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BIOGRAPHY

Gerald C Hsu received an honorable PhD in Mathematics and majored in Engineering at MIT. He attended different universities over 17 years and studied seven academic disciplines. He has spent 20,000 hours in T2D research. First, he studied six metabolic diseases and food nutrition during 2010-2013, then conducted research during 2014-2018. His approach is "math-physics and quantitative medicine" based on mathematics, physics, engineering modelling, signal processing, computer science, big data analytics, statistics, machine learning and AI. His main focus is on preventive medicine using prediction tools. He believes that the better the prediction, the more control you have.

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FROM PUBLIC HEALTH POINT OF VIEW TO INVESTIGATE THE CONTROL OF OBESITY, DIABETES, AND CARDIOVASCULAR RISK VIA NUTRITION AND EXERCISE

Introduction: Public health data shows that, in 2017, USA had two million deaths which diabetes, heart diseases, stroke and nephrosis occupied 45% (~907,000). Furthermore, >85% of T2D patients are overweight and >50% are obese.

Methods: The author spent 20,000 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 advanced mathematics, optical physics, signal processing, energy and wave theories, statistics, big data analytics, machine learning and 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: BMI reduction from 32 (obese), to 24.7 (normal); FPG reduction from ~200 mg/dL to ~105 mg/dL; PPG from 279 mg/dL to 119 mg/dL; Daily averaged glucose from >250 mg/dL to ~116 mg/dL; HbA1C from 10% to <6.5%; Risk reduction of having cardiovascular diseases and stroke from 70-90% prior to 2010 (suffered 5 heart attacks) to 26.4% in 2017; Averaged carbs/sugar intake amounts (38% contribution on PPG) are 14.5 gram/meal and

~60 grams/day (low carb diet). Exercise amounts (41% contribution on PPG) are 4,300 steps/meal and 18,000 steps/day.

Conclusion: His 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 could be used as educational tools to diabetes patients through public-health channels and programs.

Note: