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From a Public Health Point of View to Investigate the Control of Obesity, Diabetes, and Cardiovascular Risk Via Nutrition and Exercise (GH-Method: Math-Physical Medicine)

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Introduction

In 2017, public health data revealed that the United States had 2 million deaths which included diabetes, heart diseases, stroke, and nephrosis that occupied 45% (~907,000) of this number. Furthermore, >85% of type 2 diabetes (T2D) patients are overweight and >50% are obese.

Methods

The author spent 23,000 hours during the past 8.5 years using math-physical medicine to conduct his research. He has collected and processed ~1.5 million data, including ~300,000 medical conditions, and ~1.2 million lifestyle details. He then utilized the GH-Method: math-physical medicine (MPM) which involves advanced mathematics, optical physics, signal processing, energy and wave theories, statistics, big data analytics, machine learning, artificial intelligence to develop five prediction models, including weight, FPG, PPG, adjusted glucose, and HbA1C.

Results

His clinical case studies have offered the following results:

1. BMI reduction from 32 (obese) to 24.7 (normal).
2. FPG reduction from ~200 mg/dL to ~105 mg/dL; PPG from 279 mg/dL to 119 mg/dL; Daily average glucose from >250 mg/dL to ~116 mg/dL; HbA1C from 10% to <6.5%.
3. Risk reduction of having cardiovascular diseases and stroke from 74% prior to 2010 (suffered 5 cardiac episodes) to 26.4% in 2017.
4. Average carbs/sugar intake amounts (38% contribution on PPG): 14.5 gram/meal and ~60 grams/day (low carb diet). Exercise amount (41% contribution on PPG): 4,300 steps/meal and 18,000 steps/day.

Conclusion

The author's MPM methodology and prediction models (>99% accuracy) are proven to be effective tools on controlling T2D. His flow diagram can also provide an effective guidance to patients to control and improve their conditions on obesity, diabetes, and heart problems. These technology-based prediction and prevention models can be used as educational tools to help diabetes patients through public-health platforms, channels and programs.

Health Examination Record	2010	2017	Note
A1C (<6.4%)	10	6.1	
90-days Average Glucose (<120 mg/dL)	279	113	
ACR (<30)	116.4	12.3	
Triglyceride (<150)	1161	67	
HDL (>40)	24	48	
LDL (<130)	174	74	
Total Cholesterol (<200)	253	118	
Blood Pressuire Index M3 (<1.0)	1.2	0.7	
BMI (<25.0)	31.0	24.7	
Weight (lbs)	210	167	
Waistline (inch)	44	32	
Matabolism Index (MI / GHSU: <73.5%)	140% / 103%	49% / 55%	
Heart episodes (1994 - 2006)			5 times
Kidney			Yes
Blader			Yes
Foot Ulcer			Yes

Figure 1: Health Exam Results Comparison.

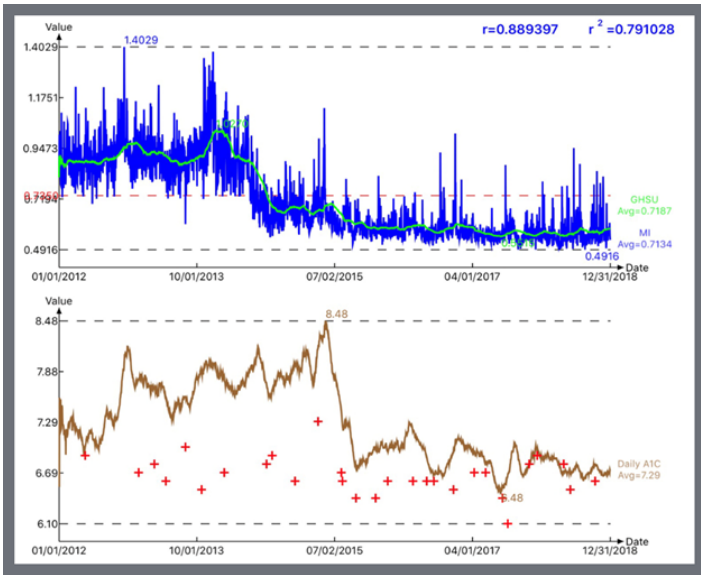

Figure 2: Metabolism Index and HbA1C.

