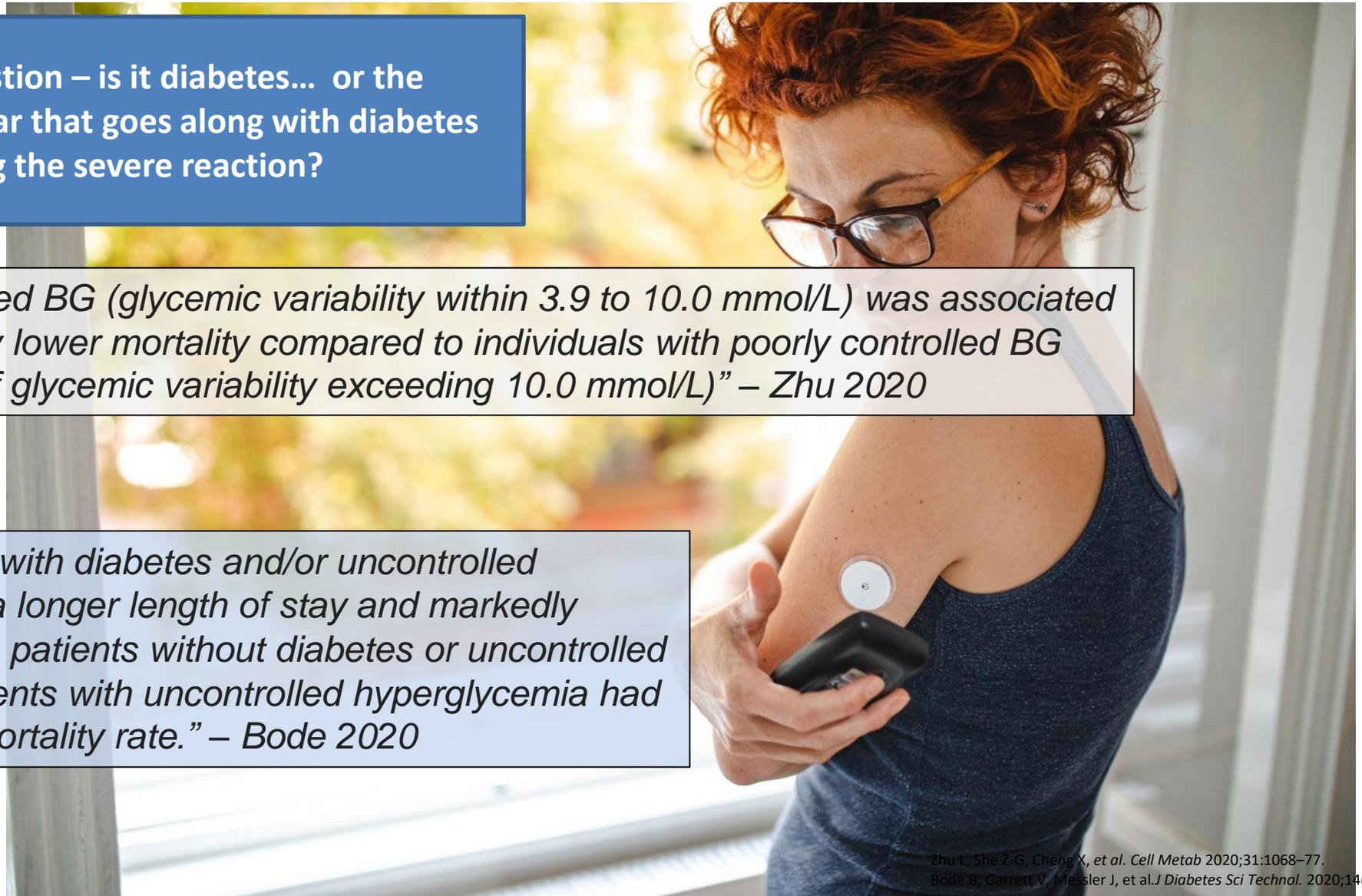


DIABETES OR UNCONTROLLED BLOOD SUGAR?

One important question – is it diabetes... or the uncontrolled blood sugar that goes along with diabetes that is driving the severe reaction?

