# Changes in Glycemic Management after Initiating CGM and DSMES in Men with Type 2 Diabetes

Stote KS, Wilson MM, Cottrell J, Norris T, Rourke JM, Roy MP, Gosmanov AR.
Stratton VA Medical Center, Albany, NY, USA

## ABSTRACT

**Background/Objectives:** Continuous glucose monitoring (CGM) use has grown rapidly. In clinical trials, CGM and diabetes self-management education and support (DSMES) show clinical benefits such as reduction of HbA1c, reduction of hypoglycemia and the increase of the amount of time glucose values are in target range. However, less is known about the efficacy of CGM use in real world clinical settings.

**Research Hypothesis:** CGM along with DSMES improves HbA1c and glucose management metrics for clinical care in persons with type 2 diabetes.

**Methods:** This retrospective observational study examined twelve months of data collected from existing medical records at the Stratton VA Medical Center, Albany, NY. HbA1c and CGM metrics were analyzed in patients with type 2 diabetes who started to use CGM beginning in January 2019 or later. This study was approved by the IRB of the Stratton VA Medical Center.

**Results:** Forty men with type 2 diabetes initiated CGM with DSMES. Mean ± SE HbA1c was significantly lowered at 6 months (8.0 ± 0.3% at baseline compared with 7.6 ± 0.2% at 6 months; *P* = 0.0025) and at 12 months (8.0 ± 0.3% at baseline compared with 7.4 ± 0.2% at 12 months; *P* = 0.0001). Mean ± SE: time in target range (70-180 mg/dl) was 64.9 ± 3.7% and 64.8 ± 3.7%, time above range (> 180 mg/dl) was 29.8 ± 3.9% and 28.6 ± 3.7%, and time below range (< 70 mg/dl) was 4.3 ± 0.8% and 3.5 ± 0.8%, at 6 months and 12 months, respectively.

**Conclusions:** These findings suggest that in men with type 2 diabetes, initiation of CGM under supervision of a DSMES specialist, may improve glycemic management within 6 months following CGM prescription with further improvements up until 12 months of diabetes technology utilization.

## RESEARCH HYPOTHESIS

- CGM along with DSMES improves HbA1c and glucose management metrics for clinical care in persons with type 2 diabetes.

## METHODS

### Study Subjects

Inclusion Criteria:

Random sampling from a population with known diabetes using CGM with a time in range metric at the Stratton VA Medical Center, Albany, NY, USA.

Exclusion Criteria:

A population without diabetes and a population with diabetes without CGM use at Stratton VA Medical Center, Albany, NY, USA.

### Study Design

The study was a retrospective observational study.

- Twelve months of data from the start of CGM were collected from existing patient's medical records.
- HbA1c and CGM metrics were analyzed in patients with type 2 diabetes who started to use CGM with the Freestyle Libre 14 Day System or the Freestyle Libre 2 beginning in January 2019 or later.
- Data was entered in VA Research Electronic Data Capture (REDCap).
- This study was approved by the IRB of the Stratton VA Medical Center, Albany, NY, USA.

### Statistical Analysis

Descriptive statistics were used to present the demographic characteristics of the population and t-tests were used to compare changes in continuous variables. All statistical analyses were performed using StataCorp. 2021. *Stata Statistical Software: Release 17*. College Station, TX: StataCorp LLC. *P*–values < 0.05 were considered statistically significant.

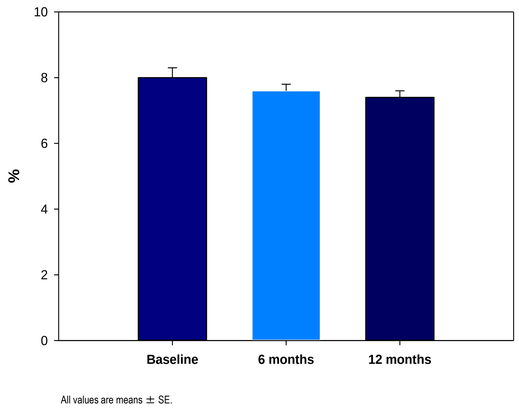
## RESULTS

### Table 1: Subject Characteristics

| Variable | Baseline Values (n = 40) |
|---|---|
| Age (y) | 67.3 ± 0.7 |
| Height (cm) | 175.5 ± 1.1 |
| Weight (kg) | 99.3 ± 3.1 |
| Body mass index (kg/m$^2$) | 32.7 ± 1.0 |
| Race, n (%) | |
| White, alone | 34 (85) |
| Black or African American, alone | 5 (12.5) |
| Native Hawaiian or Other Pacific Islander | 1 (2.5) |
| Co-morbidities, n (%) | |
| Hypertension | 33 (82.5) |
| Dyslipidemia | 33 (82.5) |
| Hemoglobin A1C (%) | 8.0 ± 0.3 |

All values are means ± SE.

### Figure 1: HbA1c

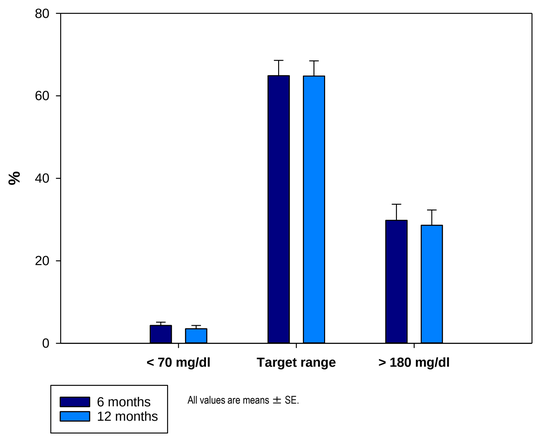



All values are means ± SE.

- HbA1c was significantly lowered at 6 months (8.0 ± 0.3% at baseline compared with 7.6 ± 0.2% at 6 months; *P* = 0.0025).
- HbA1c was significantly lowered at 12 months (8.0 ± 0.3% at baseline compared with 7.4 ± 0.2% at 12 months; *P* = 0.0001).

## RESULTS

### Figure 2: CGM Metrics




All values are means ± SE.

- Time below range (< 70 mg/dl) was 4.3 ± 0.8% at 6 months and 3.5 ± 0.8% at 12 months.
- Time in target range (70 -180 mg/dl) was 64.9 ± 3.7% at 6 months and 64.8 ± 3.7% at 12 months.
- Time above range (> 180 mg/dl) was 29.8 ± 3.9% at 6 months and 28.6 ± 3.7% at 12 months.

## CONCLUSIONS

- These findings suggest that in men with type 2 diabetes, initiation of CGM under supervision of a DSMES specialist may improve glycemic management within 6 months following CGM prescription with further improvements up until 12 months of diabetes technology utilization.

**This study is the result of work supported with resources and the use of facilities at the Stratton VA Medical Center, Albany, NY, USA**