

## **How to Reverse Chronic Disease Induced Heart Conditions Using a Simple and Effective “Cookbook of Quantitative Formulas” Using GH-Method: Math-Physical Medicine (No. 256)**

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**Keywords:** chronic disease, cardiovascular disease, stroke, heart disease, glucose

**Abbreviations:** CVD: cardiovascular disease; CAD: coronary artery disease; CHD: coronary heart disease; FPG: fasting plasma glucose; PPG: postprandial plasma glucose; HbA1C: hemoglobin A1C; BMI: body mass index; MI: metabolism index

### **Introduction**

The author uses GH-method: math-physical medicine (MPM) approach to investigate his risk probability (risk) of having cardiovascular disease (CVD) or stroke. Here, the word of CVD implies the most common type of heart disease. It is also called coronary artery disease (CAD), or coronary heart disease (CHD). All these situations relate to plaque buildups to block the blood flow in arteries due to high glucose and high lipid, or rupture of arteries caused by high glucose and high blood pressure. Based on the research findings of his CVD and stroke risks investigation [1], this article specifically addresses how he “reversed” his chronic diseases induced heart conditions in a quantitative manner, *via* a stringent lifestyle management program without drugs or surgeries. The word “reverse” used in this context is to change the direction of his heart condition progression to prevent the condition from worsening.

### **Methods**

#### **Background**

The author is a 73-year-old male who has a history of 3 severe chronic diseases for over 25 years. He experienced 5 cardiac episodes, without having a stroke, from 1994 through 2008. During that period, he thought the cause of his cardiac episodes were outcomes from his stressful business life. In mid-2010, he was diagnosed with an acute renal problem with an albumin-to-creatinine ratio (ACR) level of 116 mg/g (30–300 mg/g refers to albumin excretion above the normal range) and would eventually, require dialysis treatment. At that time, he also consulted with three independent physicians and received similar warnings that he would die within 3–5 years if he did not reverse his overall poor health conditions. This kidney episode was his final “wake-up call”. Therefore, he launched his own efforts of study and research internal medicine, especially endocrinology. Since 2010, he spent 30,000 h to focus on research of diabetes and its various complications, especially heart and kidney. Now, he has extended his research into diabetic retinopathy and hyperthyroidism.

During 2010–2013, he self-studied diabetes and food nutrition *via* reading many textbooks and medical publications. In 2012, he developed customized computer software to collect vital data on his health conditions. By 2014, he further developed a complex mathematical model of metabolism and started his stringent lifestyle management program. As a result, his overall health conditions have been noticeably improving since 2014. In the same year, he decided to gradually reduce the dosage of his three different diabetes medications. By December 8th of 2015, he completely stopped taking all kinds of diabetes medications. Within 2015–2016, he also created 4 mathematical prediction models for body weight, fasting plasma glucose (FPG), postprandial plasma glucose (PPG), and hemoglobin A1C (HbA1C) values, and achieved accuracy rates above 97%. Due to his high-tech background, he also applied optical physics and artificial intelligence to develop an iPhone app to estimate the carbs/sugar amount contained inside of his food from meal photos, and then predicted his finger-piercing PPG level at 2 h after the first bite of his meal. During the entire post-medication period of 12/8/2015 through 5/5/2020, his lab tested HbA1C average value is around 6.6% which decreased from his peak value of 10% in 2010.

## Glucose

Arteries in our body carry glucose (nutrition) and oxygen *via* blood flow to our heart and other organs which then provide energy (*i.e.*, metabolism) for living our life. This situation is remarkably similar to the tubes that transmit gasoline and air to the engine and other parts of the car which provide energy to move the car.

In his various research subjects of diabetes and complications, including heart (CVD, CAD, CHD), stroke, kidney, bladder, nervous system, foot, eyes, and thyroid, he has identified high glucose (diabetes) as the “principal criminal” while high blood pressure (hypertension) and high lipid (hyperlipidemia) are “accessory criminals” that work together to cause various diabetes complications. Glucose contributes somewhere near 40–60% weight of the total influences.