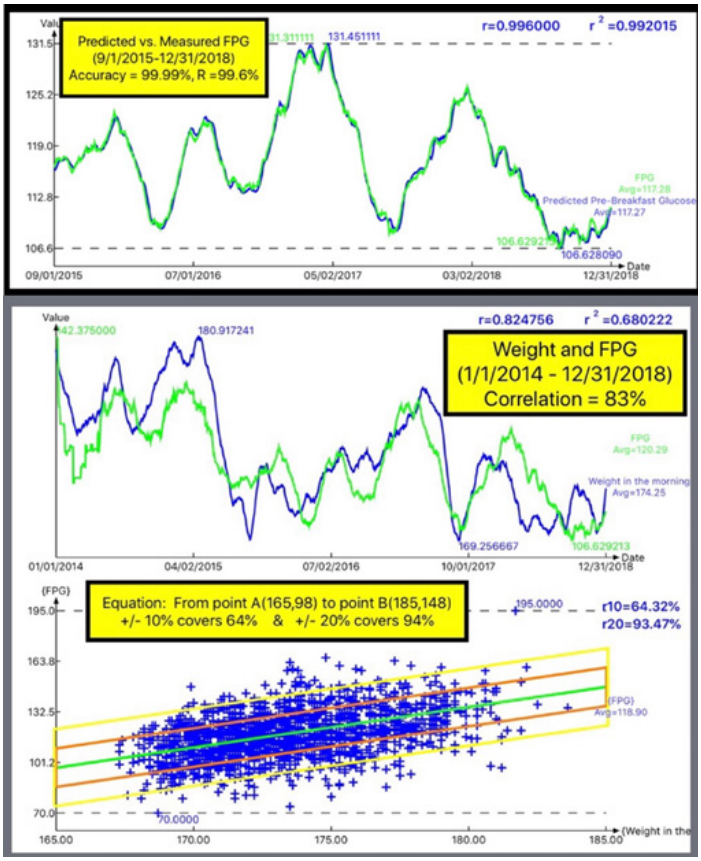

Figure 3: FPG .

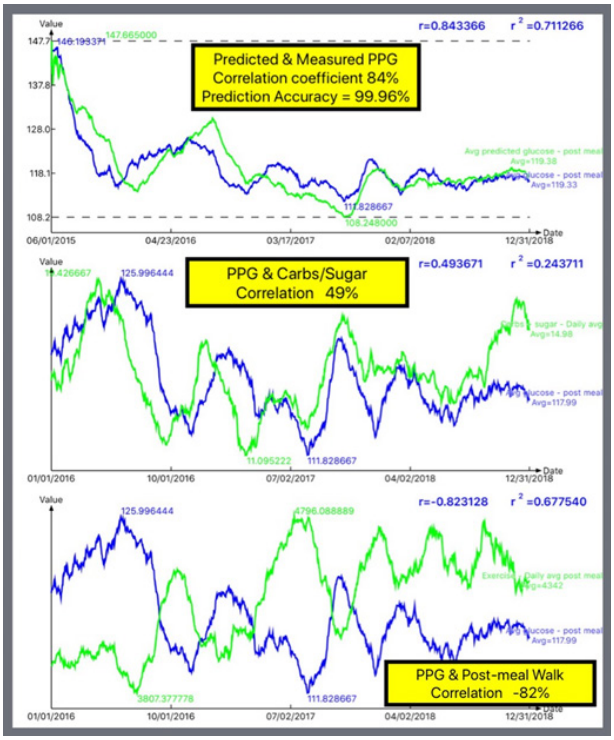

Figure 4: PPG.

