Appendix 1

Signature Manifest

Document Number: CTR-0034 Revision: 02

Title: Use of Real-World Data from PMCF

All dates and times are in Eastern Standard Time.

Use of Real-World Data from PMCF

Approval

Name/Signature	Title	Date	Meaning/Reason
Katherine Tweden (KTWEDEN)	Vice President, Clinical Scien	12 Feb 2018, 12:09:30 PM	Approved
Lynne Kelley (LKELLEY)	Chief Medical Officer	12 Feb 2018, 12:17:34 PM	Approved
Colleen Mdingi (CMDINGI)	Group Leader, Clinical DB Mgmt.	12 Feb 2018, 12:39:03 PM	Approved
Haritha Haridas (HHARIDAS)	Senior Regulatory Scientist	12 Feb 2018, 12:39:57 PM	Approved

Quality Approval

Name/Signature	Title	Date	Meaning/Reason
DAWIT BELETE (DBELETE)	Sr. Manager, Quality Sciences	12 Feb 2018, 01:19:27 PM	Approved



CTR-0034 Document #: **Use of Real-World Data from PMCF** Revision: Title: 02

Effective Date: 12 Feb 2018 1 of 16 Pages:

Senseonics, Incorporated

Use of Real-World Data from the Post Market Clinical Follow-up (PMCF) Registry for **Eversense® Continuous Glucose Monitoring (CGM) System**

12 February 2018

Manufacturer Name & **Address:**

Senseonics, Incorporated 20451 Seneca Meadows Parkway Germantown, MD USA 20876



Document #: CTR-0034 Title: Use of Real-World Data from PMCF Revision: 02

> Effective Date: 12 Feb 2018 Pages: 2 of 16

Table of Contents

1.	SYNOPSIS	3
	INTRODUCTION	
	USE OF REAL-WORLD DATA FROM THE EUROPEAN PATIENT REGISTRY	
4.	OBJECTIVE	9
5.	METHODS	9
6.	RESULTS	10
7.	CONCLUSION	15
8	REVISION HISTORY	16



		Document #:	CTR-0034
Title:	Use of Real-World Data from PMCF	Revision:	02
		Effective Date:	12 Feb 2018
		Pages:	3 of 16

1. Synopsis

Registry Title:	A Post Market Clinical Follow-up (PMCF) to demonstrate long term safety of the Eversense Continuous Glucose Monitoring System (CGM)
Number of Countries:	PMCF is currently active at 350 centers in 14 countries.
Study Design:	Prospective, all-comers patient registry at the participating centers.
Primary Investigation Objective:	To demonstrate the long-term safety of the Eversense CGM System
Primary Endpoint	The rate of serious device-related, procedure-related, or drug (dexamethasone acetate) related adverse events through approximately 4 sensor insertion/removal cycles
Secondary Endpoints	 The rate of all serious device, procedure, or drug related adverse events (AEs) over time at each sensor placement cycle through 4 sensor insertion/removal cycles The absence of plasma dexamethasone after 4 sensor insertion/removal cycles The rate of serious adverse events attributed to the low dose exposure of dexamethasone acetate over time at each sensor placement cycle through 4 sensor insertion/removal cycles
Number of Patients:	All patients will be enrolled and followed at the participating centers until 100 patients have been followed through 4 sensor insertion/removal cycles.
Inclusion/ exclusion criteria:	 Inclusion criteria: All patients who are recommended for placement of the Eversense CGM System are included in the post market registry. Patients must have a diagnosis of diabetes and be ≥ 18 years of age. Exclusion criteria:
	solutions. • Patients who are pregnant.