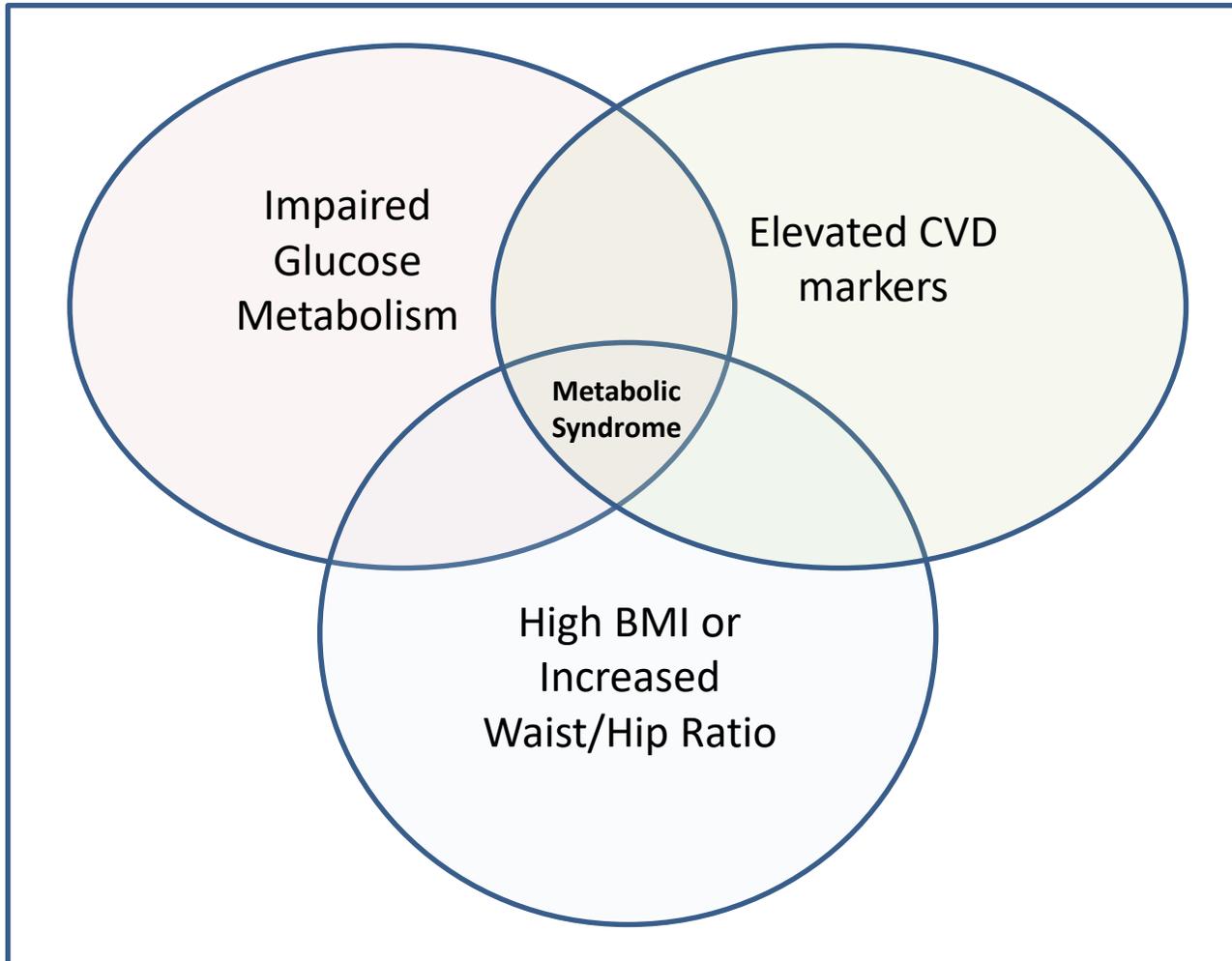
“Well-controlled BG (glycemic variability within 3.9 to 10.0 mmol/L) was associated with markedly lower mortality compared to individuals with poorly controlled BG (upper limit of glycemic variability exceeding 10.0 mmol/L)” – Zhu 2020

“COVID-19 patients with diabetes and/or uncontrolled hyperglycemia had a longer length of stay and markedly higher mortality than patients without diabetes or uncontrolled hyperglycemia. Patients with uncontrolled hyperglycemia had a particularly high mortality rate.” – Bode 2020



