Abbott	Clinical Investigation Plan Cover Page

NCT Number: NCT02757430
EnSite™ Precision V2.0 Registry- Redacted Clinical Investigation Plan
Study Document No: ABT-CIP-10269 (reference #SJM-CIP-10111)
Version B
Date: 25 January 2019

Sponsor

St. Jude Medical, Inc.
5050 Nathan Lane
Plymouth, MN 55442
USA

Clinical Investigational Plan

Reference:
SJM-CIP-10111

"EnSite™ Precision V2.0 Registry"

Redacted Clinical Investigation Plan (CIP)

Sponsor St. Jude Medical, Inc.

PRINICPAL INVESTIGATOR SIGNATURE PAGE

EnSite Precision 2.0 Registry

Version A

Reference #: SJM-CIP-10111

I have read and agree to adhere to the clinical investigational plan and all regulatory requirements applicable in conducting this registry.

Principal Investigator

Printed name: _____

Signature:_____

Date: _____

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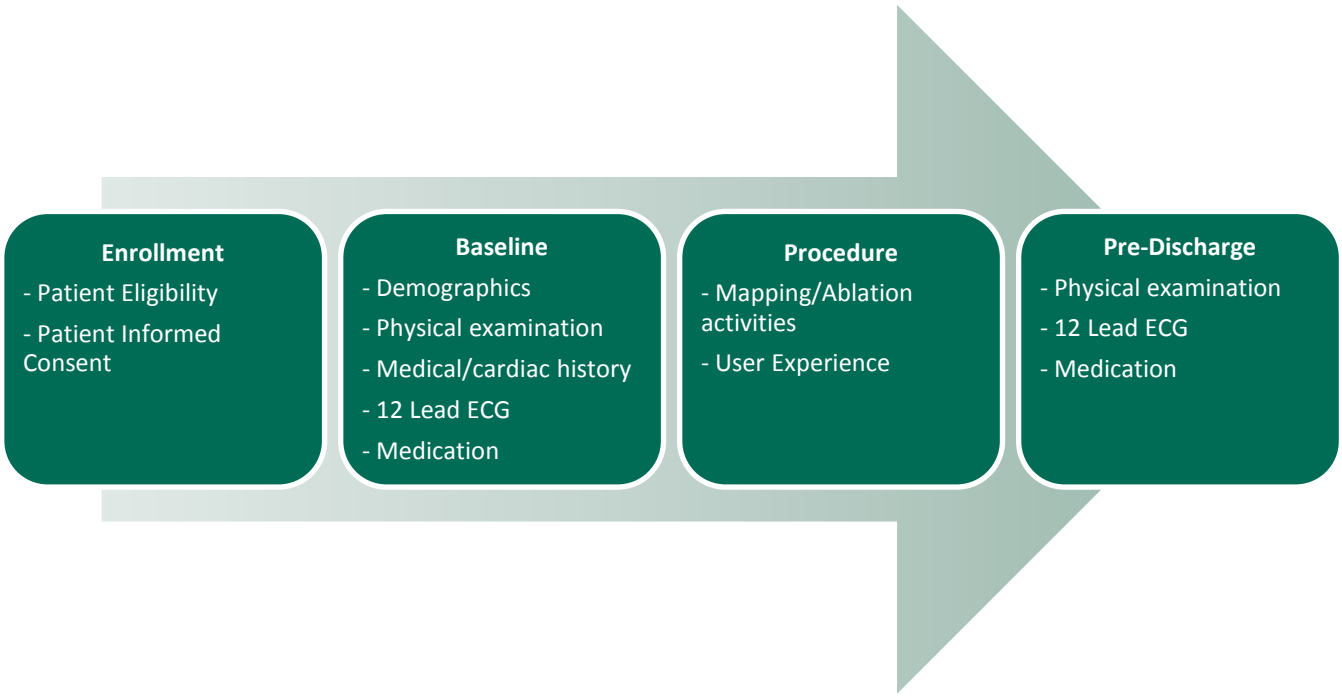
1.0 SYNOPSIS