Year	Probability MI	Probability Medical	Probability Lifestyle	Year Averaged
2000		74%	83%	79%
2012	74%	62%	70%	69%
2013	77%	38%	66%	60%
2014	59%	42%	54%	51%
2015	43%	39%	44%	42%
2016	36%	31%	38%	35%
2017	34%	26%	33%	31%
2018	33%	31%	33%	32%
7-Years	52%	34%	34%	40%

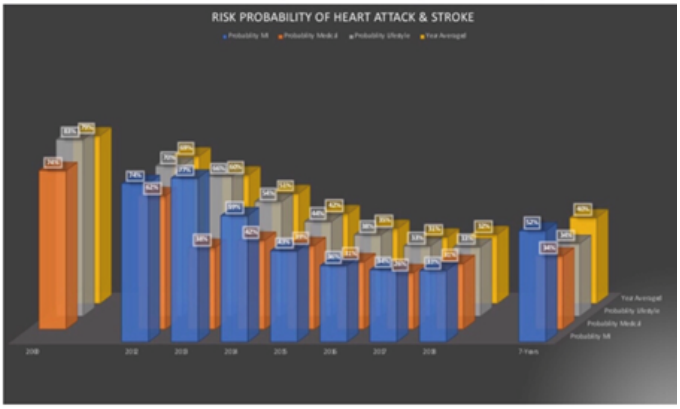

Figure 5: Risk Probability of CVD & Stroke.

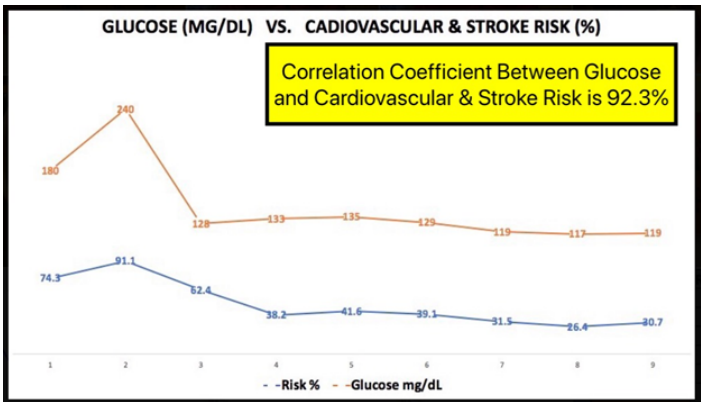

Figure 6: Correlation between Glucose and CVD Risk.

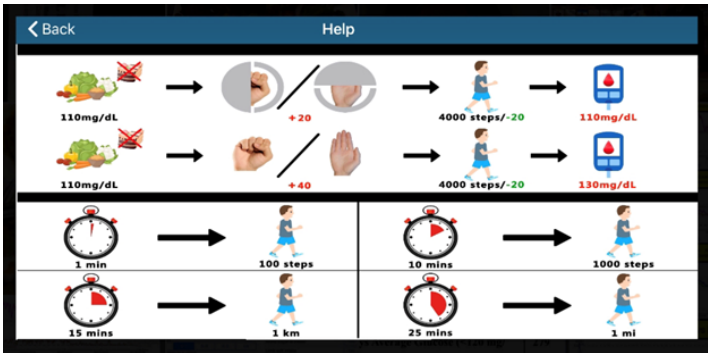

Figure 7: Nursing Guide of T2D Control.

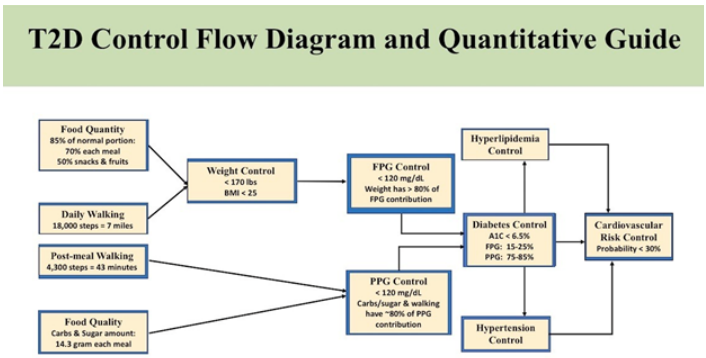

Figure 8: T2D Control Flow Diagram.