

Background

Self-monitoring of glucose has an integral role in diabetes management. However, patient compliance to glucose self-monitoring is limited. Non-invasive glucose monitoring aim to overcome the barriers of current glucose monitoring methods by offering a simple, painless and convenient mean to measure glucose levels.

Objective

To evaluate the accuracy and precision of GlucoTrack®, a non-invasive glucose monitoring device.

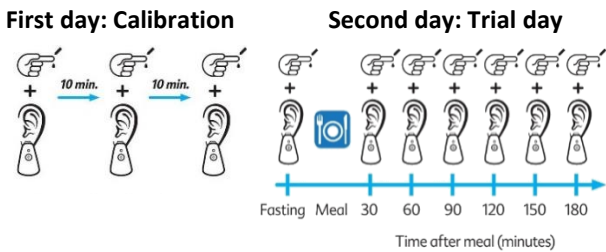


MR-MA-00-0-003
GlucoTrack is a Conformité Européene (CE) certified non-invasive glucose monitoring device for people with type 2 diabetes or prediabetes. The device tracks physiological changes which are correlated with glucose excursions by measuring acoustic impedance, electromagnetic impedance and heat capacity of the earlobe tissue.

Methods

Device accuracy

- 37 people with type 2 diabetes
- Consensus error grid analysis for type 2 diabetes
- Median absolute relative difference (ARD)



Sensor to sensor precision

- 20 people with type 2 diabetes
- ~19 simultaneous measurements using two GlucoTrack devices on each earlobe



- Precision absolute difference (PARD):

$$PARD = \frac{|\text{glucose}_{\text{GlucoTrack1}} - \text{glucose}_{\text{GlucoTrack2}}|}{\text{mean}(\text{glucose}_{\text{GlucoTrack1}}, \text{glucose}_{\text{GlucoTrack2}})} \cdot 100[\%]$$

Methods (cont.)

Test-retest precision

- 20 people with type 2 diabetes
- 86 sequences of ~6 measurements performed with 10-minutes intervals under stable glycemic conditions (~3 hours postprandial)

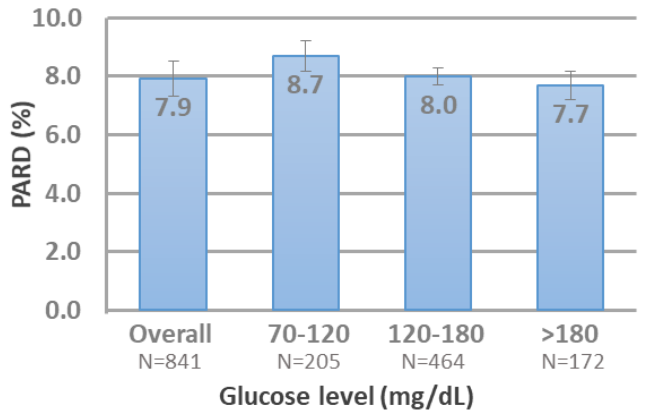


- coefficient of variation (CV):

$$CV = \frac{\sigma}{\mu} * 100\%$$

Results

- **99.6%** of 257 measurements were in zones A and B of the Consensus error grid, with **90.3%** of the measurements in zone A
- Mean and median ARD were **17.2%** and **12.9%**, respectively.
- In various glucose levels, mean PARD ranged from **7.7%-8.7%**



- Mean CV was **7.83±1.03%**

Conclusions

- GlucoTrack is highly accurate
- Sensor-to-sensor precision is comparable to that of CGMs

Device	GlucoTrack®	Dexcom G4™	FreeStyle Navigator™
Overall mean PARD	8.1%	7.3%	9.6%

- GlucoTrack measurements are reliable under stable conditions