There are many contributing factors to high glucose despite two biological factors which are pancreatic beta cells damage and being overweight (obesity). In total, there are 24 influential factors, such as food, exercise, weather temperature, sleep, stress, etc. Among those many influential factors, the most prominent two are carbs/sugar intake (39%) and post-meal exercise (41%). Exercise not only reduces inflammation in our body organs but also highly effective to bring down our glucose level quickly. The “post-meal” exercise impacts PPG even more obviously. Although some human psychological behaviors, including love to eat and lazy on exercise, are quite common for most people, diet control is indeed far more complicated than exercising in terms of scope of knowledge, variety of choices, and degree of difficulty.

Once diet and exercise are in place, most likely, glucose and HbA1C will be under well control. Now, let us expand the glucose control to combine with the management of both blood pressure (reduce salt consumption, avoid stress, exercise) and lipid (avoid fat, reduce cholesterol consumption, exercise), your blood system (both artery and micro-vessels) will then be in a healthy state. This will reduce our risks of having artery problems, such as CVD & stroke; and micro-vessel and nerves problems, such as renal failure, bladder infection, foot ulcer, diabetic retinopathy, and erectile dysfunction, and so forth.

## Nutrition

The author has been practicing the following listed rules in terms of his diet nutrition control:

- In general, 90% of his meals are plant-based diets and 10% are animal-based diets. Among all of the popular diets in the consumer market, the Mediterranean Diet is his recommended preference, not Atkins or Paleo.
- He maintains a well-balanced nutrition diet which includes carbohydrates and sugar coming from vegetables mainly. Due to diabetes sensitivity to sugar, he eats only limited quantities and carefully selected fruits, such as berries. Besides, he prefers high-quality proteins from fish, chicken, egg white, cheese, and tofu. He cooks his meals with olive oil mainly, uses flaxseed oil for salad at least 1.4 g per day since it contains high omega

3. He eats small amounts of seeds and nuts every day, frequently eats a reasonable amount of whole grains, legumes, soy products and makes sure that his daily supplies of multiple vitamins are met.

- He avoids eating white rice; white flour-based food, *e.g.*, bread, noodle, or cake; potatoes; vegetable roots; or any refined food with high carbohydrates or sugar in it. Occasionally he eats a small amount of brown rice, oatmeal, or whole-wheat toast.
- He avoids any high-fat animal-based red meat, such as beef, pork, or lamb. He only eats fish and a limited amount of shellfishes. He does not like to eat chicken, but chicken (without skin and fat) is a good protein source.
- He tries to eat “whole food” which is defined as food that is naturally produced from the farm and has not been processed or refined by any machine in any factory and are free from any chemical additives or artificial substances.
- In summary, he mainly eats lots of vegetables, plant-based diet with low sugar, low fat, low refined-carbs, low animal proteins, high plant-based protein, high in good fat (omega-3 fatty acids).

## Results

The above section of methods is mainly described qualitatively; however, this section of results will be described quantitatively. All these results are measured and analyzed from data collected during the period of 12/8/2015 through 5/5/2020, the so-called “post-medications period” (Figure 1).

	Biomedical Variable	Conversion Formula
From:	Food Portion	82%
To:	Weight	173 lbs
From:	Weight	1 lb
To:	FPG	1.5 - 3.6 mg/dL
From:	Carbs/Sugar	1 gram
To:	PPG	+ 1.8 mg/dL
From:	Walking	1,000 steps
To:	PPG	- 5.0 mg/dL
From:	Temperature	- 1 degree F
To:	FPG	- 0.3 mg/dL
From:	Temperature	+ 1 degree F
To:	PPG	+ 0.9 mg/dL
From:	FPG & PPG	25% FPG + 75% PPG
To:	HbA1C	/ 17.1931

Figure 1: Table of Conversion formulas.

