

## Reversal of Metabolic Syndrome and Obesity in US Veterans

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### Background:

Veterans who receive care in Veterans Health Administration experience and suffer from a higher burden of obesity and diabetes compared to non-Veteran populations. The human and economic costs are staggering as reflected in the recent 2020 Obesity VA/DoD Clinical Practice Guideline Management of Adult Overweight and Obesity and the newly revised 2023 VA/DoD Clinical Practice Guideline Management of Type 2 Diabetes Mellitus.

*Compared with the general U.S. population, the combined prevalence of overweight (37%) and obesity (41%) is higher in Veterans receiving care in the VA. This current combined prevalence in Veterans of 78% reflects a steady increase over the past two decades, up from 64% in 1996.<sup>1</sup>*

*Overall, approximately one in eight American adults has diabetes, and about one in three has prediabetes, many of whom are unaware of their diagnosis.... According to the VHA, nearly one in four Veterans (1.6 million individuals) currently receiving VA care has DM.<sup>2</sup>*

Excess body weight, especially visceral fat, can drive increasing insulin resistance and the cardiometabolic sequela which are outlined in detail in the two clinical practice guidelines (CPGs). As little as 5% weight loss can improve these cardiometabolic markers and prevent progression to type 2 diabetes .

It is generally accepted that type 2 diabetes is a progressive disease. It is expected that more medications will have to be added over time as treatment fails to reach desired HbA1c goals, eventually in many cases requiring treatment with insulin injections from 1 to 4 times a day. Treatment with insulin is cumbersome and even dangerous, given the increased chances of

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<sup>1</sup> <https://www.healthquality.va.gov/guidelines/cd/obesity/>

<sup>2</sup> <https://www.healthquality.va.gov/guidelines/cd/diabetes/>

hypoglycemia. Insulin increases hunger and leads to weight gain and can increase rates of cardiovascular disease, dementia, obesity, cancer, and death.

For Obesity programs such as MOVE and others have shown limited effectiveness and high drop out rates. The foundation of MOVE as well as the Obesity CGP focus on the energy balance model and not the model of hormonal dysregulation defined in the Carbohydrate Insulin Model.<sup>3</sup>

We need to have simple communication and tools used in a standard primary care visit to educate the veteran on how to reverse medically significant obesity and diabetes. We hope to close this gap with a simple nutritional intervention directed by the primary care physician. The goal is to empower the veteran with knowledge and a simple action plan that is enjoyable and sustainable.

Recent clinical work and research by myself and others show that obesity and diabetes need not be progressive conditions and can actually be reversed. Type 2 diabetes, by definition, is an intolerance to carbohydrates. Once carbohydrates are removed in large part from the diet, patients can regain sensitivity to their own endogenous insulin and, in many cases, stop injecting insulin and other medications. As the insulin is titrated down, patients experience weight loss, increased satiety, improvement in quality of life, and in many cases, major financial benefits.

However, behavioral changes are difficult. The challenge is bringing education to patients and keeping them motivated to make the right food choices. We believe that regardless of social status, level of education, or financial ability; with the proper intervention, anyone can reverse their obesity and diabetes and greatly improve their health.

### **What is the best method according to the VA/DOD Management of Type 2 Diabetes Mellitus CPG?**

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<sup>3</sup> Ludwig, D.S., Apovian, C.M., Aronne, L.J. et al. Competing paradigms of obesity pathogenesis: energy balance versus carbohydrate-insulin models. *Eur J Clin Nutr* 76, 1209–1221 (2022). <https://doi.org/10.1038/s41430-022-01179-2>

The thorough and detailed 2023 Diabetes CPG outlines the risk of intensive diabetes management with medications and makes the case that the best method to reverse the root cause insulin resistance is nutritional intervention and carbohydrate reduction. Yet they comment that it's difficult to adhere to. This is where we must step in as clinicians and educators and assist these veterans. This QI project is simply gathering data on a practice trying to achieve the standard of care or best known method.