Title:	EnSite Precision™ Cardiac Mapping System and EnSite Precision™ Software v2.0 Observational registry
Acronym:	EnSite Precision™ 2.0 Registry
Purpose:	The purpose of the registry is to collect data on the EnSite Precision™ Cardiac Mapping System and EnSite Precision™ Software v2.0. This data will be used to evaluate its clinical performance.
Objectives:	The objective of this registry is to assess and characterize the use and performance of the EnSite Precision™ Cardiac Mapping System and the EnSite Precision™ Software V2.0 in a variety of electrophysiological (EP) procedures and clinical settings. This registry will assess the clinical performance of the system in a controlled, real-world environment after commercial release.
Endpoints:	The assessments on the system will include the following: - EnSite Precision™ Cardiac Mapping System Assessment - EnSite Precision™ Software V2.0 Assessment - AutoMap™ Module Assessment - AutoMark feature Assessment The descriptive endpoints for characterizing and evaluating the system are as follows: Primary Endpoints: - EnSite Precision™ Software V2.0 Assessment o Accuracy of geometry o Overall system stability o Unrecoverable shifts - AutoMap™ Module Assessment o Mapping time associated with (re-)mapping one or multiple arrhythmias in a single patient with a variety of catheters ▪ Manual mapping ▪ AutoMap™ ▪ TurboMap™ o Point density associated with (re-)mapping one or multiple arrhythmias in a single patient with a variety of catheters Secondary Endpoints: - EnSite Precision™ Cardiac Mapping System Assessment o Ease of use o Overall procedure time - AutoMark feature Assessment o Clinical Utility of the automated RF marker placement o Ease of Use of the automated RF marker placement

Design:	This is a multi-center, observational, prospective registry. Up to 500 subjects will be enrolled in up to 50 sites worldwide. Data will be collected at enrollment/baseline, procedure and pre-discharge. There is no long-term follow-up required for this registry. The anticipated registry enrollment is about 6-7 months.
Devices used:	All devices must have CE mark and will be used according to their Instructions for Use (IFU). This comprises: The EnSite Precision™ Cardiac Mapping System and software v2.0, which consists of: - EnSite Precision™ software 2.0 - EnSite Precision™ Module, Sensor Enabled - EnSite Precision™ Surface Electrode Kit - AutoMap™ Module - AutoMark feature - Advisor™ FL Circular Mapping Catheter, Sensor Enabled™ and/or FlexAbility™ SE Ablation Catheter Additional tools that may be used in this registry (per physician's discretion), include, but are not limited to: - Tacticath™ Ablation Catheter - FlexAbility™ Ablation Catheter - MediGuide™ Platform - Other commercially available catheters to facilitate EP procedures The EnSite™ Amplifier and Display Work Station, required to support the system, will not be evaluated under the scope of this registry.
Registry Population	A patient becomes a subject once he/she has been fully informed about the registry, has agreed to participate and signed & dated the Informed Consent Form (ICF). Any patient undergoing a cardiac EP mapping and ablation procedure, using the EnSite™ Precision Cardiac Mapping system, is considered eligible.
Inclusion/Exclusion Criteria	<u>Inclusion Criteria</u> - Patients indicated for a cardiac EP study and ablation procedure using a 3D mapping system - Over 18 years of age - Ability to provide informed consent for registry participation and be willing and able to comply with the protocol described evaluations <u>Exclusion Criteria</u> - Contraindication to anticoagulation - Presence of thrombus

	- Implanted with mechanical prosthetic heart valve - Recent (<3 months) myocardial Infarction or unstable angina or coronary artery by-pass - Pregnant or nursing - Individuals whose willingness to volunteer in a registry, in the judgement of investigator or public authorities, could be unduly influenced by lack of or loss of the autonomy due to immaturity, or mental disability, or adverse personal circumstances, or hierarchical influence
Data Collection	The use of the EnSite Precision™ Cardiac Mapping System will be assessed by collecting feedback from physicians/operators through specific questions. The performance of the EnSite Precision™ Cardiac Mapping System will be assessed by collecting procedure data and adverse events.

1.1 Registry Flow Chart



2.0 BACKGROUND AND JUSTIFICATION FOR REGISTRY

In the last 20 years, atrial fibrillation (AF) has become one of the most important public health problems and a significant cause of increasing health care costs in Western countries. The prevalence of AF can be estimated at 2%, together with an incidence ranging between 0.23 and 0.41 per 1000 person/years. The number of hospitalizations for AF is 0.25 per year and the number of outpatient contacts is approximately 6 per year. This means that at the present time in the European community, there are approximately 10 million patients with AF and 100 000 - 200 000 with new onset AF. If the estimated prevalence of AF increases by an average of 0.4%, in 2030 the prevalence of AF would be 2.7%-3.3% in a European population with 516-525 million inhabitants [1]. While paroxysmal AF ablations are the most common, the more challenging and less successful procedure is the persistent AF ablation procedure —making up 36%[2] - 45% of all of AF ablations, which is expected to increase over time [2] [3].

Additionally, sudden cardiac death rates range from 50 to 100 per 100 000 in the general population [4]. It is most commonly caused by ventricular tachycardia (VT) deteriorating into ventricular fibrillation (VF), which is fatal within a few minutes if not defibrillated back into a normal rhythm. There are three treatment options for VT, although many patients require a combination: an implantable cardioverter defibrillator (ICD), antiarrhythmic medication and catheter ablation [5]. Usually, a combination of these treatments is the preferred therapy. Ventricular tachycardias (VT) are on the rise, with 56 000 ablation procedures worldwide [6].

The increase in use of both of these ablation types represents an opportunity for the electrophysiology (EP) specific 3D mapping systems due to the increased case complexity and duration—as mapping system precision is a key requirement to maximize the success of these challenging procedures. As a result, the EnSite Precision™ System was developed to introduce features such as DE-MRI image integration, lesion marking automaticity, automatic mapping, and workflow flexibility to aid in the success of complex ablation procedures, including persistent AF and VT.

The registry is designed in such a way as to ensure that the results obtained have clinical relevance and scientific validity and address the registry objectives.

3.0 REGISTRY DESIGN

3.1 Purpose

The purpose of this registry is to collect data on the EnSite Precision™ Cardiac Mapping System and EnSite Precision™ Software V2.0. This data will be used to evaluate its clinical performance.

3.2 Design and Scope

This is a multicenter, observational, prospective registry. The purpose is to characterize data and information collected on the performance of the EnSite Precision™ Cardiac Mapping System and EnSite Precision™ Software v2.0.

The total duration of the registry is expected to be about 1 year. This includes subject enrollment duration, procedure visit, pre-discharge visit and time to close the registry and provide a final report.

As no follow up period is required for this registry, the subject participation will end upon completion of the pre-discharge visit.

3.2.1 Number of subjects required to be included in the registry

Up to 500 subjects will be enrolled in up to 50 sites worldwide. No site can enroll more than 15% (i.e. 75 patients) of the sample size.

Each site is allowed to enroll subjects with any arrhythmia qualified for ablation.

NOTE: A variety of arrhythmias (atrial and ventricular in origin) is strongly recommended.

3.2.2 Estimated time needed to enroll this subject population

The anticipated enrollment duration is roughly 6-7 months. No long-term follow-up is required for this registry.

3.3 Objectives

3.3.1 Objective

The objective of this registry is to assess and characterize the use and performance of the EnSite Precision™ Cardiac Mapping System and the EnSite Precision™ Software V2.0 in a variety of EP procedures and clinical settings. The registry will assess the clinical performance of the system in a controlled, real-world environment after commercial release.

3.4 Endpoints

The assessments on the system will include the following:

- EnSite Precision™ Cardiac Mapping System Assessment
- EnSite Precision™ Software V2.0 Assessment
- AutoMap™ Module Assessment
- AutoMark feature Assessment

The endpoints for characterizing and evaluating the system are as follows:

3.4.1 Primary Endpoints

- EnSite Precision™ Software V2.0 Assessment
  - Accuracy of geometry
  - Overall system stability
  - Unrecoverable shifts

- AutoMap™ Module Assessment
  - Mapping time associated with (re-)mapping one or multiple arrhythmias in a single patient with a variety of catheters
    - Manual Mapping
    - AutoMap™
    - TurboMap™
  - Point density associated with (re-)mapping one or multiple arrhythmias in a single patient with a variety of catheters

3.4.2 Secondary Endpoints

- EnSite Precision™ Cardiac Mapping System Assessment
  - Ease of Use
  - Overall procedure time

- AutoMark feature Assessment
  - Clinical Utility of the automated RF marker placement
  - Ease of Use of the automated RF marker placement

3.5 Inclusion and Exclusion Criteria

A subject, who meets all of the inclusion criteria, and none of the exclusion criteria, is eligible to participate in this registry.

All subjects enrolled in the registry (including those withdrawn from the registry or lost to follow-up) will be accounted for and documented, assigning an identification code linked to their names, alternative identification or contact information.

This log will be kept up to date throughout the registry by the principal investigator or his/her authorized designee. To ensure subject privacy and confidentiality of data this log must be maintained throughout the registry at the site.

To participate in this registry, the subject must meet all of the following inclusion criteria:

3.5.1 Inclusion Criteria

Subjects are eligible for registry participation if they meet all of the following inclusion criteria:

- Patients indicated for a cardiac EP mapping and ablation procedure using a 3D mapping system
- Over 18 years of age
- Ability to provide informed consent for registry participation and be willing and able to comply with the protocol described evaluations

3.5.2 Exclusion Criteria

Subjects are not eligible for registry participation if they meet any of the following exclusion criteria:

- Contraindication to anticoagulation
- Presence of thrombus
- Implanted with mechanical prosthetic heart valve
- Recent (<3 months) myocardial infarction or unstable angina or coronary artery by-pass
- Pregnant or nursing

- Individuals whose willingness to volunteer in a registry, in the judgement of investigator or public authorities, could be unduly influenced by lack of or loss of the autonomy due to immaturity, or mental disability, or adverse personal circumstances, or hierarchical influence

3.6 Subject Population

3.6.1 Subject Screening

All subjects presenting at the site will be screened by a member of the registry team previously trained on the CIP and delegated to do so.

