



Temporary use of a continuous glucose monitoring system as an adjunct to lifestyle medicine education: a feasibility study

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Introduction

- CDC estimates that 45% of U.S. citizens have either diabetes or prediabetes (PD); combined medical cost and lost productivity in United States was \$327 billion, with the majority spent on diabetic complications.^{1,2}
- A continuous glucose monitoring system (CGMs) is clinically useful in patients with type 2 diabetes (T2DM) and PD and is strongly linked with increased adherence to lifestyle changes.^{3,4}
- If the temporary use of a CGMs as an adjunct to therapeutic lifestyle change education is beneficial, this may preempt and mitigate medical costs and loss of productivity, adding another valuable tool for primary care providers.

Evidence

- Intensive glucose control in T2DM has also been shown to lower the risk of cardiovascular events, have a protective effect on the development of end-stage kidney disease, and have a reduction in risk for lower extremity amputation.^{5,6}
- Numerous studies have demonstrated the benefits of lifestyle medicine (LM) modalities on both T2DM and PD; focusing on modifiable risk factors for diabetes utilizing a predominantly plant-based diet, physical activity, control of unhealthy substances, stress management, healthy sleep and meaningful relationships.⁵⁻⁹
- In poorly controlled T2DM, the initiation of CGM for 3 months was useful in improving diet and exercise, reducing BMI, HbA1c, caloric intake and postprandial glucose levels.⁴

Objective

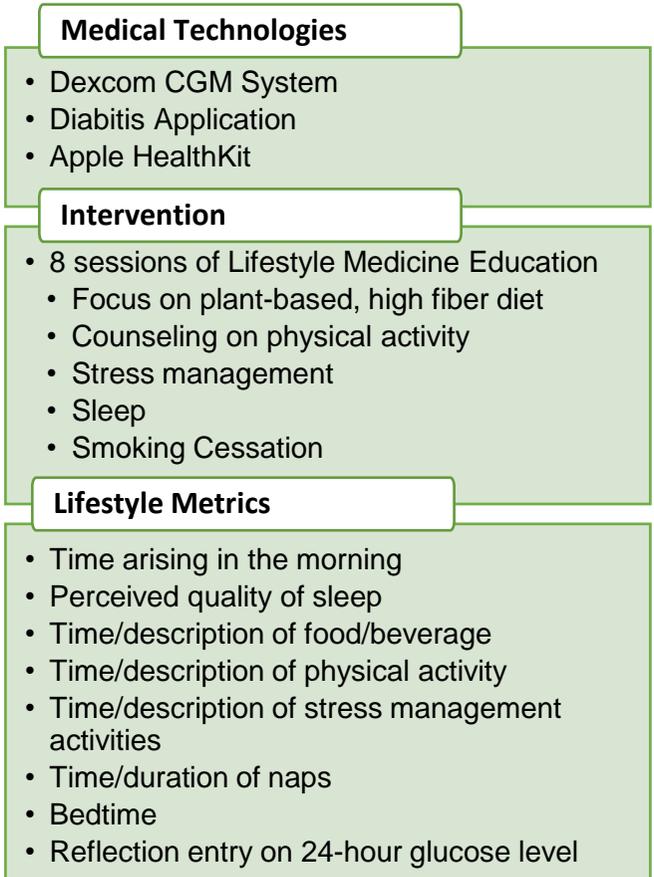
- The purpose of this study is:
 - To evaluate the potential of a temporary CGMs during participation in an intensive therapeutic lifestyle medicine program (ITLMP).
 - To improve compliance with healthy lifestyle change for people with T2DM and PD.
 - Identifying logistical and technical barriers and perceived usefulness of CGMs for the patient.

Outcome Measures

- Identify logistical and technical barriers and perceived benefits to participants

Methods

Table 1: Outline of Methodology



- During an outpatient ITLMP in a medium-sized hospital system in Appalachia Ohio, 15 consenting participants with T2DM or PD will temporarily wear a CGMs continuously for 10 weeks, complete food and exercise logs and enter daily reflections on the visible effects of food consumed and exercise on their blood sugar level.
- After completion of the study participants will complete a survey about their perceptions of the benefits of utilizing CGM.

Anticipated Results/Conclusion

- This study will identify barriers for temporary use of a CGMs in the setting of an ITLMP and perceived benefits to subjects.
- Determine if a CGMs temporarily used in the setting of an ITLMP is feasible, leading to a larger controlled study to evaluate benefits and potential cost savings.