### Weight control

He maintains 82% of his normal food portion as guidelines of his regular meal amount. In this way, he could maintain his body mass index (BMI) around 25 and his weight would fluctuate between 170–176 lbs. (77.2–80 kg) with an average weight of 173 lbs. (78.6 kg). As a reference, he weighed 220 lbs. (100 kg) in 2000 and weighed 198 lbs. (90 kg) in 2010 (Figure 2).

### FPG control

FPG would drop between 1.5 mg/dL and 3.6 mg/dL for each pound of weight reduction. The daily FPG variance range also depends on some other factors, such as sleep condition, stress, cold weather temperature, etc. During this period of research data, the variance range of his FPG is bouncing between 93 mg/dL and 140 mg/dL with an average FPG of 116 mg/dL (Figure 2).

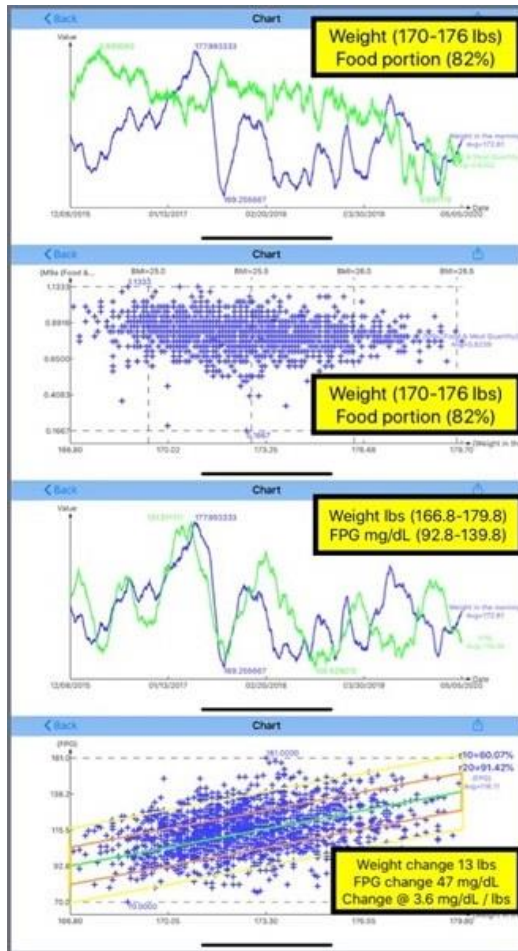


Figure 2: Weight and FPG.

### PPG control

PPG would increase by 1.8 mg/dL for each gram of carb/sugar intake. During this period, his average carbs/sugar intake was 14.48 g and his average PPG increased by 26.1 mg/dL.

PPG would decrease by 5.0 mg/dL for each 1,000 steps of post-meal walking. During this period, his average post-meal walking was 4,285 steps and his average PPG decreased by 21.4 mg/dL (Figure 3).

FPG would decrease by 0.3 mg/dL for every degree Fahrenheit weather temperature decrease, while PPG would increase by 0.9 mg/dL for every degree Fahrenheit weather temperature increase. During this period, the weather temperatures vary between 58°–87° with an average temperature of 72.4°. Most of the time, he moved around according to the change of weather, except for trips to attend various medical conferences. As a result, his PPG increased amount from weather temperature influence is +3.4 mg/dL.

The author utilized signal processing technique to decompose 7 waveforms of secondary influential factors and then combined with waves of both carbs/sugar and post-meal walking to obtain a predicted finger PPG at 117.6 mg/dL (Figure 4) [2]. This gives a prediction accuracy of 99.2% in comparison with the actual measured finger PPG at 116.7 mg/dL.