Subjects who do not meet the inclusion/exclusion criteria will not be eligible to participate in this registry.
Subject's enrollment will be validated via the screening tool provided by the sponsor.

Subjects meeting the inclusion/exclusion criteria, and after obtaining confirmation via the screening tool, will be fully informed about the registry and asked to participate in the registry. In the case the subject agrees, a duly signed and dated Informed Consent Form (ICF) will be obtained.

3.6.2 Point of Enrollment

Subjects are considered enrolled in the registry from the moment the subject has provided written Patient Informed Consent. (Refer to section 3.7 for the Informed Consent Process).

3.7 Informed Consent Process

3.7.1 General process

All subjects will be consented, as required by applicable regulations and the center's ethics committee / institutional review board (EC/IRB) (where applicable). Informed consent must be obtained from each subject prior to any registry related activities, other than those related to screening. The consent form must be signed and dated by the subject and by the person obtaining the consent.

The principal investigator or his/her authorized designee will conduct the informed consent process. This process will include a verbal discussion with the subject on all aspects of the registry that are relevant to the subject's decision to participate in the registry.

The subject will be provided with the informed consent form that is written in a language that is understandable to the subject and has been approved by the center's EC/IRB. Failure to obtain informed consent from a subject prior to registry enrollment should be reported to St. Jude Medical within 5 working days and to the reviewing center's EC/IRB consistent with the center's EC/IRB reporting requirements.

3.7.2 Special circumstances for informed consent

3.7.2.1 Subject unable to read or write

Informed consent will be obtained through a supervised oral process if a subject or legally authorized representative is unable to read or write. An independent witness will be present throughout the process. The written informed consent form and any other information will be read aloud and explained to the prospective subject or his/her legally authorized representative and, whenever possible, either will sign and personally date the informed consent form. The witness also signs and personally dates the informed consent form attesting that the information was accurately explained and that informed consent was freely given.

4.0 DEVICES USED

4.1 Device Description

SJM, sponsor of this registry, will ensure that the registry will only start after full CE certification of the EnSite Precision™ System has been obtained, and copies of the CE-certificates and final Instructions for Use have been sent to the relevant ECs/IRBs if required by local regulations.

Table 1: Description of Proposed Devices

Device Component	Model/Type/Version/ Reference	Regulatory status
EnSite Precision™ Software	V2.0 H702496	CE Marked
EnSite Precision™ Module, Sensor Enabled	H702473	CE Marked
EnSite Precision™ Surface Electrode Kit	EN0020-P	CE Marked
AutoMap™ Module	V1.0 H702499	CE Marked
AutoMark feature	V1.0	CE Marked
Advisor™ FL Circular Mapping Catheter, Sensor Enabled™	D-AVSE-D10-F20	CE Marked
	D-AVSE-DF10-F20	
	D-AVSE-D10-F15,	
	D-AVSE-DF10-F15	
FlexAbility™ SE Ablation Catheter	A-FASE-D	CE Marked
	A-FASE-F	
	A-FASE-J	
	A-FASE-DD	
	A-FASE-FF	
	A-FASE-JJ	
	A-FASE-DF	
	A-FASE-FJ	

Descriptions and Instructions for Use are available separately.

Additional tools that may be used in this registry (per physician's discretion), include, but are not limited to:

- Tacticath™ Ablation Catheter
- FlexAbility™ Ablation Catheter
- MediGuide™ Platform
- Other commercially available catheters to facilitate EP procedures

