

## Review Article

# Conquering Diabetes Through Lifestyle Changes: A Role Model's Inspiring Journey

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**Received:** 23 Dec 2024

**Accepted :** 29 Dec 2024

**Published:** 21 Jan 2025

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## Introduction

The primary objective for individuals with diabetes is to attain a long and healthy life free from complications related to diabetes. Achieving this goal requires continuous monitoring and control of blood sugar, lipids and blood pressure, which are of paramount importance. Besides these factors, lifestyle modification plays a crucial role and must be the cornerstone of any management plan for type 2 diabetes.

While genetic factors are often implicated in the development of Type 2 Diabetes, improper lifestyle remains one of the most significant contributors. The close relationship between overweight/obesity and the risk of developing type 2 diabetes is now well established [1].

Excessive visceral adipose tissue is an independent risk factor for the development of type 2 diabetes even after controlling for total body fatness [2]. More recently, other ectopic fat depots such as liver fat and pancreatic fat have also been shown to be closely related to type 2 diabetes [3].

Although certain new medications show promise, a universally effective, safe, easily accessible and financially affordable medication has not yet been found. When a medication is potent and affordable, such as sulphonylurea and insulin, it carries inherent risks of side effects, such as hypoglycemia and additional weight gain. The discovery of new safe and effective medications, such as GLP-1RAs and SGLT2 inhibitors, has led to a shift in these medicines becoming the first choice for managing cardiovascular risk in Type 2 Diabetes [4]. Unfortunately, the majority of individuals worldwide with Type 2 Diabetes cannot access or afford these new drugs.

In fact, the most effective and the cheapest way to manage type 2 Diabetes is the lifestyle modifications. These include:

1. Avoiding excessive calorie consumption
2. Increasing physical activity levels

Thus, the fundamental principle for the effective management of Type 2 Diabetes is to "Eat less and Move more."

The American Diabetes Association has clearly outlined in the "Standard of Care in Diabetes-2023" that one of the essentials for achieving diabetes treatment goals is the facilitation of positive health behaviors and well-being. This encompasses Diabetes Self-Management Education and Support (DSMES), medical nutrition therapy (MNT), regular physical activity,

tobacco cessation counseling when necessary, health behavior counseling, and psychosocial care [5]. There are numerous examples and pieces of evidence like Da Qing IGD and Diabetes study, Diabetes Prevention Program studies and Finish Diabetes Prevention Study indicating that lifestyle modifications can effectively mitigate Type 2 diabetes mellitus [6-10]. Moreover there have been studies examining the reversibility of Type 2 diabetes when individuals lose weight through active lifestyle changes, featuring a low-calorie, low carbohydrates diet and physical exercise, as in studies including Look AHEAD trial [11,12]. The intensive lifestyle changes even lead to regression of coronary atherosclerosis after 5 years [13]. However, it's essential to recognize that if one reacquires the weight they had previously lost, diabetes may resurface. Therefore, a complete cure for diabetes is unlikely, making long-term sustainability through lifestyle changes crucial.

Although the lifestyle modification is a standard component of treatment, these recommendations are frequently not fully implemented [14,15]. According to a new study just providing the advice of "eat less move more" in the primary care clinic doesn't actually work for weight loss [16]. Currently the lifestyle coaching or health coaching has been introduced to improve healthy lifestyle behaviors and personal health coaching intervention has also showed higher rates of satisfaction for both patient and clinician [17]. Actually, implementing these changes is often easier said than done. In practice, lifestyle modification is one of the most challenging treatments to adhere to, given human nature's inclination toward comfort and luxury.

Changing health behaviors and firmly established habits is actually not easy for patients with Type 2 Diabetes [18,19]. Of course there are still many barriers in diabetes self-management [20-24].

The patients with T2D remain responsible for implementing these recommendations, and simply advising them to be more physically active is not enough to increase their level of physical activity [25]. Since many obese individuals with diabetes are asymptomatic and may not experience immediate discomfort, making it difficult to alter their lifestyle. Some individuals may opt to embrace their obesity, believing that being fat indicates a state of good health, which can make it challenging to change their lifestyle.