		Document #:	CTR-0034
Title:	Use of Real-World Data from PMCF	Revision:	02
		Effective Date:	12 Feb 2018
		Pages:	4 of 16

Methods:	Data for patients placing the Eversense CGM System will be included in PMCF database. Patients will be considered a part of the PMCF when they have received and understood the product training, and had their first sensor inserted. Patients will remain in the registry as long as they continue to use the Eversense CGM System until 4 sensors have been inserted and removed. Patients will undergo a physical examination of all sensor insertion/removal sites. Device, drug related, and insertion/removal related adverse events and serious adverse events will be documented. A blood sample will be obtained from a subgroup of consenting patients approximately 12 months post first insertion for Dexamethasone testing.
Duration:	Approximately 36 to 48 months
Subject follow up:	Patients will return to the clinic at the end of life of each sensor for exchange of the sensor in the opposite arm and for routine follow up of their diabetes.

2. Introduction

The purpose of the prospective PMCF (European Patient Registry) is to confirm the long term safety of the Eversense Continuous Glucose Monitoring (CGM) System. It is intended to build upon the safety and performance demonstrated by the Eversense CGM System in clinical studies, and to evaluate the long term safety of the system after repeated insertions.

Specific attention is focused on whether patients have any adverse events as a result of repeated sensor insertions over time that were not recognized during the PRECISE study as it involved single cycle of sensor insertion/removal. Long term safety through identification of any unexpected adverse events due to the multiple insertions over time of the sensor is the primary question that is being addressed by the PMCF.

3. Use of Real-World Data from the European Patient Registry

The Agency requested an assessment of how patient risks may accrue over time from the use of the Eversense CGM System. As part of this risk assessment, Senseonics is proposing to use real-world data (RWD) collected from a prospective, patient registry conducted at multiple sites in Europe (referred to here as the European Patient Registry) to inform the risk-based assessment, and to demonstrate that the risks for use of the Eversense CGM System have been sufficiently mitigated to provide a reasonable assurance of device safety.

In May 2016, the Eversense CGM System received CE mark authorization and became commercially available in Europe in June 2016. As part of the CE mark authorization, Senseonics committed to conducting a Post Market Clinical Follow-up (PMCF) registry to



Title: Use of Real-World Data from PMCF

Document #: CTR-0034

Revision: 02

Effective Date: 12 Feb 2018

Pages: 5 of 16

collect safety data on long term use of the Eversense CGM System, specifically repeat Sensor insertions. Fourteen (14) countries with 338 centers in Europe and 12 centers in South Africa are currently enrolling patients into the registry. For simplicity, this study is referred to as the European Patient Registry.

In these countries, every patient who receives an Eversense CGM System is enrolled. The European Patient Registry as of 2 February 2018 remains open and is enrolling all inserted patients. The registry will remain open and continue to follow all patients until 100 patients have completed 4 insertion/removal cycles. As a prospective study, follow-up visits are scheduled according to standard medical practice every 3 to 6 months, when the Sensor requires replacement. (Please note that Sensor initially had a wear period of up to 90 days under its first CE mark authorization, but that has been extended to up to 180 days.) Prospective safety data are collected at study visits, using standardized procedures and data collection procedures. Thus, the European Patient Registry provides a scientifically valid real-world evidence (RWE) to be considered in the risk assessment of the Eversense CGM System. Such RWE provides an efficient and scientifically valid data set for FDA to consider in its premarket assessment of the safety the Eversense CGM System.

The Agency has issued a guidance document on the use of RWE to support regulatory decision-making for medical devices and how RWE may constitute valid scientific evidence. This includes important relevant factors that the Agency will assess to determine if RWE and RWE are suitable for regulatory use (pages 13-16 of the guidance document). **Table 1** outlines how the European Patient Registry compares to these factors, demonstrating that the European Patient Registry fulfills the recommendations for RWD and RWE. The Agency has also issued a guidance document on the use of clinical studies for medical devices conducted outside of the United States (OUS), and factors to consider for using OUS data to support regulatory decisions. Table 2 provides a comparison of these considerations to demonstrate the European Patient Registry data fulfill these recommendations.