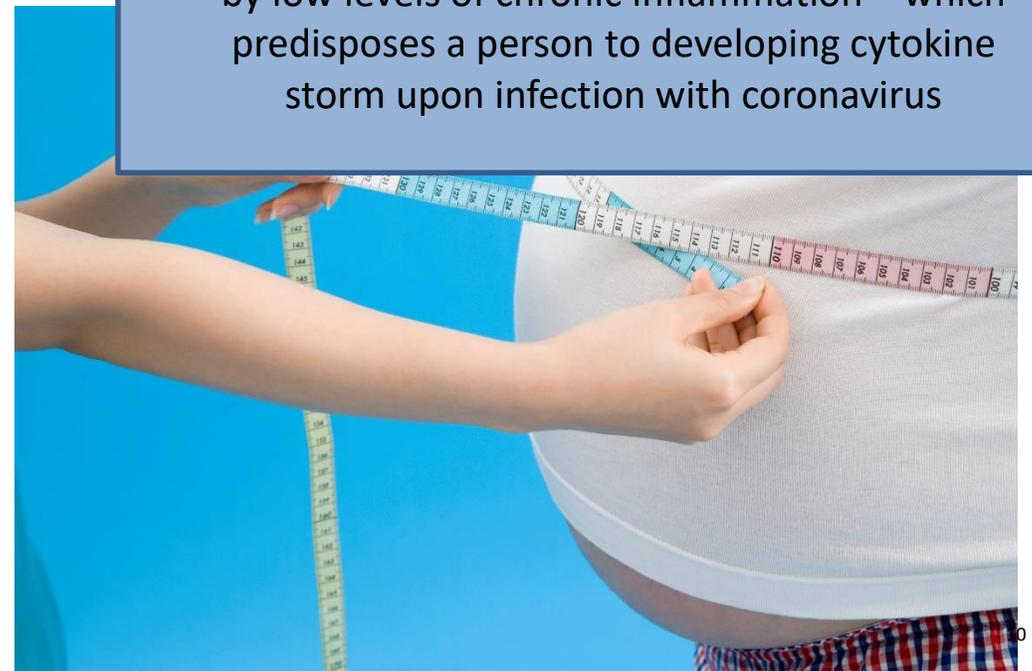
METABOLIC SYNDROME AND INFLAMMATION

These risk factors have one major commonality – they are all part of a cluster of conditions known as metabolic syndrome



Metabolic syndrome is the manifestation of insulin resistance and its effects on different parts of the body

Metabolic syndrome is frequently accompanied by low levels of chronic inflammation – which predisposes a person to developing cytokine storm upon infection with coronavirus



US DIETARY GUIDANCE

The US Dietary Guidelines Advisory Committee just released their 2020-2025 recommendations

Of note is that during a time where we are well aware of how diet-related diseases predispose individuals to a severe coronavirus infection – and when only 12% of the US population is metabolically healthy – the USDA has stated that **the US Dietary Guidelines are intended ONLY for healthy Americans.**

Studies enrolling exclusively unhealthy people or studies focused on weight-loss were completely excluded from the Advisory Committee’s review of the literature



One committee member took issue with this narrow focus, querying the USDA staff: “But if you excluded such people [with a particular disease condition]...that would not actually be representative of who lives in this country”

REDUCING CARBOHYDRATES

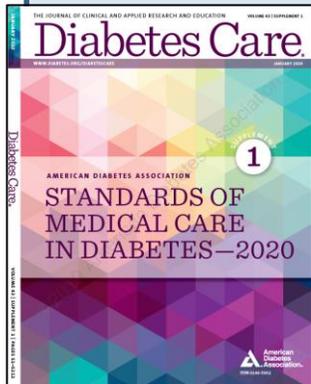
*“Among popular named diets, those with the largest effect on weight reduction and blood pressure in comparison with usual diet were Atkins (weight **5.5 kg**, systolic blood pressure 5.1 mm Hg, diastolic blood pressure 3.3 mm Hg), DASH (**3.6 kg**, 4.7 mm Hg, 2.9 mm Hg, respectively), and Zone (**4.1 kg**, 3.5 mm Hg, 2.3 mm Hg, respectively) at six months (all moderate certainty).”*

RESEARCH

OPEN ACCESS [Check for updates](#)

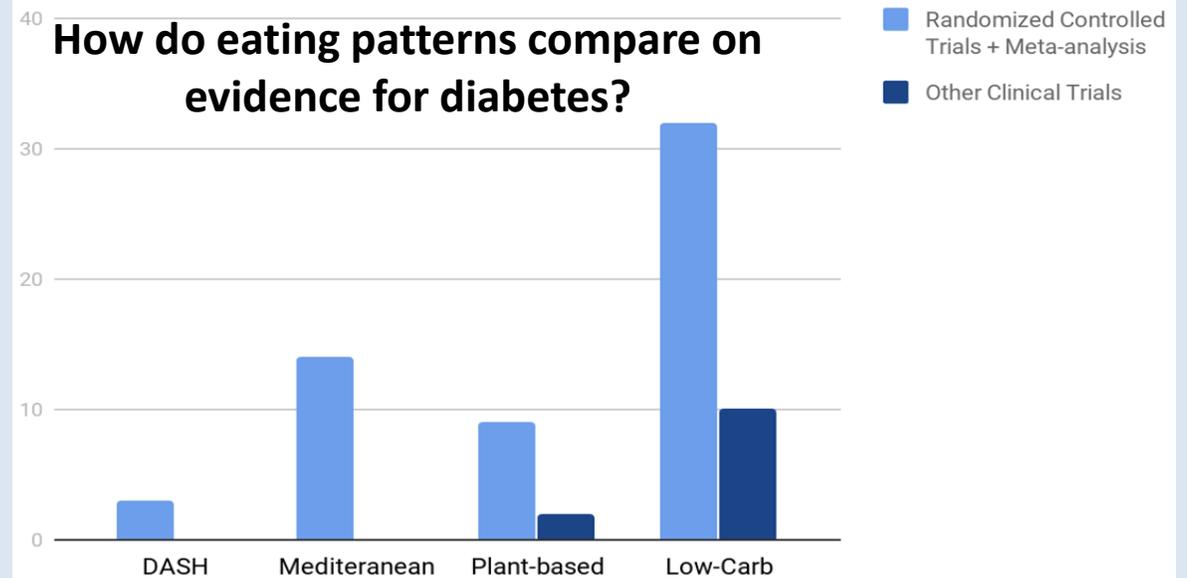
Comparison of dietary macronutrient patterns of 14 popular named dietary programmes for weight and cardiovascular risk factor reduction in adults: systematic review and network meta-analysis of randomised trials

Long Ge,^{1,2,3} Behnam Sadeghirad,^{3,4} Geoff D C Ball,⁵ Bruno R da Costa,^{6,7,8} Christine L Hitchcock,^{5,9} Anton Svendrovski,⁹ Ruhi Kiflen,³ Kalimullah Quadri,¹⁰ Henry Y Kwon,¹¹ Mohammad Karamouzian,^{12,13} Thomasin Adams-Webber,¹⁴ Waleed Ahmed,¹⁵ Samah Damanhoury,¹⁶ Dena Zeraatkar,³ Adriani Nikolakopoulou,¹⁷ Ross T Tsuyuki,¹⁸ Jinhui Tian,¹⁹ Kehu Yang,^{1,19} Gordon H Guyatt,³ Bradley C Johnston^{3,9,20}