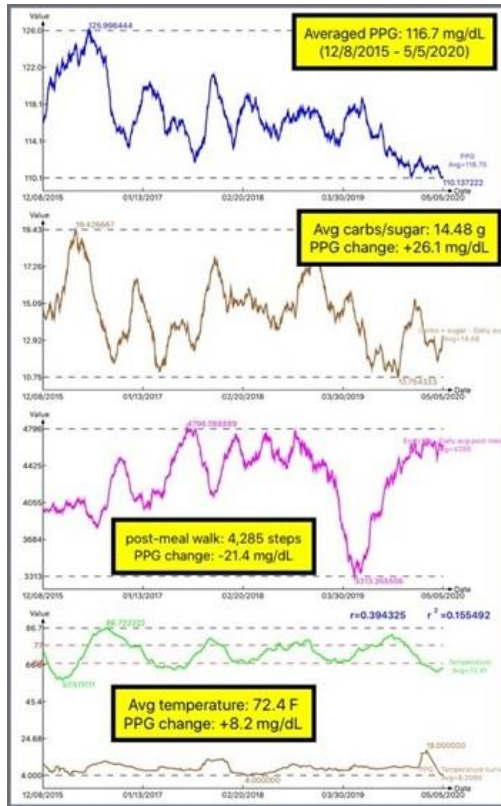


Figure 3: PPG and carbs/sugar, post-meal walking and temperature.

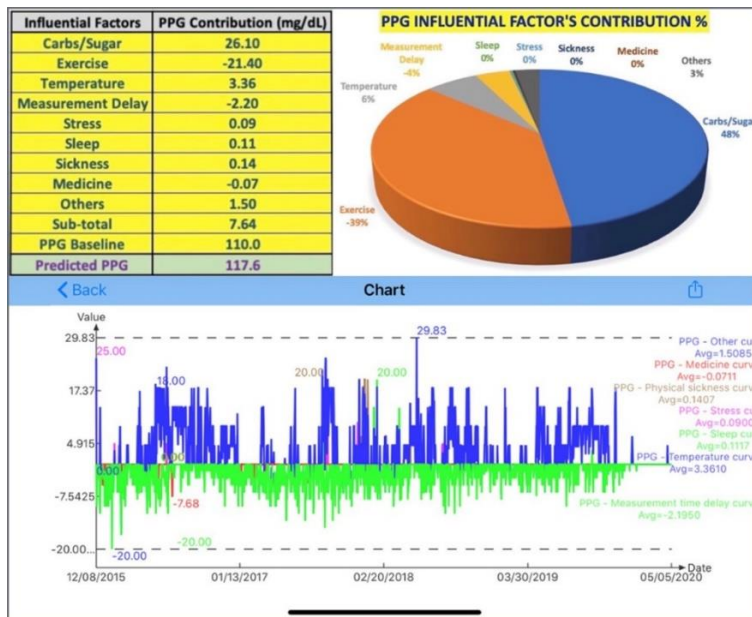


Figure 4: Secondary influential factors of predicted PPG via signal processing.

### HbA1C control

FPG occupies ~25% of the influential weight on HbA1C formation while PPG occupies ~75% of the influential weight on HbA1C formation. During this period, his average FPG was 116.4 mg/dL while his average PPG was 116.7 mg/dL.

They are amazingly close to each other. This is not a coincidence, but rather due to his diligence and persistence in implementing his lifestyle management program. As a result, his mathematically predicted daily HbA1C value was 6.8% (97% prediction accuracy) while his 23 collected lab-tested HbA1C average value was 6.6% (Figure 5).

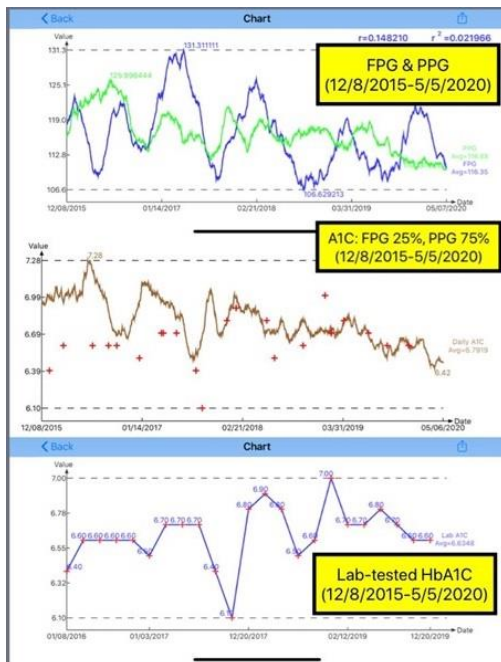


Figure 5: FPG, PPG and HbA1C.