The European Patient Registry provides an ethically-derived, scientifically valid data set, studying the safety of Eversense CGM System in the adults with diabetes using proscribed methods and data collection, providing valuable supportive information for consideration in the risk assessment.

¹ Use of Real-World Evidence to Support Regulatory Decision-Making for Medical Devices. Guidance for Industry and Food and Drug Administration Staff. Document, issued on August 31, 2017.

² Acceptance of Medical Device Clinical Data from Studies Conducted Outside the United States. Draft Guidance for Industry and Food and Drug Administration Staff. Document, issued on April 22, 2015.



		Document #:	CTR-0034
Title:	Use of Real-World Data from PMCF	Revision:	02
		<i>Effective Date:</i>	12 Feb 2018
		Pages:	6 of 16

Table 1: Factors for Consideration for the Use of Real-World Data (RWD) and Real-World Evidence (RWE) from the European Patient Registry to Support the Risk Assessment

	from the European Patient Registry to Support the Risk Assessment			
	tor for Consideration to Use RWD and RWE	European Patient Registry (EPR)		
for Regulatory Purposes				
Scie	ntific relevance factors for consideration			
1.	Does the RWD contain sufficient detail to document device use and patient outcomes?	Yes. The EPR is a multicenter, prospective study, following a uniform protocol, in which CGM system use, such as sensor insertion, are recorded via Senseonics electronic Data Management System (DMS). Sensor insertion, use and removal are documented for each patient. This includes repeat use. Patient safety outcomes are documented using registry-specific case report forms (CRFs).		
2.	Are data elements available for analysis to address specific research questions?	Yes. The EPR uses a prospective protocol for patient evaluation and adverse event evaluation and data collection. Data are recorded on electronic CRFs for patient safety outcomes. Thus, valid data are available to address safety questions associated with repeat use.		
3.	Is the real-world population representative of the intended use population?	Yes. The real-world patient population in the EPR and the intended use population are the same – that is, adult patients with diabetes who wish to use a CGM system adjunctively. As this is an all-comers, patient registry design, in which all patients who wish to use the CGM system at the center participate in the registry. Thus, the patient population is representative of the intended use population.		
4.	Is the real-world population of health care professionals, representative of commercial use?	Yes. The real-world population of health care professional is representative of commercial use. The physicians participating in the EPR must undergo the same CGM system training program as will be offered in the US upon approval. This is the same training program as the investigators in the US underwent for the investigational studies. It is also the same training program proposed for post-market use in the US. The EPR includes a large number of centers providing further experience with the training program among more physicians.		
5.	Does the RWD capture an overall percentage of patients?	Yes. It captures 100% of patients at the EPR sites. Every patient who receives an Eversense CGM System at participating sites participates in the patient registry. The EPR is an "all-comers design."		
6.	Does the study design/protocol appropriately address the regulatory question?	Yes. The EPR uses a protocol specifically designed to collect patient safety data, and includes specific procedures for evaluating the sensor insertion and removal sites. Patient follow-up visits are scheduled according to		