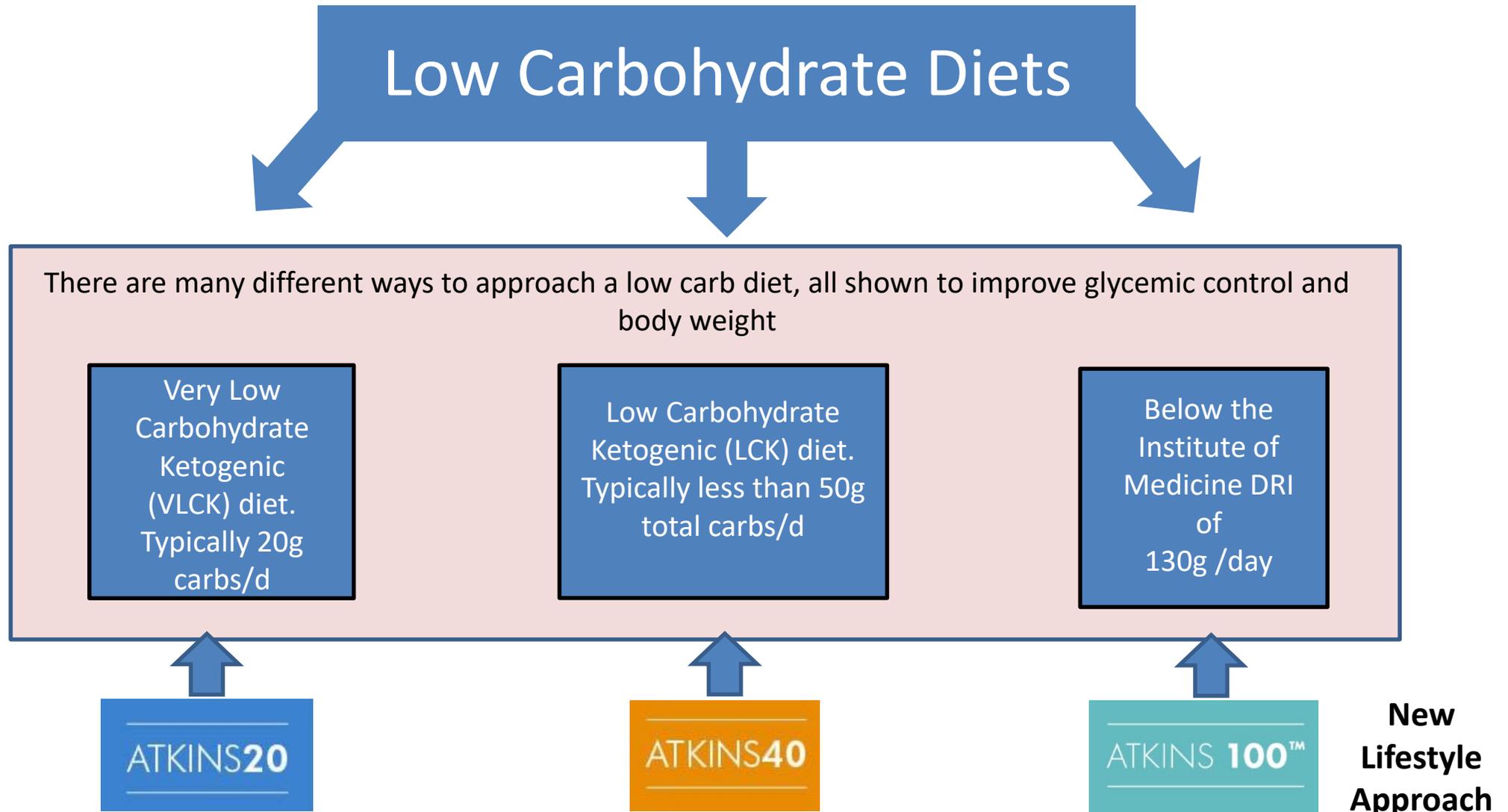


*“Reducing overall carbohydrate intake for individuals with diabetes has demonstrated **the most evidence for improving glycemia** and may be applied in a variety of eating patterns that meet individual needs and preferences...”*

Number of studies



THE LOW CARB SPECTRUM



A DAY OF ATKINS 100

ATKINS 100™

Each day, you'll enjoy a wide variety of delicious and filling foods. Allocate 100 net carbs throughout the day as follows:

3 Meals Per Day
25g 25g 25g

2 Snacks Per Day
10 to 15g 10 to 15g

FOUNDATION VEGETABLES
6 to 8 servings

12-15g Net Carbs



PROTEIN
3 servings (4 – 6 oz. per serving)

0g Net Carbs



ADDED FATS
2-4 servings (1 TBSP each)

0g Net Carbs



OTHER CARBOHYDRATES
3 – 5 servings

85g Net Carbs




Breakfast = 22g Net Carbs

Red Bell Pepper Rings Filled with Egg and Mozzarella, 1/2 cup Cooked Oatmeal, 1/4 cup Blueberries



Morning Snack = 8g Net Carbs

4oz Greek Yogurt, 5 large Strawberries



Lunch = 32g Net Carbs

Beef Burger with Feta and Tomatoes, Whole Wheat bun, Mixed Greens & Celery, Cherry Tomatoes, Chickpeas, Greek Vinaigrette



Afternoon Snack = 9g Net Carbs

2tbsp Hummus, 1 Carrot



Dinner = 27g Net Carbs

Blackened Salmon with Cucumber Relish and Cauliflower, 1/2 cup wild rice, 1 cup mixed salad greens, 1/2 cup chopped red bell pepper, garlic ranch dressing

Atkins products have been demonstrated to have a low glycemic load – they have a minimal impact on blood sugar

The primary carbohydrates in Atkins products are typically fibers or low glycemic sweeteners

No added sugars

Nutrition & Metabolism



Methodology

Open Access

Equivalent glycemic load (EGL): a method for quantifying the glycemic responses elicited by low carbohydrate foods