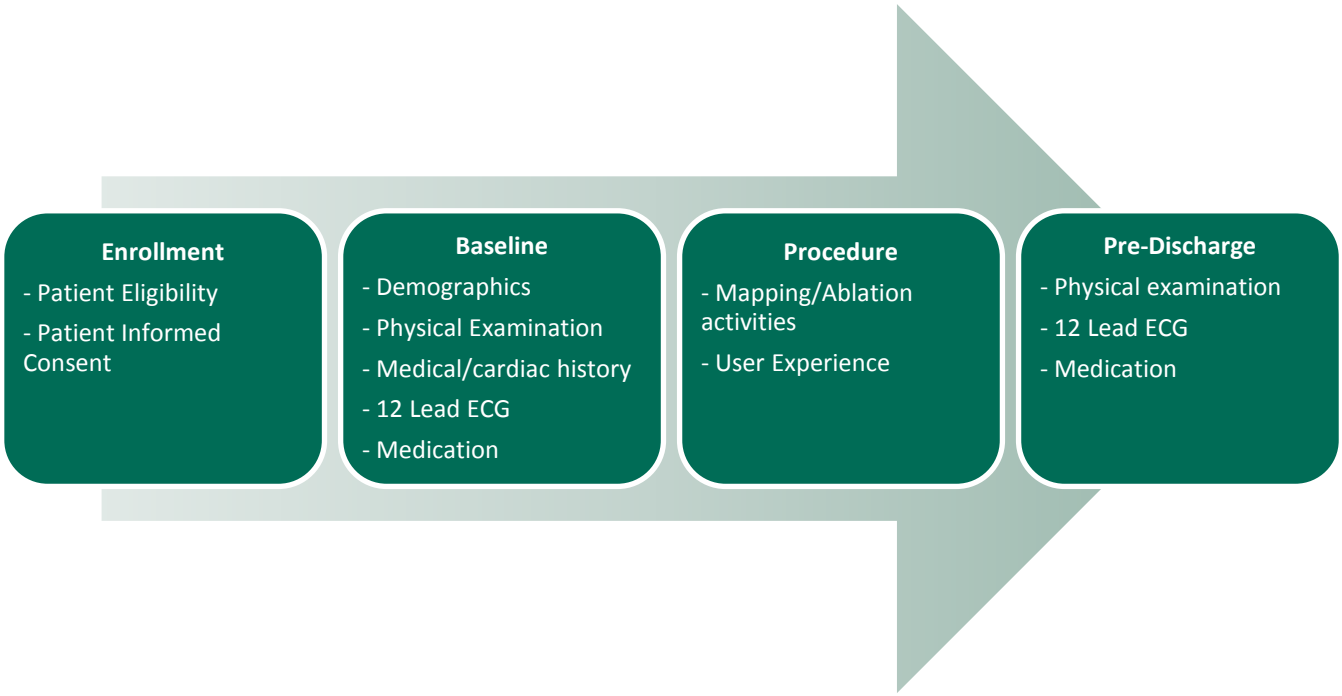
4.2 Device Accountability

Only commercially available shelf-stock will be used
No specific device accountability procedures will be followed.

5.0 PROCEDURES

5.1 Registry Flow Chart

Figure 2: Flow Chart



5.2 Procedures

The registry will be conducted in accordance with the CIP. All parties participating in the conduct of the registry will be qualified by education, training, or experience to perform their tasks and this training will be documented appropriately.

The registry will not commence until St. Jude Medical receives written approval from the EC/IRB (if required by local regulations) and relevant regulatory authorities and all required documents have been collected from the site(s).

Table 2: List of all specific activities/procedures

Visit / Activity	Enrollment	Baseline (Max 10d after Enrollment)	Procedure (Max 14d after Baseline)	Pre-Discharge (Max 7d after Procedure)
Eligibility check	X			
Informed Consent Process	X			
Demographics		X		
Arrhythmia History		X		
Cardiac History		X		
Procedure indication		X		
Previous Arrhythmia Treatments		X		
12-Lead ECG		X		X
Medication		X		X
Physical examination		X		X
Mapping of Cardiac Structures			X	
Catheter Ablation			X	
Fluoroscopy images			X	
Export Study data (USB)			X	
User Experience			X*	
Adverse Event			(X)	(X)
Deviation		(X)	(X)	(X)
Withdrawal		(X)	(X)	(X)
Death			(X)	(X)

(X) if applicable
* Once to be completed by every physician performing a procedure

5.3 Enrollment Visit

The following enrollment activities will be performed after the subject has been screened including using the screening tool - and found eligible per advice of the tool - and must occur before any registry procedure/visit.

- The principal investigator or delegated study personnel are responsible for screening all potential subjects to determine subject eligibility for the registry
- Record enrollment information (name of the registry, date of consent and Inclusion/exclusion confirmation) in the hospital records and complete and submit the Enrollment form in a timely manner (recommended within 5 days)
- Notification of enrollment to the sponsor will take place when the sponsor receives the enrollment form

If a subject does not meet all inclusion criteria or meets any of the exclusion criteria, the subject cannot participate in the registry, even if they have provided consent, and will not be enrolled.

In case the subject was already consented to participate in the registry, but does not meet inclusion/exclusion criteria, the following actions will be taken.

If registry procedure has not occurred:

- Document enrollment information (name of the registry, date of consent and inclusion/exclusion) in the hospital records; complete the Enrollment and Withdrawal Forms. The form must be authorized / approved by the principal or delegated investigator.
    - Inform the subject about the withdrawal.
    - The EC/IRB and CA should be notified appropriately about any deviations with regards to obtaining the informed consent.

If registry procedure has occurred:

- Document enrollment information (name of the registry, date of consent and inclusion/exclusion) in the hospital records; complete the Enrollment and Withdrawal Forms. The form must be authorized / approved by the principal or delegated investigator.
    - Complete study deviation for inclusion/exclusion not met
    - The EC/IRB and CA should be notified appropriately about any deviations with regards to obtaining the informed consent.

