

The GH-Method

Community Medicine, Doctors Without Distance: Using AI Tools and Internet to Assist T2D Patients in Remote Rural Areas Based on GH-Method: Math-Physical Medicine Approach (No. 226)

Gerald C. Hsu*

eclaireMD Foundation, USA

Keywords: Artificial intelligence; Diabetes; Body weight; Glucose

Abbreviations: AI: artificial intelligence; T2D: type 2 diabetes; FPG: fasting plasma glucose; PPG: postprandial plasma glucose

1. INTRODUCTION

In this paper, the author introduces a groundbreaking approach that harnesses modern computer technology and artificial intelligence (AI) to realize the concept of "Doctors-without-Distance." This approach aims to extend clinical and community healthcare services to patients with Type 2 Diabetes (T2D), particularly those residing in remote or underdeveloped rural areas.

2. METHODS and RESULTS

The author has developed four prediction models based on his extensive 9-year research in endocrinology and metabolism:

1. Body weight
2. Fasting plasma glucose (FPG)
3. Postprandial plasma glucose (PPG)
4. Hemoglobin A1C (A1C)

To implement these models, he has created an AI Glucometer (AIG) software designed for use on smartphones or PCs. This AI software utilizes a wide range of scientific principles, including optical physics, wave theory, energy theory, perturbation theory, big data analytics, structural mechanics, fluid mechanics, and finite element engineering modeling. The author has gathered and stored a vast dataset of approximately 8 million food nutrition

entries in a cloud server, serving as the central repository for sophisticated glucose analysis and complex biomarker calculations that consider diet, exercise, and other influencing factors.

The process involves training a local representative, ideally a nurse or dietitian, to impart essential lifestyle management knowledge and instruct T2D patients in using this AI tool.

As depicted in Figure 1, after receiving training from an on-site medical professional, the patient gains the ability to utilize this AI tool. They begin by inputting their morning weight, and the AI tool provides a predicted FPG value. Throughout the day, patients capture images of their meals (breakfast, lunch, or dinner) and save them on their smartphone or PC. They also select the number of post-meal walking steps, ranging from 10,000 to 50,000 steps or in minutes. The AI tool calculates the predicted PPG value based on these inputs, and a mathematically simulated daily HbA1C value is displayed on the device. Figure 2 illustrates an example of predicted and measured Weight, FPG, PPG, and HbA1C (displayed as 90-day moving average curves) for a T2D patient.

Additionally, the AI tool offers a feature to assist overweight or obese patients in

controlling their food portions, as shown in Figure 1.

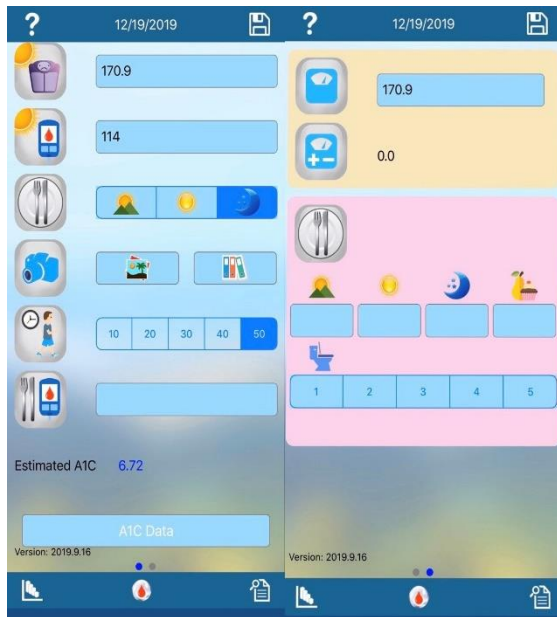


Figure 1: Artificial intelligence glucometer (AIG).

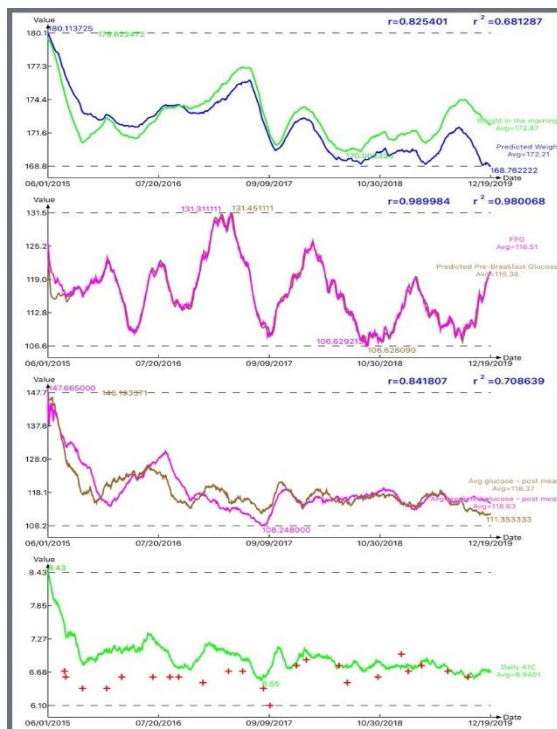


Figure 2: Examples of predicted and measured body weight, FPG, PPG, HbA1C.

A medical doctor remotely examines the biomedical data and monitors the patient's diabetes control status and progress via the internet or computer network. The local healthcare representative plays a crucial role in collecting information, transferring knowledge, addressing inquiries, and providing emotional support.

This infrastructure, combined with AI tool usage, allows centralized medical doctors to efficiently care for more patients than they would typically handle in a traditional clinic setting.

3. CONCLUSION

The author envisions that the "doctors-without-distance" concept, empowered by modern computer technology and advanced AI tools, can substantially enhance the support, service efficiency, and coverage for diabetes patients living in remote areas.