First and foremost, it is critical to understand the complications associated with Obesity and Diabetes. Secondly, once the significance of these

complications is effectively communicated, individuals need to become vigilant about their health. It's important to understand that the actions taking for someone's health today, even when he or she feels well, serve as an investment in achieving a better quality of life in the next 10 to 20 years. Adopting this perspective is the key to preventing complications and sustaining these habits over time. To instill lifestyle modifications, it's crucial to possess a strong commitment to adhere to these changes [26]. The most important thing is to have a powerful will to maintain and continue a habit called 'Adherence'. Nevertheless, adopting this mindset can be challenging, and even healthcare professionals may find it difficult to incorporate these healthy habits into their own daily lives, despite being fully aware of the associated benefits. This underscores the fact that knowledge alone is insufficient to ensure adherence to the necessary lifestyle changes. Many people concentrate solely on avoiding certain foods and taking anti-diabetic medications, while the most crucial medication of all, 'lifestyle modification,' is often overlooked.

During lifestyle counseling, one effective strategy might be the sharing the story of someone who has successfully transformed their life to achieve remission from diabetes, serving as a role model. The main objective of this article is to emphasize the significance of lifestyle modifications for both individuals without diabetes and those living with the condition. It is hoped that this article will serve as a guide, encouraging a shift in mindset towards prioritizing knowledge, attitude, and practice.

### **The one whose life is saved by lifestyle modification**

It is about sharing the remarkable story of an individual who no longer relies on anti-diabetic medications and has also overcome complications such as kidney damage and cardiac episodes and now leading a remarkably healthy life. Thanks to his strong will and wise decision to change his lifestyle. This individual is Mr. Gerald C. Hsu, the founder of the EclairMD foundation and a renowned international keynote speaker. I had the privilege of attending his speech when he was invited by MSEM (Myanmar Society of Endocrinology and Metabolism) to speak at the Melia Hotel in Yangon on January 26, 2019. After hearing his speeches and witnessing his lifestyle, I believe it would be beneficial to describe his journey to inspire and educate people with diabetes. He has been kind enough to grant permission and has also contributed as a co-author of this article.

### **Inspiring story about Gerald Hsu**

Gerald C. Hsu is a 71-year-old Chinese American who has resided in the USA for over 50 years and has battled diabetes over 20 years. Gerald is widely recognized as a highly successful IT technician and high-tech entrepreneur. His father is a professional doctor from China. Gerald moved to America at a young age (20 years old), and he has always demonstrated his genius by pursuing his interests through extensive research rather than simply accumulating university degrees. His academic journey took him through seven different colleges over 17 years, where he studied a diverse array of disciplines, including applied mathematics, computer science, mechanical engineering, structural engineering, ocean engineering, soil mechanics, biomechanics, finance, and marketing. This demonstrates his academic prowess.

Furthermore, he is now one of the most successful entrepreneurs in America. For 40 years, he worked in the following seven major industries: aerospace & defense, naval ships, nuclear power, earthquake engineering, computer hardware, computer software, and semiconductors and most of his industrial experiences were related to computer science and artificial intelligence.

He is also an inventor. He has invented many gadgets like portable computer, smart printer, 3D CAD, software robotics, etc. He founded the world most advancing semiconductor design AI tool company between 1999 and 2002, and he became the highest paid CEO in Silicon Valley.

Because of all of his hard work, he becomes a successful millionaire. There is no doubt that Gerald is not only a genius but also a rich and successful businessman.

### **About Gerald health**

Gerald has been living with Diabetes since 1997. Surprisingly, the wealth he accumulated over this time didn't support him to his well-being; instead, it worsened his glycemic control along with the cardiovascular and renal complications. He openly acknowledged that an unhealthy lifestyle was the culprit behind his health decline.

According to his speeches, he sought consultation from the top doctors in California, took what were considered the most potent medications, and even had meals prepared by the best chefs with guidance of nutritionists. However, between 1994 and 2006, he experienced severe coronary heart disease five times. Luckily, he survived, thanks to the best doctors and their treatments. He initially attributed his heart attacks to work-related stress, leading him to continue his unhealthy lifestyle. In 2010, he started to suffer from kidney disease apart from his heart disease. At that time, his HbA1c level was more than 10%. His BMI was 31, body weight was 210 lbs, and his waist circumference was 44 inches. His blood cholesterol level was also high despite regular consumption of cholesterol lowering agents. Therefore, his doctors started to advise him to take serious action for controlling his blood sugar level. Since oral medications were not able to control his blood sugar any longer, taking insulin injection was recommended for Gerald. Then, he realized he had reached a turning point in his life when he was warned by three different doctors that if his HbA1c levels remained high, he would need to undergo hemo dialysis within three years.

It was a wake-up call for him when he was warned again that he would only survive for three more years if kidney disease developed on top of his existing heart disease. However, he was unable to accept the fact that he needed insulin injections and that his kidneys were at risk of being damaged.