5.4 Baseline Visit (within 10 days from enrollment)

The following information will be collected at the baseline visit

- Demographics- include subject's year of birth and gender
- Physical examination- include subject's height, weight, blood pressure (measurements taken during visit)
- Arrhythmia history
    - The types and classification of atrial fibrillation (AF) and atrial tachycardia (AT) are determined in reference to the 2012 HRS/EHRA/ECAS Expert Consensus Statement on Catheter Ablation of Atrial Fibrillation

- The types and classification of ventricular arrhythmias are determined in reference to the 2009 EHRA/HRS Expert Consensus on Catheter Ablation of Ventricular Arrhythmias

- Cardiac history (most recent values closest to baseline visit)
- Indication for procedure - specify type of arrhythmia and information on previous treatments
- Medical history - indicate subject's relevant co-morbidities, previous cardiac procedures
- 12-Lead ECG measurement (most recent ECG available, max. 2 months old)
- Antiarrhythmic medication - indicate both the medication that failed and the medication (if any) the patient is currently taking
- Anticoagulant medication – medication the patient is currently taking
- Any deviation that might have occurred

5.5 Procedure Visit (within 14 days from Baseline visit)

The procedure should be performed according to the instructions for use (IFU) of the EnSite Precision™ Cardiac Mapping System, the IFU of AutoMark feature and AutoMap™ and other medical devices used during the procedure.

Subjects will be prepared according to the standard surgical procedures and standard practice of the center. The procedure should always be done with the aid of fluoroscopy.

Instances where fluoroscopy images should be collected and uploaded via Electronic Data Capture (EDC):

- At procedure start, after initial catheters are in place. Consider placing catheters in reproducible locations within the chamber of interest.
- At procedure end, prior to removal of catheters. Replicate catheter location(s) used previously.
- At any point during the procedure where an instance of instability might have occurred. Replicate catheter location(s) used previously.

The anonymized images should be uploaded using following naming convention:

- SiteID_PatientID_Fluoro Procedure Start
- SiteID_PatientID_Fluoro Procedure End
- SiteID_PatientID_Fluoro Procedure Instance of Instability

(in case of multiple possible instances, please number them accordingly)

Please refer to the Procedure Guidelines (provided in a separate document) for more detailed information.

Concerning additional data collection, please refer to the procedure guidelines. These guidelines are not mandatory, however, they may assist in current knowledge and understanding of the treatment options for patients with arrhythmias.

The entire study (EPS) should be backed up on a USB drive (provided by sponsor) and returned to the sponsor within reasonable timelines. Please refer to the Procedure Guidelines for additional information.

The User Experience Form should be completed once by every physician performing a procedure for this registry.

NOTE: The EnSite Precision™ System interfaces to either the MediGuide™ Guided Medical Positioning System or the EnSite Precision™ Module to combine and display magnetic processed patient positioning and orientation mapping information. In order to use these features, the Electrophysiologist (EP) will need to use at least one sensor enabled (SE) catheter (e.g, Advisor™ FL Circular Mapping Catheter, Sensor Enabled™ or FlexAbility™ SE Ablation Catheter) in the area or chamber of interest. Physicians or hospitals that wish to use the system without an SE catheter may do so, however the use of an SE catheter is strongly encouraged in order to take full advantage of system features.

NOTE: The EnSite™ AutoMap™ Module is a software entitlement feature within the EnSite Cardiac Mapping System. AutoMap automates the point collection process, based on the user-defined settings. As the catheter is moved, points are collected when the user-defined settings are met.

NOTE: The AutoMark feature provides the capability to visualize ablation parameter data and contact force data at the catheter tip on the EnSite Precision™ Cardiac Mapping System display. The EP can configure the software to display generator data including time, duration, power temperature and catheter dwell time.

NOTE: Any adverse event (refer to section 7.0 for details) and/or protocol deviations (refer to section 6.2 for details) at the procedure will also be recorded at this time.

5.6 Pre-Discharge (within 7 days post Procedure)

The pre-discharge visit needs to be performed within 7 days post procedure.

The activities and data collected at pre-discharge include the following:

- Physical examination – Blood pressure
- 12-lead ECG measurement
- Medication – indicate any changes in anticoagulant medication
- Any reportable adverse event that might have occurred since the procedure
- Any deviation that might have occurred

5.7 Description of Activities performed by Sponsor Representatives

Trained sponsor personnel may perform certain activities to ensure compliance to the clinical investigational plan and may provide technical expertise.

Sponsor personnel will not:

- Administer the informed consent process
- Practice medicine
- Provide medical diagnosis or treatment to subjects
- Discuss a subject's condition or treatment with a subject without the approval and presence of a health care practitioner
- Independently collect registry data

5.8 Subject Registry Completion

When the subject's participation in the registry has been completed, i.e. after the pre-discharge visit, the subject will return to medical care as per physician's recommendation.