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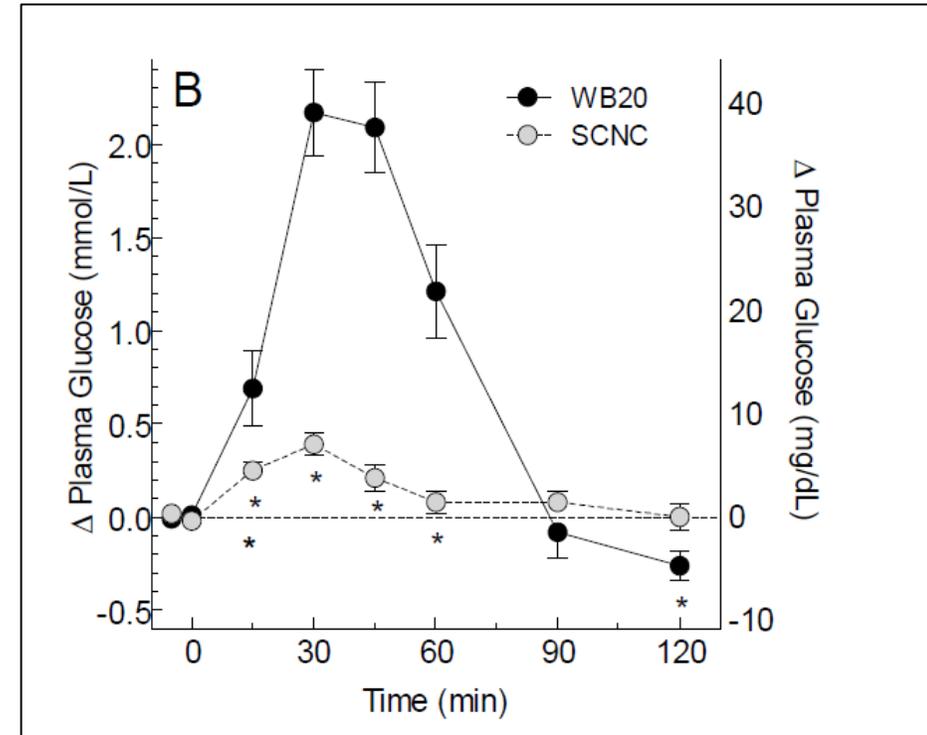
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WELL-FORMULATED LOW CARB EATING

When following the Atkins eating approach you should be getting 12-15 grams of net carbs from vegetables

That's 6-8 servings of vegetables per day!

A two week meal plan for Atkins 100 – supplies an average of 30g of dietary fiber per day



ATKINS 100[®]
Standard Menu Plan

Notes: _____

| | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY | SUNDAY |
|------------------|--|---|--|--|--|--|--|
| BREAKFAST | 1 serving Almond-Pineapple Smoothie [®] Net Carbs 10g+*FV 0g | 1 serving Barista Frittata [®] 1/2 medium apple Net Carbs 15g+*FV 0g | Atkins Dark Chocolate Royale Shake Blended with: 3/4 cup frozen riced cauliflower 1/2 cup blueberries 1/4 cup chilled cooked steel cut oats Net Carbs 24g+*FV 2g | 1 serving Protein Power [®] Oatmeal [®] 1/2 cup blueberries Net Carbs 24g+*FV 0g | Atkins Cranberry Almond Bar 1/2 cup plain unsweetened Greek yogurt 1/2 cup cubed cantaloupe Net Carbs 20g+*FV 0g | 1 serving Almond Protein Pudding with Blueberries [®] 1 canned peach (no sugar added) Net Carbs 10g+*FV 0g | 1 serving Dreamless Broccoli Quiche [®] 1/3 cup cooked steel cut oats Net Carbs 22g+*FV 4g |
| SNACK | Atkins Lemon Vanilla Protein Water Crisp Bar 1/2 cup grapes Net Carbs 10g+*FV 0g | Atkins Creamy Vanilla Shake Net Carbs 2g+*FV 0g | Atkins Cranberry Almond Bar 1/2 cup plain unsweetened Greek yogurt Net Carbs 10g+*FV 0g | Atkins Lemon Vanilla Protein Water Crisp Bar Net Carbs 4g+*FV 0g | 1 serving Blueberry Cinnamon Muffin [®] Net Carbs 10g+*FV 0g | Atkins Mocha Latte Shake & 1 Banana Coconut Muffin [®] Net Carbs 10g+*FV 0g | Atkins Dark Chocolate Royale Shake & 1 Banana Coconut Muffin [®] Net Carbs 10g+*FV 4g |
| LUNCH | 1 serving Lettuce-Wrapped Chicken Veggie Burger with Tomato and Hamanas [®] 1 tbsp mayonnaise 0 pieces baked sweet potato fries Net Carbs 25g+*FV 4g | 1 serving Teriyaki Salmon Salad [®] 1 large whole grain pita bread Net Carbs 22g+*FV 0g | 1 serving Chicken Salad Sandwich with Quinoa and Walnuts [®] 3/4 cup sliced cucumber 1/2 cherry tomatoes 1 tbsp bottled Italian dressing Net Carbs 10g+*FV 0g | 1 serving Chicken, Red Onion and Blueberry Pasta Salad [®] 1/2 medium cucumber Net Carbs 22g+*FV 0g | 1 serving Tuna-Cheese Salad [®] with 1/2 medium cucumber 2 Tbsp Creamy Italian Dressing [®] 1/2 cup steamed sweet potato 1 whole wheat tortilla Net Carbs 45g+*FV 0g | 1 serving Broccoli Florets with Lemon Butter Sauce [®] 4 oz roasted chicken 1/2 cup brown rice Net Carbs 25g+*FV 0g | 1 serving Warm Asahi Beef Salad [®] Net Carbs 10g+*FV 14g |
| SNACK | Atkins Mocha Latte Shake 1 oz cheddar Net Carbs 4g+*FV 0g | Atkins Lemon Bar Net Carbs 3g+*FV 0g | 1/2 medium sweet potato, baked and sliced 1/4 cup sour cream 1 tbsp chopped green onions Net Carbs 15g+*FV 10g | Atkins Dark Chocolate Royale Shake 1 small apple Net Carbs 15g+*FV 0g | Atkins Creamy Vanilla Shake Net Carbs 10g+*FV 0g | Atkins Chocolate Banana Shake 1/2 cup grapes Net Carbs 10g+*FV 0g | Atkins Lemon Bar 1 small apple Net Carbs 15g+*FV 0g |
| DINNER | 1 serving Sliced Bok Choy and Tofu [®] 1/2 cup cooked brown rice 2 tbsp butter Net Carbs 30g+*FV 11g | 1 serving Sausage and Peppers over Pasta [®] 2 cups shredded Romano [®] 2 cherry tomatoes 1 slice red onion 2 pepperoncini 2 tsp bottled Italian dressing Net Carbs 37g+*FV 14g | 1 serving Egg Roll Bowl with Shrimp [®] 1/2 cup brown rice Net Carbs 30g+*FV 0g | 1 serving Falafel Steak and Frenk Gaucando [®] 1/2 cup cooked brown rice Net Carbs 34g+*FV 0g | 1 serving Grilled Peas, Sausage and Tomato Pasta [®] & 1 serving Easy Pepper and Zucchini Sauté [®] Net Carbs 35g+*FV 0g | 1 serving Tantal-Lemon Pork Loin with Snap Peas [®] & 1 serving Asian Vegetable Noodles [®] Net Carbs 30g+*FV 20g | 1 serving Beef Enchilada Topped with an Egg over Spaghetti Squash [®] 2 6-inch corn tortillas Net Carbs 36g+*FV 11g |
| | Total Net Carbs: 19g Foundation Vegetables: 17g | Total Net Carbs: 92g Foundation Vegetables: 22g | Total Net Carbs: 19g Foundation Vegetables: 27g | Total Net Carbs: 92g Foundation Vegetables: 15g | Total Net Carbs: 100g Foundation Vegetables: 20g | Total Net Carbs: 92g Foundation Vegetables: 17g | Total Net Carbs: 92g Foundation Vegetables: 15g |