From the CPG p50-51:

*....patients randomized to a nutrition intervention strategy that limited total daily carbohydrate intake to <20% of energy without energy restriction and approximately 60% energy from fat without restricting the type of dietary fat compared with those randomized to a diet with 50–60% nutrients from carbohydrate, 20–30% fat and 20–30% protein had clinically significant ( $p < 0.001$ ) improvements in HbA1c at 3 months and 6 months. Patients randomized to the low carbohydrate diet also experienced statistically significant weight loss as compared with those randomized to the traditional diet without caloric restriction. Surrogate CV risk markers, including LDL and HDL, demonstrated improvement in HDL values for patients randomized to the low carbohydrate nutrition intervention. HOMA-IR, a reflection of the degree of insulin resistance, measurements showed statistically significant improvements for patients randomized to the low-carb diet intervention at 6 months.*

*....Evidence from studies lasting 12 weeks to 6 months, using an RDN to individually calculate participant energy requirements, monitoring energy intake using structured nutrient analysis software and altering macronutrient distribution from less than 20% of daily energy requirements from carbohydrates to 60% of daily energy requirements from carbohydrates, demonstrated that patients randomized to the lower percentage of dietary carbohydrates experienced the most significant improvement in HbA1c and fasting plasma glucose. Studies assessing the ability to implement and sustain a low carbohydrate nutrition intervention strategy found that patients randomized to a low carbohydrate diet (defined as 10–25% energy from carbohydrates) rarely achieved an intake of <20% energy from carbohydrates.*

**The intervention:**

During a routine primary care visit and the multiple completing administrative and patient needs that must occur we also educate the veteran with insulin resistance and show them the markers in their labs, vital signs, weight, and waist which confirm the diagnosis. We then discuss a simple plan of how to reverse it and give them hope that they can restore the energy and vitality which they no longer feel. We empower them to reverse chronic medical conditions and restore their warrior health.

The two spreadsheets attached with personal identifiers removed show the total number of veterans who have met criteria for obesity, metabolic syndrome, pre diabetes, or diabetes since starting here the end of March. It is nearly half of the population even in this younger cohort of veterans. The veterans come in for a routine primary care visit , so the counseling and intervention is done within the context of a regular visit with compromising other competing demands.

My hypothesis is that empowering the veteran with knowledge and simple assessment the clinician can direct the veteran to make scientifically based nutritional and behavior change which will greatly affect their overall health and outcomes in the future. The veterans I see have very busy lives and lots of competing demands in their lives. To scale this up we should rely on multiple visits from multiple health practitioners and frequent education sessions, many of which can give the veteran conflicting opinions leaving them even more distressed and confused. In my clinic like many other primary care clinics there is also no capacity to see patients more often than every three to six months at best.

**Outcomes we hope to achieve over a 6- 12 month followup:**

We aim to address 3 important aspects of metabolic disease

- BMI with corresponding waist reduction signifying visceral fat loss
- A1C reduction
- Medication reduction esp medications contributing to escalating insulin resistance and insulin load as well as blood pressure medications.

- Additionally we are following Blood Pressure and lipids over time

We aim to address obesity with featured of metabolic syndrome. We will measure BMI with corresponding waist reduction signifying visceral fat loss. We will also collect data on BP, lipids, and A1C to assess for metabolic improvements.

## Objectives

### 1. Weight loss:

Evaluate percent of patients that achieved 5%;

Evaluate percent of patients that achieved 10%

### 2. Insulin and Hypoglycemic agent use:

Evaluate percent of patients that were able to stop insulin ;

Evaluate percent of patients who reduced dose by more than 50%

Reduction of other glucose lowering medications

### 3. A1c reduction:

Evaluate percent of patients that achieved HbA1c less than 6.5%;

Evaluate percent of patients that reduced HbA1c by more than 1%

Our preliminary data is very encouraging showing over half of the veterans in a very short follow-up time have already met 5% weight loss. Diabetes is also greatly improving with several of the veterans off or greatly reducing insulin therapy thus placing their diabetes into remission. Importantly we are doing this without obesity medications and in fact we are reducing medications in almost all patients to restore their normal hormonal milieu and metabolism. We will know more as we get out 6 and 12 months but my hypothesis is this is a sustainable, simple, clear, and understandable way of eating which is incredibly nutrient dense.

