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# Applying first-order perturbation theory of quantum mechanics to predict and build a postprandial plasma glucose waveform (GH-Method: math-physical medicine)

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## Abstract

The author presents his techniques of applying first-order perturbation theory of quantum mechanics to predict and build a postprandial plasma glucose (PPG) waveform based on the "perturbation factor" of carbs/sugar intake amount. This is a part of his GH-Method: math-physical medicine research methodology. Initially, he applied segmentation pattern analysis to analyze his 1,825 meals with 23,725 PPG Sensor data collected during a period of 2018-2019. His two segments are based on both "first factor" of meal's carbs/sugar intake amounts and "second factor" of post-meal walking steps. His low-carb meals occupy about 2/3 of the total meals (1,209 meals with 8.5 grams per meal) and high-carb meals occupy about 1/3 of the total meals (615 meals with 27.1 grams per meal). His post-meal walking steps are comparable (4,238 vs. 4,282 steps). A standard waveform (curves) contains 13 data points for each PPG curve and one input data for each 15-minute time segment. Glucose variance is an extremely complex biochemical and biophysical phenomenon. After a diabetes patient collects and establishes an initial waveform with an accurate input dataset, we can then predict the glucose behavior and then draw a new approximate PPG waveform according to one prominent perturbation factor, such as carbs/sugar intake or post-meal exercise. Therefore, a patient will have the ability to predict his PPG behavior before consuming his meal or initiates his post-meal exercise

## 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 ~30,000 hours in endocrinology research with an emphasis in diabetes. First, he studied six metabolic diseases and food nutrition from 2010 to 2013, then conducted his own diabetes research from 2014 to 2019. His approach is "quantitative and precision medicine" based on mathematics, physics, optical and electronics physics, engineering modeling, wave theory, energy theory, signal processing, computer science, big data analytics, statistics, machine learning, and artificial intelligence. His main focus is on preventive medicine using prediction tools. He believes that the better the prediction, the more control you have. Thus far, he has written, published and presented more than 200 medical papers.

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