*Go to [Atkins.com/recipes](https://www.atkins.com/recipes) for recipes!



MODERATE CARBOHYDRATE RESTRICTION SHOWS EFFICACY

Open Access

Original research

BMJ Open
Diabetes
Research
& Care

Systematic review and meta-analysis of dietary carbohydrate restriction in patients with type 2 diabetes

Ole Snorgaard,¹ Grith M Poulsen,² Henning K Andersen,³ Arne Astrup²

Conclusions from Snorgaard et al. 2017:

Both the carbohydrate-restricted and low-fat diets were able to produce clinically meaningful HbA1c reductions of $\geq 0.5\%$,

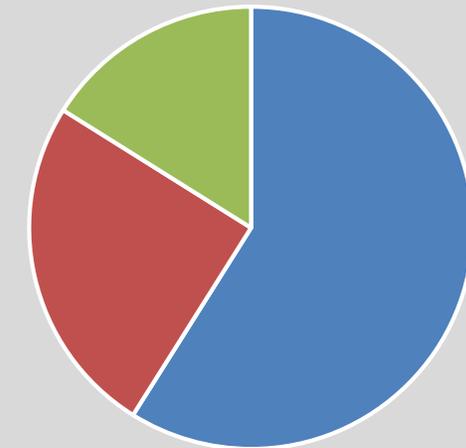
Upon subgroup analysis

Carbohydrate (<26% of energy) produces the greatest reductions

Carbohydrate of 26-45% of total energy provides no additional benefits over low-fat diets – keep in mind these were still improvements from baseline

While few studies have directly compared the effectiveness of moderate carbohydrate restriction with more extreme forms, Hyde et al. and Harvey et al. show beneficial effects on metabolic syndrome and weight-loss, respectively – though not as significant as observed at higher levels of restriction, adherence to the intervention is better at this level.