5.9 Any known or foreseeable Factors that may compromise the Outcome of the Registry or the Interpretation of the Results

All foreseeable factors that may compromise the outcome have been taken into account

- Recruitment plans
- Enrollment of an insufficient variety of arrhythmias which might result in a prolonged and extended enrollment period
- Enrollment targets

5.10 Description of the Methods that will be used to address potentially confounding Factors in the Design

Methods used to address potentially confounding factors are:

- Ensure a variety of EP cases by introducing a screening tool that will facilitate patient inclusion based on arrhythmia history.

5.11 Criteria and Procedures for Subject Withdrawal or Discontinuation

Subjects must be informed about their right to withdraw from the registry at any time and for any reason without sanction, penalty or loss of benefits to which the subject is otherwise entitled and withdrawal from the registry will not jeopardize their future medical care or relationship with the investigator. Subjects will be asked to specify the reason for the Withdrawal, but have the right not to answer.

The investigator may decide to withdraw a subject from the registry at any time with reasonable rationale. The subject's future care will not be influenced by a decision, voluntary or otherwise, to withdraw from the registry. All reasonable efforts should be made to retain the subject in the registry until completion of the registry.

Any withdrawal prior to the procedure (for any reason), should only be documented on a Withdrawal Form.

Reasons for subject's withdrawal include, but are not limited to:

- Subject refuses to continue participation in the registry
- Subject is deceased (cause must be documented)
- Subject's non-compliance
- Subject is 'lost to follow up': Subject does not adhere to the scheduled follow up visits but has not explicitly requested to be withdrawn from the registry. (This does not apply to missed visits). Site personnel should at all times make all reasonable efforts to locate and communicate with the subject in order to achieve subject compliance to the scheduled follow up visits:
  1. A subject will be considered 'Lost to Follow Up' after a minimum of 2 phone calls of a physician or delegate at the site to the subject or contact. These 2 phone calls need to be documented in the subject's hospital records.
  2. If these attempts are unsuccessful, a letter should be sent to the subject's last known address or general practitioner (GP) and a copy of this letter should be maintained in the subject's hospital records.

If a subject withdraws from the registry, the site will record the subject's reasons for withdrawal, on a Withdrawal Case Report Form (CRF).

6.0 COMPLIANCE TO CIP

6.1 Statement of Compliance

The registry will be performed in accordance with the most current versions of the World Medical Association (WMA) Declaration of Helsinki, ISO14155 and any regional and/or national regulations and will be compliant to this International Standard and any regional and national regulations, as appropriate.

The investigator will not start enrolling subjects or requesting informed consent from any subject prior to obtaining EC/IRB approval, if applicable, and authorization from the sponsor in writing for the registry.

In the case that additional requirements are imposed by the EC/IRB, those requirements will be followed, if appropriate. If any action is taken by an EC/IRB, and regulatory requirements with respect to the registry, that information will be forwarded to St. Jude Medical.

As sponsor, St. Jude Medical has taken up general liability insurance in accordance with the requirements of the applicable local laws. Appropriate country representatives will be utilized to understand the requirements for the type of insurance that will be provided for subjects, such information will be incorporated into the informed consent, as applicable

If required, additional subject coverage or a registry specific insurance will be provided by the Sponsor as well.

6.2 Adherence to the Clinical Investigational Plan

A deviation is defined as an event where the clinical investigator, site personnel, sponsor or sponsor representative did not conduct the registry according to the Clinical Investigational Plan, EC/IRB requirements or the Investigator Agreement. The investigator is not allowed to deviate from the CIP, except as specified under emergency circumstances.

In some cases, failure to comply with the CIP may be considered failure to protect the rights, safety and well-being of subjects, since the non-compliance exposes subjects to unreasonable risks. For example, failure to adhere to the inclusion/exclusion criteria: these criteria are specifically defined by the Sponsor to exclude subjects for whom the device is not beneficial and the use involves unreasonable risks. This may be considered failure to protect the rights, safety and well-being of the enrolled subject. Similarly, failure to perform safety assessments intended to detect adverse events may be considered failure to protect the rights, safety and well-being of the enrolled subject. Investigators should seek minimization of such risks by adhering to the CIP.

Simultaneously, in the event that adhering to the CIP might expose the subject to unreasonable risks, the investigator is also required to protect the rights, safety and well-being of the subject by intentionally deviating from the requirements of the CIP, so that subjects are not exposed to unreasonable risks.

It is the responsibility of the investigator to provide adequate medical care to a subject enrolled in a registry.

Regulations require that the PI maintain accurate, complete, and current records, including documents showing the date of and reason for every deviation from the Clinical Investigational Plan. Relevant information for each deviation will be documented on a Deviation Case Report Form. The site will submit the CRF to St. Jude Medical.