Title: Use of Real-World Data from PMCF

Document #: CTR-0034

Revision: 02

Effective Date: 12 Feb 2018

Pages: 7 of 16

		the end of life of the sensor, rather than a protocol-specified time.
7.	Are patient demographics and medical history collected?	No. Patient demographics and medical history are not collected, but such information may be provided by centers to describe and evaluate patient-related adverse events.
8.	Is there a reporting schedule for the RWD?	Yes. There is a reporting schedule for the EPR, including timeframes and date of data cut-off for analysis presented here.
9.	Are the collected data sufficient for assessing outcomes?	Yes. Specific CRF designed to document adverse events is utilized in the study; adverse events are adjudicated by a medical monitor for reporting consistency. Information on CGM system use, such as sensor insertion and removal dates, are recorded via Senseonics electronic Data Management System (DMS).
Reli	ability and data quality factors for consideration	
10.	Are the sites prepared and qualified for RWD collection?	Yes. Sites participating in the EPR are selected based upon their qualifications. The physicians must undergo training in the use, insertion and removal of the CGM system.
11.	Are common data capture forms and definitions used?	Yes. Sensor insertion and use are recorded via Senseonics electronic Data Management System (DMS). Sensor removal is also documented for each patient. Patient safety outcomes are documented using registry-specific case report forms (CRFs). Common definitions for adverse events are provided to the sites.
12.	Is there an adherence to a common timeframe for patient evaluation and data collection?	Yes. The EPR protocol specifies common timeframes for patient visits that are related to the end of sensor life, rather than based upon a calendar timeframe. Patient follow-up visits are scheduled according to the end of life of the sensor, rather than a protocol-specified time, to facilitate removal and insertion of a new Sensor consistent with its use in the commercial, post-market setting.
13.	Are standard scientific methods followed for clinical research?	Yes. The EPR protocol and analysis plan followed standard scientific methods; both the protocol and analysis plan were prospectively developed.
14.	Do the patient selection and enrollment procedures minimize bias?	Yes. The EPR is an all-comer's design at the participating sites, minimizing bias.
15.	Are the data ethically derived, and have patient protection measures been put in place?	Yes. The data are ethically derived, and patient protection measures have been put in place. Procedures are in place to protect patient privacy in that the Sponsor remains



Document #: CTR-0034 Title: **Use of Real-World Data from PMCF** Revision: 02 Effective Date: 12 Feb 2018 Pages: 8 of 16

masked to any patient identifiers, meeting the countryspecific requirements for a post-market patient registry.

Table 2: Comparability Assessment between the US Pivotal Studies and the EPR Study

Parameter	Able 2: Comparability Assessment between the US Pivotal Studies and the EPR Study Parameter US Europe Comparability				
rarameter	US	Europe	Assessment		
Medical Practice – Standard of Care	Patients with Type I and Type II diabetes require regulated and frequent monitoring of blood glucose levels. In addition to the use of self-monitoring blood glucose values through handheld devices, patients may also use CGM systems.	Patients with Type I and Type II diabetes require regulator and frequent monitoring of blood glucose levels. In addition to the use of self-monitoring blood glucose values through hand-held devices, patients may also use CGM systems.	Comparable. Monitoring blood glucose levels is critical to the management of diabetes in both geographies. In both geographies, CGM systems are recognized to provide a valuable tool to aid in monitoring blood glucose levels.		
Target Patient Population	Adults with Type I or Type II diabetes who wish to use a CGM System.	Adults with Type I or Type II diabetes who wish to use a CGM System.	Comparable. Both studies evaluate the safety of the CGM system in the same target patient population.		
Clinician Skill	Investigators in the US clinical studies underwent a training program to use, insert and remove the Eversense CGM System.	All inserting physicians in Europe underwent a training program to use, insert and remove the Eversense CGM System.	Comparable. The same training program is used in both geographies.		
Study Outcome Measures	Adverse events associated with device use, and Sensor insertion and removal were recorded.	Adverse events associated with device use, and Sensor insertion and removal were recorded.	Comparable. Both studies measured the same safety endpoints.		
Device Design	The US studies utilized the device design for which the Sponsor is seeking approval.	In Europe, an earlier design of the Sensor may have been in some of the initial patients. The earlier design had a marginally shorter Sensor that contained the same DXA collar in a different position.	Comparable. These minor changes are expected to have negligible effects on the safety of the device, and studies using this design provide direct evidence of device safety.		



		Document #:	CTR-0034
Title:	Use of Real-World Data from PMCF	Revision:	02
		<i>Effective Date:</i>	12 Feb 2018
		Pages:	9 of 16

4. Objective

The primary objective of the registry is to demonstrate the long-term safety of the Eversense CGM System. The rate of serious device-related, procedure-related, or drug (dexamethasone acetate) related adverse events through approximately 4 sensor insertion/removal cycles.