Total



■ VLCKD (20g CHO) ■ LCKD (40g CHO) ■ LCD (130g CHO)

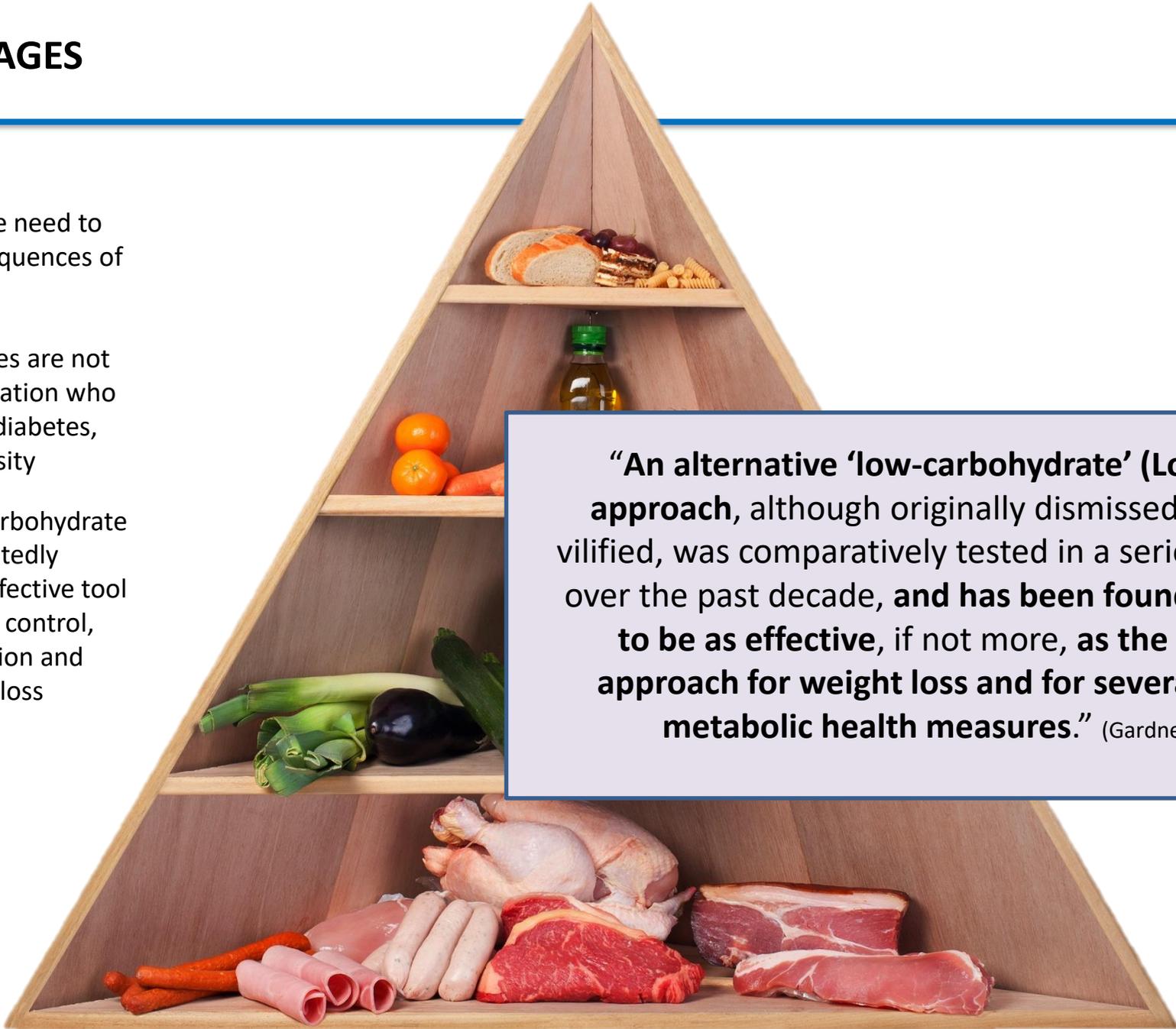


TAKE-HOME MESSAGES

Now more than ever we need to address the health consequences of poor nutrition

The US Dietary Guidelines are not intended to help a population who are suffering from prediabetes, diabetes and obesity

A **well constructed** low carbohydrate diet has been repeatedly demonstrated to be an effective tool for improving glycemic control, decreasing inflammation and facilitating weight loss



“An alternative ‘low-carbohydrate’ (Low-Carb) approach, although originally dismissed and even vilified, was comparatively tested in a series of studies over the past decade, and has been found in general to be as effective, if not more, as the Low-Fat approach for weight loss and for several related metabolic health measures.” (Gardner 2012)