My involvement with this QI project is an evolution of the last 10 years of my clinical and research work in the space of obesity and diabetes as a primary care physician. In addition to board certification in family medicine I am board certified in obesity medicine. I am also a certified metabolic health practitioner through the Society of Metabolic Health Practitioners. Here are some of the patient guides and publications which I have assisted with over the years with the goal of working on a standard of care for the common conditions of obesity and type 2 diabetes where the goal should be reversal.

Thank you for allowing me to submit this QI Project

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**Towards a Standard of Care -Links to Articles on Low Carb guidelines I've helped with**

**Published Papers and Guidelines:**

**Look in or book in: The case for type 2 diabetes remission to prevent diabetic retinopathy**

<https://insulinresistance.org/index.php/jir/article/view/79/248>

**JMIR Diabetes - An Innovative, Paradigm-Shifting Lifestyle Intervention to Reduce Glucose Excursions With the Use of Continuous Glucose Monitoring to Educate, Motivate, and Activate Adults With Newly Diagnosed Type 2 Diabetes: Pilot Feasibility Study**

<https://diabetes.jmir.org/2022/1/e34465>

**Adapting Medication for Type 2 Diabetes to a Low Carbohydrate Diet- Frontiers 2021**

<https://pubmed.ncbi.nlm.nih.gov/34434951/>

<https://www.frontiersin.org/articles/10.3389/fnut.2021.688540/full>

**-Guideline Central: Low-Carbohydrate Nutrition Approaches in Patients with Obesity, Prediabetes and Type 2 Diabetes**

<http://eguideline.guidelinecentral.com/i/1180534-low-carb-nutritional-approaches-guidelines-a-dvisory/0?>

UK version

- <http://eguideline.guidelinecentral.com/i/1183584-low-carb-nutrition-queens-units/0?>

**-Adapting diabetes medication for low carbohydrate management of type 2 diabetes: a practical guide**

<https://bjgp.org/content/69/684/360>

**-A clinician's guide to inpatient low carbohydrate diets for remission of type 2 diabetes : toward a standard of care protocol**

<https://www.openaccessjournals.com/articles/a-clinicians-guide-to-inpatient-lowcarbohydrate-diets-for-remission-of-type-2-diabetes-toward-a-standard-of-care-protocol-12898.html>

**-A low-carbohydrate survey: Evidence for sustainable metabolic syndrome reversal**

<https://insulinresistance.org/index.php/jir/article/view/30/88>

**-Clinical Guidelines For the Prescription of Carbohydrate Restriction as a Therapeutic Intervention/Society of Metabolic Health Practitioners**

<https://thesmhp.org/clinical-guidelines/>

**Is It Time for a Lockdown on Sugar? CJSM 2020**

[https://journals.lww.com/cjsportsmed/Citation/9000/Is\\_It\\_Is\\_Time\\_for\\_a\\_Lockdown\\_on\\_Sugar\\_.98906.aspx](https://journals.lww.com/cjsportsmed/Citation/9000/Is_It_Is_Time_for_a_Lockdown_on_Sugar_.98906.aspx)

**Patient Resources:**

**“Low Carb on any Budget - A Low-carb Shopping and Recipe Starter Begin a Life Free of Dieting and Indulge Yourself in Health”**

Pdf version

[www.tinyurl.com/LCanybudget](http://www.tinyurl.com/LCanybudget)

**Low Carb for Law Enforcement**

[www.tinyurl.com/lowcarbLE](http://www.tinyurl.com/lowcarbLE)