The secondary endpoints are the following;

- The rate of all serious device, procedure, or drug related AEs over time at each sensor placement cycle through 4 sensor insertion/removal cycles
- The absence of plasma dexamethasone after 4 sensor insertion/removal cycles
- The rate of serious adverse events attributed to the low dose exposure of dexamethasone acetate over time at each sensor placement cycle through 4 sensor insertion/removal cycles

5. Methods

Safety is evaluated by examination of the sensor sites at each in-clinic visit and documentation of adverse events (AEs) occurring in the clinic and during home use. At each visit, adverse events that occur during the visit and that occurred during home use since the previous visit are recorded and reported. Patients are asked to provide information on any hospitalizations and any change in systemic immune function (e.g., problem with wound healing) that may have occurred. Assessments of the sensor implantation and explant sites take place by the physician at each placement with physical exam and documentation. The exam includes current and all previous sensor sites, as well as the surrounding area, to capture any skin reactions resulting from attachment of the transmitter to the skin. De-identified patient data are sent to Senseonics and entered into an electronic database.

The list of key device and procedure-related anticipated adverse events is provided below.

- Adhesive Patch Location Site Irritation including redness, excoriation or ulceration
- Sensor Location Site Pain/Discomfort
- Sensor Location Site Redness
- Sensor Location Site Infection
- Skin atrophy (thinning of the skin as compared to adjacent skin) over the Sensor
- Skin depigmentation (loss of coloration as compared to adjacent skin) over the Sensor
- Prolonged wound healing of incision after insertion or removal (beyond expected 5-7 days)

An AE is designated as a Serious Adverse Event (SAE) if it meets the following criteria.

- Led to death
- Led to serious deterioration in the health of the patient, that either resulted in
 - a life-threatening illness or injury, or



Title: Use of Real-World Data from PMCF

Document #: CTR-0034

Revision: 02

Effective Date: 12 Feb 2018

Pages: 10 of 16

- a permanent impairment of a body structure or a body function, or

- in-patient or prolonged hospitalization, or

- medical or surgical intervention to prevent life-threatening illness or injury or permanent impairment to a body structure or a body function,
- Led to fetal distress, fetal death or a congenital abnormality or birth defect.

6. Results

The registry is actively enrolling patients in multiple centers in Europe and South Africa. **Table 3** provides the number of centers, by country, where the registry is currently active, as of Feb 2, 2018.

Table 3: Number of Active Centers by Country

Country	Number of Centers
Austria	12
Belgium	4
Denmark	4
Finland	4
Germany	120
Italy	116
Netherlands	1
Norway	2
Poland	18
South Africa	12
Spain	11
Sweden	33
Switzerland	9
United Kingdom	4
Total	350

As of Feb 2, 2018, 1,686 patients have enrolled in the registry. These patients have received 2,386 insertions under real-world use conditions. Eleven hundred and fourteen (1,114) patients are currently wearing their first sensor, 285 patients are on their second sensor, 78 are on the third, 19 on fourth, 25 on the fifth, 11 on the sixth and 3 patients have had the seventh sensor implanted. One-hundred and fifty-one (151) patients have discontinued use of the system. Majority of the patients who discontinued post-first sensor cycle (85 of the 104), stopped using the system due to lack of medical reimbursement. The total registry enrollee time on-device is 173,658 days. The average time on-device per enrollee is 103 days with a minimum of 1 and maximum of 652 days. 2.97% (50 of total 1,686) of enrollees have been on device for more than a year. **Table 4** provides a summary of the current enrollment status.