### Blood pressure, lipid

His average SBP/DBP/heart rate was 109/66/56. His average triglycerides/LDL/HDL was 108/109/47. All these values are normal and healthy (Figure 6).

### Metabolism index

His average metabolism index (MI) was 0.58 which is extremely healthy (below the break-even line of 0.735) [1]. By implementing and following his stringent lifestyle management program, he could completely control his type 2 diabetes conditions. As an associated consequence, his hypertension (high blood pressure) and hyperlipidemia (high lipid) conditions were also well under-controlled since those three areas are inter-related (Figure 6) [3].

### CVD risk assessment

In 2017, he developed a sophisticated and complex mathematical model to calculate his risk probability of having a chronic disease induced CVD or stroke. This model includes personal & genetic data, such as age, gender, race, family medical history, personal health history, BMI (weight and height), waistline, bad habits (smoking, alcohol drinking, illicit drugs), probability of blockage and rupture of blood vessels due to different medical conditions (mainly chronic diseases), and lifestyle details. Here are his annualized risks probability based on MI of having a CVD or stroke (Figure 7):

Y2000: 85% (weight - 220 lbs., BMI - 32.5, waistline - 44 in)

Y2010: 82% (weight - 198 lbs., BMI - 29.2, glucose - 280 mg/dL)

Y2012: 82% (glucose - 128 mg/dL)

Y2013: 84% (glucose - 133 mg/dL)

Y2014: 71% (developed metabolism model, glucose - 135 mg/dL)

Y2015: 60% (weight and FPG control, glucose - 129 mg/dL)

Y2016: 55% (PPG control and stopped medication, glucose - 119 mg/dL)

Y2017: 54% (BMI - 25, glucose - 117 mg/dL)

Y2018: 53% (heavy traveling, glucose - 116 mg/dL)

Y2019: 55% (heavy traveling, glucose - 114mg/dL)

Y2020: 51% (weight - 171 lbs., BMI - 25, waistline - 32.5 in, glucose - 112 mg/dL)

It should be noted here that the risk probability percentages are expressed on a “relative” scale, not on an “absolute” scale.

Due to his heavy traveling schedules of attending more than 60 medical conferences during 2018–2019, his risks of having a CVD or stroke were in the range of 53–55%; however, this recent stabilized self-quarantined life in 2020 (since 1/19/2020) has helped him to bring his risk down to 51%.

It is obvious that his chronic diseases induced CVD risks and annually average glucose have an extremely high correlation of 83% (Figure 8). As he mentioned earlier, through his research results of the past 5-years, he has already detected that glucose is the “principal criminal” plus the help from both blood pressure and lipids as the “accessory criminals” in terms of chronic diseases induced CVD. Not only his overall health conditions have been greatly improved which can be seen from his regular medical examination reports, but also his “reversed” heart conditions can also be observed from his past medical examination reports.

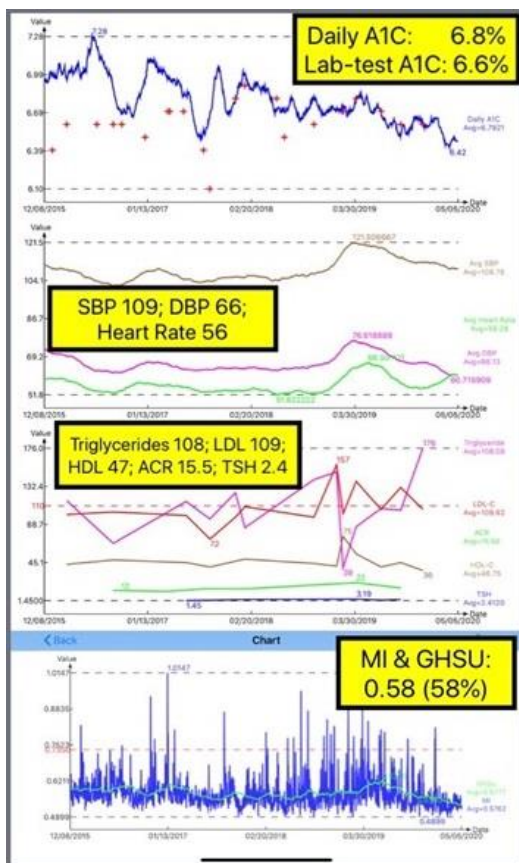


Figure 6: HbA1C, BP, lipid, and MI.

