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Research Article

Using GH-Method: Math-Physics Medicine to Control Type-2 Diabetes

Hsu GC*
Department of Medicine, eclaireMD Foundation, USA

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***Corresponding author:**
Gerald C Hsu, Department of Medicine, 7 Oak Haven Way Woodside, CA 94062, Eclaire MD Foundation, USA, Tel: +1-510-331-5000, Email: g.hsu@eclairemd.com

1. Abstract

The author developed his GH-Method: Math-Physical Medicine (MPM) by applying mathematics, physics, engineering modeling, and computer science (big data analytics and AI) to derive the mathematical metabolism model and three prediction tools for weight, FPG, and PPG with >30 input elements. This study includes 11 categories: weight, glucose, blood pressure, lipids, food, water, exercise, sleep, stress, life pattern regularity, time with ~500 input and output elements. He collected more than 1 million "clean" data over 7 years.

2. Keywords: Type 2 diabetes; Cardiovascular risk; Obesity; Metabolism; Metabolic conditions; Chronic diseases; Lifestyle data; Artificial intelligence; Math-physical medicine

3. Introduction

The author spent 8.5 years and 23,000 hours to research his diabetes conditions. He developed his GH-Method: Math-Physical Medicine (MPM) by applying mathematics, physics, engineering modeling, and computer science (big data analytics and AI). He believes in "prediction" and has developed five models, including metabolism index, weight, Fasting Plasma Glucose (FPG), Postprandial Plasma Glucose (PPG), and hemoglobin A1C. All prediction models have reached to 95% to 99% accuracy. His focus is on preventive medicine, especially on diabetes control via lifestyle management.

The author has had Type-2 Diabetes (T2D), hyperlipidemia, and hypertension for 25 years. His health data in 2010 versus 2018 are listed as follows:

Weight: 205/170 lbs.

Waistline: 44/33 in.

FPG/PPG: 185/380 vs. 107/119 mg/dL

90-days daily glucose: 279/117 mg/dL

A1C: 10.0%/6.5 %

ACR: 116/12 mg/mmol

Triglycerides: 1161/67 mg/dL

LDL/HDL: 174/28 vs. 74/48

SBP/DBP: 250/113 vs. 105/65 mmHG

Table 1: Health Exam Data from 2010-2017

Health Exam Data		
Year	2010	2017
A1C	10.0	6.1
90-days avg glucose	279	113
ACR	116.4	12.3
Triglyceride (<150)	1161	67
HDL (>40)	24	48
LDL (<130)	174	74
Total cholesterol (<200)	253	118
Weight	210 lbs	170 lbs
Waistline	44 inches	34 inches
Medication	3 kinds	None