Document #: CTR-0034 **Use of Real-World Data from PMCF** Title:

Revision: 02

Effective Date: 12 Feb 2018 Pages: 11 of 16

Table 4: PMCF Enrollment Summary

Number of Patients	1st Insertion Cycle	2 nd Insertion Cycle	3 rd Insertion Cycle	4 th Insertion Cycle	5 th Insertion Cycle	6 th Insertion Cycle	7 th Insertion Cycle
Total inserted	1686	443	143	58	39	14	3
Currently wearing	1114	285	78	19	25	11	3
Continued to next insertion	443	143	58	39	14	3	0
Discontinued	129	15	7	0	0	0	0

Of the 2,386 sensors used in the registry, 756 were of the original configuration that were used in the European pivotal study. The remaining 1,630 sensors used in the registry are the same configuration as in the US pivotal study. One hundred and forty-eight (148) Gen-1 transmitters were used and the remaining are all Gen-2 transmitters. A summary of the sensors and transmitters used in the registry is provided in **Table-5**.

Table 5: Summary of Sensor and Transmitter Configurations Used

Device component	Configuration	Numbers Used
Sensor	EU pilot	756
(2,386 total)	US pilot	1,630
Transmitter	Generation-1	148
(1,999 total)	Generation-2	1,851

Sixty-six (66) adverse events have been reported as of February 2, 2018. There have been no serious adverse events related to the device or the insertion/removal procedure and no unanticipated adverse events. Table 6 provides a summary of the adverse events considered potentially related to the device and/or insertion/removal procedure, with the percentage of occurrence and rate per 100 patient-years of exposure to device.



Document #: CTR-0034 **Use of Real-World Data from PMCF** Title:

Revision: 02

Effective Date: 12 Feb 2018 Pages: 12 of 16

Table 6: Summary of AEs Related or Probably/Possibly Related to Device and/or Procedure

Device and/or Procedure Related (or Probably/Possibly Related) AEs	Number of Events	Percentage of Occurrence (N = 1686)	AE Rate per 100 Patient-years of Exposure
SAEs	0	0	0
Sensor location site infection	14	0.8	2.9
Skin atrophy over sensor	1	0.1	0.2
Skin atrophy over sensor with discoloration*	3	0.2	0.6
Skin discoloration	3	0.2	0.6
Adhesive patch location site irritation	7	0.4	1.5
Prolonged wound healing after procedure	3	0.2	0.6
Sensor location site pain/discomfort	1	0.1	0.2
Unable to remove sensor at first attempt	9	0.5	1.9
Bruising	3	0.2	0.6
Sensor location site redness/reaction to dressing	3	0.2	0.6
Other - Sensor broke during removal	3	0.2	0.6
Other - Patient fainted during procedure	Î	0.1	0.2
Other - Hematoma	1	0.1	0.2

^{*} Relatedness unable to be determined for two cases of skin atrophy over sensor with skin discoloration

There were 16 cases of infection; 2 unrelated to the device or procedure and 14 related to the device or procedure. The rate of infection is comparable to other diabetes product. The rate of infection with Eversense Sensor is 14 infections per 173,658 patient-days of wear, or 2.9 infections per 100 patient-years of exposure. Infection rate for insulin infusion sets is 7.3 - 11.5per 100 patient-years of exposure³.

Two cases of infection were adjudicated to be not related to device or procedure as explained here. One patient had a severe bacterial infection in the leg involving the upper dermis and extending into the superficial cutaneous lymphatics, which the physician believed was the origin of the infection, with secondary seeding of the sensor via translocation of bacteria from the patient's hands to skin lesions near the sensor. To rule out the possibility of contribution to the risk from exposure to dexamethasone in the CGM sensor, a blood level of dexamethasone was obtained as detailed in the protocol to ensure that there was no relationship to steroid exposure. The level was undetectable (detection limit <2.00 ng/mL). The second infection was confounded by extended hospitalization with intravenous antibiotics for tonsillitis. No blood level of dexamethasone was obtained in this case as the sponsor was notified after the event. In both cases, the sensor was successfully removed, and the placement sites healed.

³ Diabetes Control and Complications Trial Research Group. Diabetes Care, Volume 18, Number 3, March 1995.