References

- Centers for Disease Control and Prevention. National Diabetes Statistics Report, 2020. Atlanta, GA: Centers for Disease Control and Prevention, U.S. Dept of Health and Human Services; 2020.
- Association AD. Economic Costs of Diabetes in the U.S. in 2017. *Diabetes Care*. Published online March 21, 2018. doi:10.2337/dci18-0007
- Rodbard D. Continuous Glucose Monitoring: A Review of Recent Studies Demonstrating Improved Glycemic Outcomes. *Diabetes Technol Ther*. 2017;19(Suppl 3):S-25-S-37. doi:10.1089/dia.2017.0035
- Allen N, Whittemore R, Melkus S. A continuous glucose monitoring and problem-solving intervention to change physical activity behavior in women with type 2 diabetes: a pilot study. *Diabetes Technol Ther*. 2011;13(11):1091-1099. doi:10.1089/dia.2011.0088
- Bhatt AA, Choudhari PK, Mahajan RR, et al. Effect of a low-calorie diet on restoration of normoglycemia in obese subjects with type 2 diabetes. *Indian Journal of Endocrinology and Metabolism*. 2017;21(5):776. doi:10.4103/ijem.IJEM_206_17
- Tuomilehto J, Lindström J, Eriksson JG, et al. Prevention of Type 2 Diabetes Mellitus by Changes in Lifestyle among Subjects with Impaired Glucose Tolerance. *New England Journal of Medicine*. 2001;344(18):1343-1350. doi:10.1056/NEJM200105033441801
- Scientific Evidence. Accessed February 10, 2019. https://lifestylemedicine.org/ACLM/About/Scientific_Evidence/ACLM/About/What_Is_Lifestyle_Medicine_Scientific_Evidence.aspx?hkey=a7ee2594-c6de-409e-a0dd-086da4b177c1
- Lim EL, Hollingsworth KG, Arbisala BS, Chen MJ, Mathers JC, Taylor R. Reversal of type 2 diabetes: normalisation of beta cell function in association with decreased pancreas and liver triacylglycerol. *Diabetologia*. 2011;54(10):2506-2514. doi:10.1007/s00125-011-2204-7

References

1. Centers for Disease Control and Prevention. National Diabetes Statistics Report, 2020. Atlanta, GA: Centers for Disease Control and Prevention, U.S. Dept of Health and Human Services; 2020.
2. Association AD. Economic Costs of Diabetes in the U.S. in 2017. *Diabetes Care*. Published online March 21, 2018. doi:10.2337/dci18-0007
3. Rodbard D. Continuous Glucose Monitoring: A Review of Recent Studies Demonstrating Improved Glycemic Outcomes. *Diabetes Technol Ther*. 2017;19(Suppl 3):S-25-S-37. doi:10.1089/dia.2017.0035
4. Allen N, Whittemore R, Melkus G. A continuous glucose monitoring and problem-solving intervention to change physical activity behavior in women with type 2 diabetes: a pilot study. *Diabetes Technol Ther*. 2011;13(11):1091-1099. doi:10.1089/dia.2011.0088
5. Bhatt AA, Choudhari PK, Mahajan RR, et al. Effect of a low-calorie diet on restoration of normoglycemia in obese subjects with type 2 diabetes. *Indian Journal of Endocrinology and Metabolism*. 2017;21(5):776. doi:10.4103/ijem.IJEM_206_17
6. Tuomilehto J, Lindström J, Eriksson JG, et al. Prevention of Type 2 Diabetes Mellitus by Changes in Lifestyle among Subjects with Impaired Glucose Tolerance. *New England Journal of Medicine*. 2001;344(18):1343-1350. doi:10.1056/NEJM200105033441801
7. Scientific Evidence. Accessed February 10, 2019. https://lifestylemedicine.org/ACLM/About/Scientific_Evidence/ACLM/About/What_is_Lifestyle_Medicine_/Scientific_Evidence.aspx?hkey=a7ee2594-c6de-409e-a0dd-086da4bff7c1
8. Lim EL, Hollingsworth KG, Aribisala BS, Chen MJ, Mathers JC, Taylor R. Reversal of type 2 diabetes: normalisation of beta cell function in association with decreased pancreas and liver triacylglycerol. *Diabetologia*. 2011;54(10):2506-2514. doi:10.1007/s00125-011-2204-7