PRECISE II Pivotal Trial of A Long Term Implantable CGM System: 90 Days of Sustained Accuracy and Strong Safety Profile

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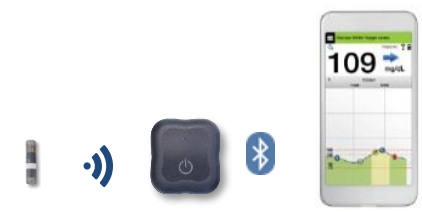
Introduction

The purpose of this study was to determine the efficacy and safety of a new long-term continuous glucose monitoring (CGM) system (Eversense). This system takes glucose readings via a fluorescence-based and fully implantable glucose sensor. The system was investigated over a 90 day period in eight U.S. centers in the PRECISE II Study (A Prospective, Multicenter Evaluation of the Accuracy of a Novel Continuous Implanted Glucose Sensor).

Eversense CGM System



Sensor | Smart Transmitter | Mobile App

The Eversense CGM System utilizes a long-term implantable glucose sensor powered by an external, wearable smart transmitter through a wireless inductive link. The sensor is fluorescence-based and developed for subcutaneous insertion in the upper arm. The smart transmitter wirelessly communicates with the mobile app to display real-time glucose readings, trends, and alerts.

Sensor

- Sensor lasts up to 90 days
- Five minute insertion procedure
- No weekly sensor insertion
- No open wound

Smart Transmitter

- Removable and rechargeable
- On-body vibration alerts
- Gentle-on-skin adhesive
- Wireless, secure, encrypted BLE communication with smartphone

Mobile App

- View real-time glucose readings
- Use your own smartphone - no extra device to carry
- iOS and Android compatible
- Customizable alert settings and reports

Materials and Methods

Ninety (90) study subjects were enrolled at 8 clinical sites and implanted with the sensor in their upper arm (a subset of 15 subjects had 2 sensors inserted bilaterally). Subjects were asked to wear the transmitter over the sensor at all times and follow a calibration procedure twice daily. Subjects were blinded to the glucose readings from the CGM at all times. The accuracy of the system was evaluated during 4 in-clinic visits where venous reference glucose measurements were taken (YSI 2300 Stat Plus) to compare with the glucose measurements from the Eversense CGM. The primary safety objective was measured as the incidence of device-related or sensor insertion/removal procedure-related adverse events.

Results

Measure	Level	Result
Mean AD (mg/dL)	≤ 80 mg/dL	9.6
Mean ARD (%)	> 80 mg/dL	8.2
Mean RD (%)	All Results	-1.0
Mean ARD (%)	**All Results (n=16,653)**	**8.8**

MARD Calculated from Primary Effectiveness Population (N=82). The Eversense CGM System was highly accurate compared with the reference YSI measurements through 90 days post- insertion.

Days after Insertion	Percent of System Readings Within			
	15/15% of YSI	20/20% of YSI	30/30% of YSI	40/40% of YSI
1-30	86.1%	92.6%	97.6%	99.0%
31-60	88.2%	95.4%	98.8%	99.7%
61-90	82.3%	92.2%	97.9%	99.6%
Full Study	**86%**	**93%**	**98%**	**99%**

CGM System Stability in Successive Intervals . For each percentage target, there was very little difference in the proportions within the target over three successive intervals Days 1-30, 31-60, and 61-90.

SAE by relationship to Study	Number of SAEs	Subjects with SAEs (%)	95% Confidence interval
All SAEs	1	1 (1.1%)	0.0%-6.0%
Device Related SAEs	0	0 (0.0%)	0.0%-4.0%
Sensor Procedure Related SAEs	1	1 (1.1%)	0.0%-6.0%
Study Procedure Related SAEs	0	0 (0.0%)	0.0%-4.0%
Unrelated to Study SAEs	0	0 (0.0%)	0.0%-4.0%

The rate of serious adverse events related to the device or the insertion/removal procedure was low – approximately 1%.

Event Physiologic System	Number of Events 14	Number of Subjects (%) 7(7.8%)
Dermatological	**8**	4 (4.4%)
Bruising	2	
Erythema	2	
Pain/Discomfort	4	
Musculoskeletal/Rheumatologic	**1**	1(1.1%)
Pain/Discomfort	1	
Neurological	**2**	2(2.2%)
Paresthesia	1	
Syncope-vasovagal	1	
Other	**3**	3(3.3%)
Device fragment not recovered	2	
Surgical procedure to remove sensor	1	

All of the adverse events that were device and/or insertion/removal procedure related or possibly related were considered to be expected events and routine for a subcutaneous implant.

Conclusions

The Eversense CGM demonstrates both an excellent safety profile and sub 9.0% MARD accuracy during continuous use for up to 90 days.

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