Title: Use of Real-World Data from PMCF

Document #: CTR-0034

Revision: 02

Effective Data: 12 Feb 2018

Effective Date: 12 Feb 2018 Pages: 13 of 16

Fourteen (14) cases of infection related to the device or procedure occurred within days of insertion and were adjudicated to be definitely or possibly/probably related to the sensor insertion procedure. Four of the 14 cases occurred in 2 patients who had 2 separate occurrences of infection after placement of each of their first and second Sensors. Both patients were treated with proper incision care and a short course of antibiotics after their first infection. The Sensors went on to function as intended. The subsequent occurrence of the second infection led to Sensor removal by the treating physician. Insufficient information was provided by the clinic to determine the reason for repeat infections in the first patient. The second patient demonstrated noncompliance to the post-procedure incision care instructions after their first insertion (i.e., taking multiple showers on post-procedure Day 1 and removing both the dressing and Steri-Strip®) allowing the edges of the incision to separate resulting in an infection. During the second Sensor insertion in this patient, the physician proactively used a suture to close the incision. There is no further information regarding adherence to post-procedure instructions and the patient developed an infection within days of insertion. Of the remaining 10 infections, 7 resulted in Sensor removal with no further complications or progression of infection. Of the other 3 reported infections, one appeared to have resolved with no antibiotic treatment without sensor removal, one had no follow up information despite queries, and one is under current investigation.

For centers that reported two or more infections or the circumstances around the infections were not clear, retraining on sterile technique and/or incision closure was undertaken. In addition, after the first few instances of infections, a review of the training program and instructions was performed. Changes were made to the primary training of both physicians and patients, where incision care was emphasized, and a take home wound care instruction document developed, which is now being provided to patients.

There have been a total of 7 adverse events attributed to skin changes. These have been reported as skin atrophy (N=1), skin atrophy with discoloration (N=3) and skin discoloration (N=3). The isolated atrophy has recently been reported and is still under investigation. There was reported resolution of 1 case of atrophy with skin discoloration and no follow up available for the other two cases. For the isolated skin discoloration there is one reported resolution and two with no follow up provided.

There have been 7 reported cases of adhesive patch irritation. These irritations were mild and of limited duration. All subjects reported resolution of the irritation and continuation of the use of CGM system.

There were three events where the body of the sensor broke during removal. One of these events occurred when the physician tried to remove the sensor with a clamp that had teeth (kocher clamp) that damaged the sensor, resulting in breakage. These clamps were different than the instruments recommended for sensor removal. For the second and third cases of sensor breakage, little information is available on the removal procedure other than all parts of the sensor were successfully removed, and the physician disposed of the removed sensor and therefore, no



Document #: CTR-0034 **Use of Real-World Data from PMCF** Title:

Revision: 02

Effective Date: 12 Feb 2018 Pages: 14 of 16

follow-up investigation could be done. Senseonics is currently updating physician training material to further emphasize the use of proper instruments and procedure, and also to emphasize that any sensors that break during procedure should promptly be returned to Senseonics for investigation.

The safety data were also analyzed by insertion/removal cycle (see **Table 7**). Based on the results in **Table 7**, the safety profile following repeat insertions is unremarkable, indicating that there are no additional or new risks associated with long-term use of the Eversense CGM System.

Table 7: Summary of AEs Related or Probably/possibly Related to Device and/or Procedure, over Time with **Repeated Insertions**