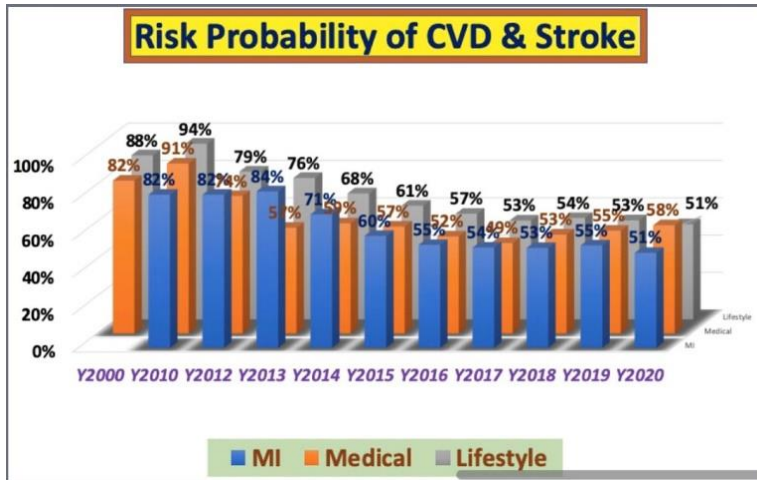


Figure 7: CVD risk (2010–2020).

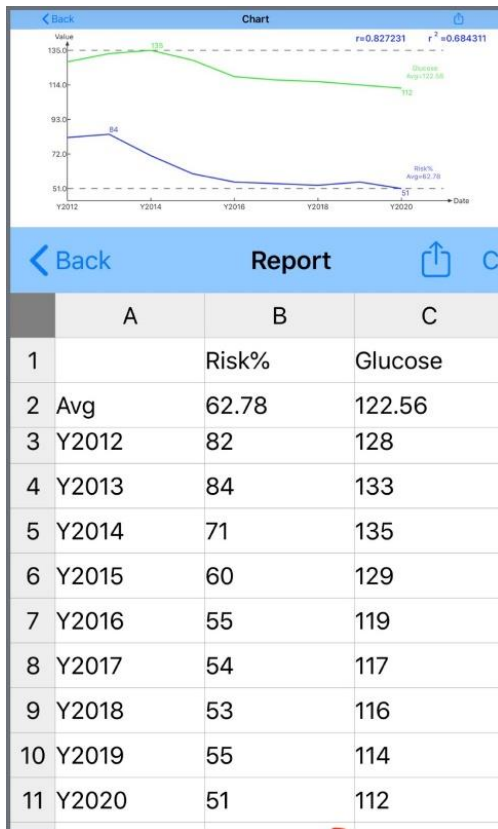


Figure 8: CVD risks and glucoses.

### Conclusion

Lifestyle change and its continuous management provides better results than medications and/or surgeries. Stents and angioplasties are indeed limited in their functionality. Of course, medications and surgeries can also save patient’s lives; however, they can coexist with a lifestyle management program. It should be further noted that about 5% of the total patients account for up to 80% of the total healthcare costs with heart disease as being number one.

This article describes the author's cookbook of reversing his CVD conditions *via* lifestyle management. His CVD risk probability research results for the past 10-years and his lifestyle management-related "cookbook of qualitative guidelines and quantitative formulas" from his past 4.5 years of work have provided a detailed explanation of his proven ways to reverse his heart conditions. Human organs are amazing. They have their own memories and strengths to repair themselves if properly taken care of.

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