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## Differences between fasting plasma glucose and postprandial plasma glucose

**Introduction:** This paper describes the quantitative and qualitative differences between fasting plasma glucose (FPG) and postprandial glucose (PPG).

**Methodology:** The author has been researching type 2 diabetes (T2D) for the past eight years. Here are the three stages: (1) collected 8,878 glucose data (7,206 PPG and 1,672 FPG) for five years; (2) studied and analyzed glucose to determine their influential factors with contributing ratios and (3) developed predicted glucose models and then calculated the predicted hemoglobin A1C value (HbA1C). Not only is glucose a medical indicator, but it also involves lifestyle factors. Some healthcare professionals do not have a comprehensive understanding of this simple term- glucose.

**Results:** Table 1 shows glucose differences, analysis methods, and conclusions by using a big data analytics (~1.5 million). Most people define glucose as blood sugar level and nothing more; however, FPG and PPG are quite different because their influential factors and contribution percentages are diverse. In addition, their behaviors are different in terms of changing speed, normal peak, sensitivity, etc. The prediction methodologies are also not the same. The author believes in preventive medicine, including prediction of glucose, and controlling T2D via lifestyle management. The better you can predict their behavior, the better chance you can reduce their damage. He spent three years to develop five prediction models to achieve approximately 99% of linear accuracy with high correlations (pattern similarity) between two biomedical signal waves, predicted and measured glucose.

**Conclusions:** Currently, the patient's T2D is completely under control by using author's developed methodology and five artificial intelligence based prediction tools. A deep understanding and quantitative sense of FPG and PPG will benefit the task of effectively controlling diabetes.

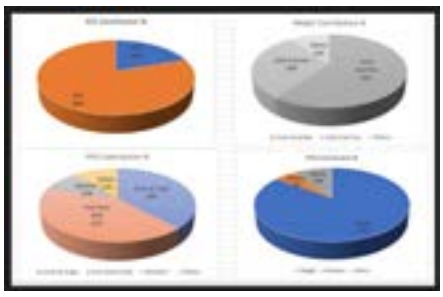

**Figure1:** Comparison between FPG and PPG.

**Figure 2:** Prediction models' results.

**Figure 3:** Contribution % of Weight, FPG, PPG and A1C.

## Recent Publications

1. Hsu Gerald C (2018) Using signal processing techniques to predict PPG for T2D. International Journal of Diabetes & Metabolic Disorders. 3(2):1-3.
2. Hsu, Gerald C. (2018, June). Using Math-Physical Medicine to Analyze Metabolism and Improve Health Conditions. Video presented at the meeting of the 3rd International Conference on Endocrinology and Metabolic Syndrome 2018, Amsterdam, Netherlands.
3. Hsu, Gerald C. (2018). Using Signal Processing Techniques to Predict PPG for T2D. International Journal of Diabetes & Metabolic Disorders, 3(2),1-3. Retrieved from https://www.opastonline.com/wp-content/uploads/2018/06/using-signal-processing-techniques-to-predict-ppg-for-t2d-ijdmd-18.pdf
4. Hsu, Gerald C. (2018). Using Math-Physical Medicine and Artificial Intelligence Technology to Manage Lifestyle and Control Metabolic Conditions of T2D. International Journal of Diabetes & Its Complications, 2(3),1-7. Retrieved from http://cmepub.com/pdfs/using-mathphysical-medicine-and-artificial-intelligence-technology-to-manage-lifestyle-and-control-metabolic-conditions-of-t2d-412.pdf

## 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 modeling, 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. The author has not received any financial assistance from any organization.

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**Notes:**