Device and/or procedure related (or probably/possibly related) AEs	Post Insertion 1 (%) (N= 1686)	Post Insertion 2 (%) (N= 443)	Post Insertion 3 (%) (N= 143)	Post Insertion 4 (%) (N= 58)	Post Insertion 5 (%) (N=39)	Post Insertion 6 (%) (N= 14)	Post Insertion 7 (%) (N= 3)
SAEs	0	0	0	0	0	0	0
Sensor location site infection	8 (0.5%)	4 (0.9%)	2 (1.4%)	0	0	0	0
Skin atrophy over sensor	1 (0.1%)	0	0	0	0	0	0
Skin atrophy over the sensor with skin discoloration	2 (0.1%)	1 (0.2%)	0	0	0	0	0
Skin discoloration	1 (0.1%)	2 (0.5%)	0	0	0	0	0
Adhesive patch location site irritation	5 (0.3%)	0-0	2 (1.4%)	0	0	0	0
Prolonged wound healing after procedure	3 (0.2%)	0	0	0	0	0	0
Sensor location site pain/discomfort	1 (0.1%)	0	0	0	0	0	0
Unable to remove sensor at first attempt	7 (0.4%)	2 (0.5%)	0	0	0	0	0
Bruising	1 (0.1%)	1 (0.2%)	0	1 (1.7%)	0	0	0
Sensor location site redness/reaction to dressing	3 (0.2%)	0	0	0	0	0	0
Other - sensor broke during removal	3 (0.2%)	0	0	0	0	0	0
Other - patient fainted during procedure	1 (0.1%)	0	0	0	0	0	0
Other - Hematoma	0	0	0	1 (1.7%)	0	0	0

CGM accuracy was evaluated against the fingerstick values that patients enter into the Mobile Medical Application (MMA). This analysis was performed to provide an overall assessment of system performance in the post-market setting although it is recognized that the use of selfmonitoring blood glucose values, rather than a standardized reference method will result in more

Confidential Page 15 of 17 Senseonics



		Document #:	CTR-0034
Title:	Use of Real-World Data from PMCF	Revision:	02
		<i>Effective Date:</i>	12 Feb 2018
		Pages:	15 of 16

variability. Thus, it is expected that the accuracy measurements from the post-registry study will show more variation than those estimated from the premarket clinical studies. Sensor accuracy average over time, for the number of sensor cycles, ranges from 12.8% to 14.3%. The seventh sensor cycle was excluded from this analysis given the small number of samples (N=3). **Figure-1** provides the fingerstick to CGM accuracy for the different sensor cycles.

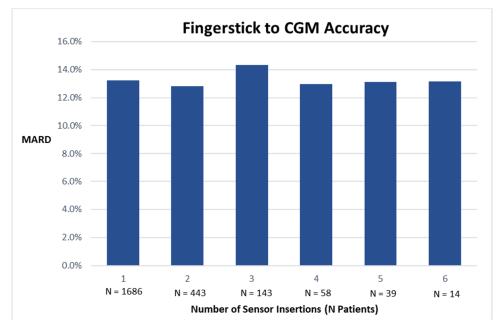


Figure 1: Fingerstick to CGM Accuracy

7. Conclusion

The results from the European Patient Registry build upon the safety and performance of the Eversense CGM System. A total of 1,686 patients have been enrolled in the study at trained centers in 14 different countries.

A total of 66 adverse events have been reported so far of which 52 events are related or probably/possibly related to the device and/or senor insertion/removal procedure. There have been no Serious Adverse Events (SAE) or unanticipated adverse events related to the device, sensor insertion/removal procedure or exposure to dexamethasone acetate reported so far.

The safety profile for repeat insertions/removals is very similar to the safety profile for the first sensor insertion/removal, demonstrating the safety of the Eversense CGM System and providing real world evidence to quantify the risks associated with repeat sensor insertion/removal. The sensor accuracy to fingersticks (SMBG) also stays consistent over repeat insertion/removal cycles.



		Document #:	CTR-0034
Title:	Use of Real-World Data from PMCF	Revision:	02
		Effective Date:	12 Feb 2018
		Pages:	16 of 16

The registry will continue to monitor the clinical performance and safety of the Eversense CGM System.

8. Revision History

	Revision	Revision Author	Revision Description
	01	Haritha Haridas	Initial release
Ī	02	Haritha Haridas	Updated results with recent data from PMCF (February 2, 2018)