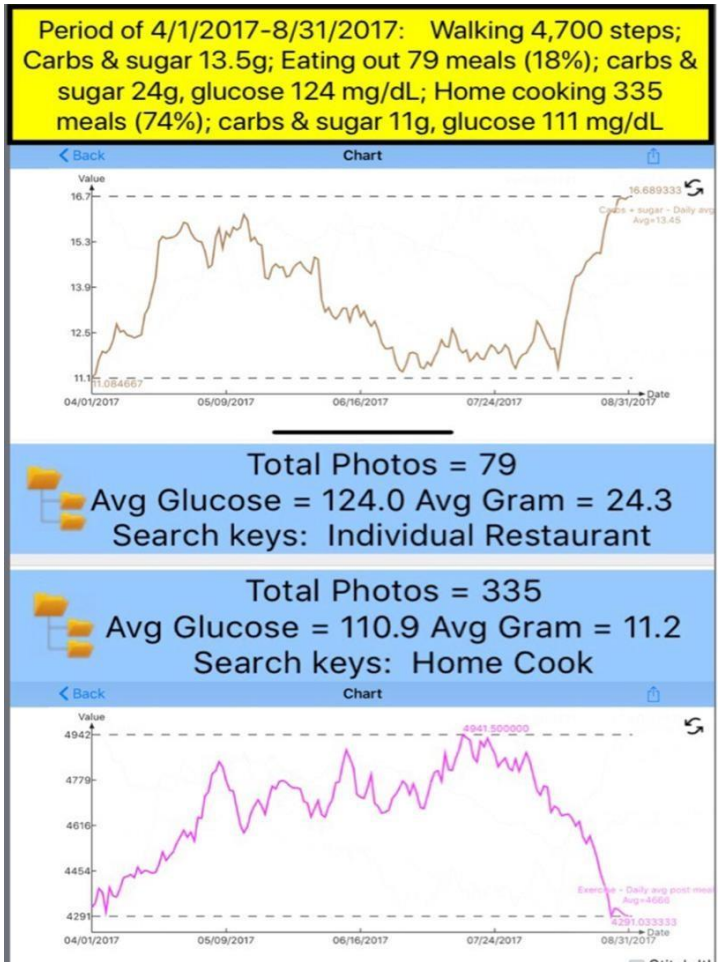

Figure 1: Average Glucose from 4/1/17 – 8/31/17

4. Method

He applied multiple nature scientific disciplines, including advanced mathematics, big data analytics, artificial intelligence, cloud mobile computing [1], nonlinear engineering modeling, optical physics, signal processing, wave theory, and energy theory to conduct his research for 23,000 hours in 8.5-years. He simulated the human organic metabolic system using 10 categories including four outputs [2] (weight, glucose, blood pressure, lipid), and six inputs (food, exercise, stress, sleep, water, life pattern regularity) with ~500 elements. He defined two new terms, Metabolism Index (MI) and General Health State Unit (GHSU) for measuring his daily health status [3]. He collected ~1.5 million data and developed four prediction models

with more than 20 influential factors, Weight, FPG, PPG, A1C, to provide early estimation and warning [4].

He performed statistical analyses, including time-series, spatial analysis, frequency domain, for durations between 1,280 and 1,825 days with about 30,000 - 90,000 data to identify basic characteristics of glucose formation and prediction. Primary factors, such as medication, weight, carbs & sugar, exercise, and weather contribute about 90% of glucose formation. Secondary factors, such as measurement of time, stress, sleep, illness, and traveling provide the remaining 10% of the glucose formation.

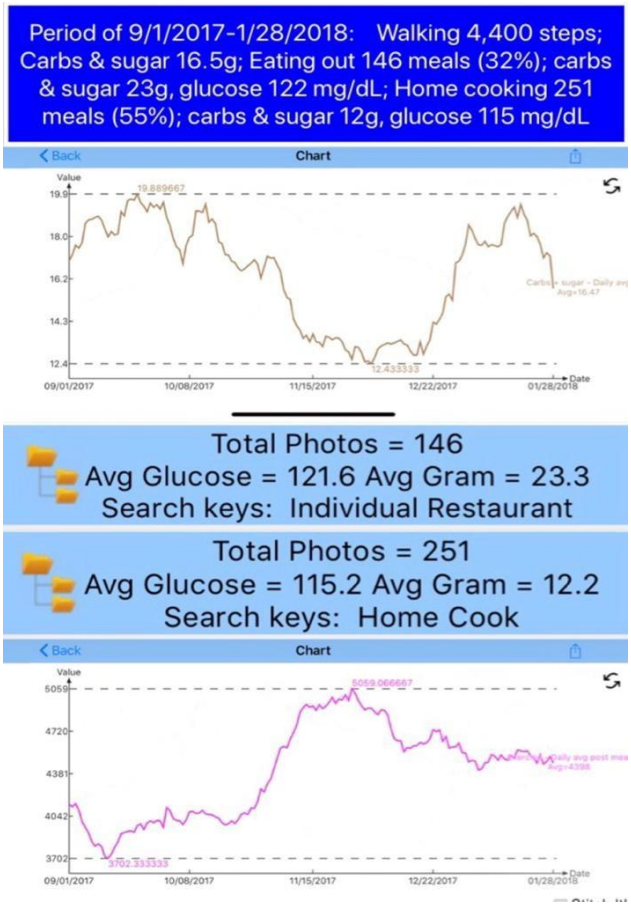

Figure 2: Average Glucose from 9/1/17 – 1/28/18

5. Results

The predicted results for weight, FPG, and PPG have reached >99% linear accuracy and >80% correlation with actual data. The predicted A1C has >95% accuracy rate due to the 5% to 10% safety margin.

6. Conclusion

The author applied GH-Method: math-physical medicine, which is a scientific and quantitative lifestyle management method, to successfully control his T2D conditions.

References:

1. Gerald CH. Using Math-Physical Medicine to Control T2D via Metabolism Monitoring and Glucose Predictions. Journal of Endocrinology and Diabetes. 2018; 1: 1-6.

2. Gerald CH. Using Signal Processing Techniques to Predict PPG for T2D. International Journal of Diabetes & Metabolic Disorders. 2018; 3: 1-3.

3. Gerald CH. Using Math-Physical Medicine and Artificial Intelligence Technology to Manage Lifestyle and Control Metabolic Conditions of T2D. International Journal of Diabetes & Its Complications. 2018; 2: 1-7.

4. Gerald CH. Using Math-Physical Medicine to Study the Risk Probability of having a Heart Attack or Stroke Based on Three Approaches, Medical Conditions, Lifestyle Management Details, and Metabolic Index. EC Cardiology. 2018; 5: 1-9.