Finally, he decided to take action to survive and left behind the life that had been consumed by his successful businesses. He bought a house in a remote and quiet area of Las Vegas and cut ties with everyone connected to his businesses.

He began to reflect on his life, questioning what had gone wrong over the years, how to correct those mistakes, and why he had achieved poor results despite strictly following the doctors' instructions. In August 2010, he started learning six types of chronic diseases related to diabetes in internal medicine field. He read many books about obesity, diabetes, hypercholesterolemia, hypertension, stroke, coronary heart diseases and nutrition as well as thousands of researches about them.

With his expertise in IT, he collected a vast dataset comprising over 9 million food-related records. What's particularly intriguing are his discoveries regarding how different types of food impact blood sugar levels and their effects on blood sugar fluctuations both before and one to two hours after eating. According to his findings, those people with chronic diabetes with high blood sugar level can get their blood sugar back to normal if they can walk between 3000 to 4000 steps within half an hour from the time they start eating. For those with early diabetes with less hyperglycemia can get this result with 1000 to 2000 steps. Moreover, he observed that walking after a meal is more effective than walking in the early morning in type 2 diabetes like him. In essence, walking helps burn calories, presenting a practical solution to address calorie surplus.

Gerald has conducted a research using himself as a subject to find out the time when blood sugar levels were at their lowest during sleep, the correlation between sleep patterns and blood sugar levels, the impact of

weather changes on blood sugar, and fluctuations in blood sugar levels during travel.

Gerald took several finger pricks every day to record his blood sugar level throughout the day and he studied all the data using his knowledge in statistic and IT. Subsequently, he tailored his physical activities and dietary choices accordingly. Building on this extensive self- experimentation, Gerald developed AI tools based on his mastery of mathematics, physics, engineering, and computer science. AI acts like a human brain to predict and calculate the desirable blood sugar results, HbA1c level and body weight. Since AI can predict post- meal blood sugar levels without the need for finger pricks, it will be possible to reduce the portion size or to change to food with lower glycemic index. This prediction will be very useful for people with diabetes [27,28,29].

Over time, Gerald's health improved significantly due to his lifestyle modifications, leading to a reduction in his reliance on anti-diabetic medications. By December 2015, after five years of diligent effort, he had completely eliminated the need for anti- diabetic, antihypertensive, and cholesterol-lowering agents. His body had returned to a drug- free state, a state completely devoid of medication. After 2016, he was appraised by his doctor due to his recovery and all the good investigation results. The comparison of his Basic Biomarker Data between 2010 and 2017 were as follows:

Weight: 210 lbs vs. 172 / 171 lbs, Waistline: 44 inches vs. 34 / 33 inches, PPG (Post-meal Glucose): 350 mg/dL vs. 116 / 117 mg/dL, FPG (Fasting Glucose): 185 mg/dL vs. 119 / 114 mg/dL, estimated Daily Glucose: 280 mg/dL vs. 117 / 116 mg/dL, Hb A1C: 10.0% vs. 6.5% / 6.7%, Daily Estimated A1C: 10.0% vs. 6.84% / 6.78%, ACR (Albumin-to-Creatinine Ratio): 116 mg/dL vs. 12 / 12 mg/dL, Triglycerides: 1161 mg/dL vs. 69 / 113 mg/dL. Surprisingly, it is astonishing to know that all of his results were got without any medications. However, it is still needed to maintain the lifestyle modification to keep this condition. In reality, his body is not free from Diabetes. It is just being under controlled through proper lifestyle changes up until now, in 2024.

A valuable lesson has been learned: wealth not only contributes to the development of diabetes but can also worsen its progression. Health is priceless and cannot be bought. That is why even a millionaire like Gerald should change his lifestyle: eat less, make healthier food choices and move more. Strong willpower and adherence, as demonstrated by Gerald, are key to successfully managing diabetes. Healthcare providers must recognize that health education should be regarded as an essential form of “medicine“ for people living with diabetes.

In conclusion, as the author, I extend my wishes to all individuals living with diabetes, their caregivers, and healthcare professionals to draw valuable experiences and lessons from this article. I also wish Gerald a life filled with health, prosperity, and happiness from now on.

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**Cite this article:** Than Than Aye, Gerald C Hsu. (2025) Conquering Diabetes Through Lifestyle Changes: A Role Model's Inspiring Journey. *Japan Journal of Medical Science* 6 (1): 213-216.

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