Regulations require Investigators obtain approval from St. Jude Medical and the EC/IRB (as required) before initiating changes in or deviations from the protocol, except when necessary to protect the life or physical well-being of a subject in an emergency. Under emergency circumstances, deviations from the CIP to protect the rights, safety and well-being of human subjects may proceed without prior approval of the sponsor and the EC/IRB. Such deviations shall be documented and reported to the sponsor and the ECIRB as soon as possible, but no later than 5 working days.

Prior approval must be requested when the PI anticipates, contemplates, or makes a conscious decision to depart from the CIP, except when unforeseen circumstances are beyond the investigator's control (e.g. a subject who fails to attend a scheduled follow-up visit, a subject is too ill to perform a CIP-required test, etc.). All deviations, including those beyond the investigator's control, must be reported on a CRF.

To obtain approval, the Principal Investigator may call or email and discuss the potential deviation with St. Jude Medical or designee prior to initiating any changes.

All deviations must be reported to appropriate regulatory authorities in specified timelines (if appropriate).

Investigators or the designee must notify St. Jude Medical, Inc. as soon as possible and complete the Deviation CRF.

The Investigator is required to adhere to local regulatory requirements for reporting deviations to EC/IRB.

6.3 Repeated and serious Non-Compliance

In the event of repeated non-compliance or a one-time serious non-compliance, as determined by the Sponsor, a Clinical Research Associate or clinical representative will attempt to secure compliance by one or more of the following actions:

- Visiting the investigator
- Contacting the investigator by telephone
- Contacting the investigator in writing
- Retraining of the investigator

If an investigator is found to be repeatedly non-compliant with the signed agreement, the CIP or any other conditions of the registry, the Sponsor will either secure compliance or, at its sole discretion, terminate the investigator's participation in the registry.

7.0 ADVERSE EVENT, ADVERSE DEVICE EFFECT

7.1 Definitions

7.1.1 Medical device

Any instrument, apparatus, implement, machine, appliance, implant, software, material or other similar or related article

- Intended by the manufacturer to be used, alone or in combination, for human beings for one or more of the specific purpose(s) of
  - Diagnosis, prevention, monitoring, treatments or alleviation of disease,
  - Diagnosis, monitoring, treatment, alleviation of, or compensation for, an injury,

- Investigation, replacement, modification, or support of the anatomy or of a physiological process,
- Supporting or sustaining life,
- Control of conception,
- Disinfection of medical devices and

- Which does not achieve its primary intended action in or on the human body by pharmacological, immunological or metabolic means, but which may be assisted in its intended function by such means

7.1.2 Adverse Event (AE)

Any untoward medical occurrence, unintended disease or injury, or untoward clinical signs (including abnormal laboratory findings) in subjects, users or other persons, whether or not related to the investigational medical device under study.

This definition includes events related to the investigational medical device or the comparator.
This definition includes events related to the procedures involved.

7.1.3 Serious Adverse Event (SAE)

An adverse event that led to:

- Death
- A serious deterioration in the health of the subject, that either resulted in:
  - A life-threatening illness or injury OR
  - A permanent impairment to a body structure or a body function OR
  - An in-patient or prolonged hospitalization OR
  - A medical or surgical intervention to prevent life-threatening illness or injury or permanent impairment to a body structure or a body OR
  - A malignant tumor
- Fetal distress, fetal death or a congenital abnormality or birth defect

A planned hospitalization for a pre-existing condition, or a procedure required by the CIP is not considered a serious adverse event.

7.1.4 Adverse Device Effect (ADE)

An adverse event related to the use of an investigational medical device.

This definition includes adverse events resulting from insufficient or inadequate instructions for use, deployment, implantation, installation, or operation, or any malfunction of the investigational medical device.

This definition includes any event resulting from the use error or from intentional misuse of the investigational medical device.

7.1.5 Serious Adverse Device Effect (SADE)

Adverse device effect that has resulted in any of the consequences characteristic of a serious adverse event.

7.2 Procedure for Assessing, Recording and Reporting Adverse Events, Complaints, Adverse Device Effects, Serious Adverse Events and Serious Adverse Device Effects

Safety surveillance within this registry and the safety reporting, both performed by the investigator, starts at the Procedure Visit and will continue until the last visit has been performed, the subject is deceased, the subject/investigator concludes his participation into the registry or the subject/investigator withdraws the subject from the registry, except as otherwise specified in the CIP.

For the purpose of this registry, all Serious Adverse Events (regardless of relatedness) and all Adverse Device Effects (regardless of severity) will be documented and reported via an eCRF to the sponsor immediately but no later than 72 hours after becoming aware of the event.

All complaints for SJM products must be reported to SJM Post Market Surveillance. The investigator should notify their SJM representative **or** SJM Postmarket Surveillance Department as soon as possible after becoming aware of a complaint by email to AF_ProductSurveillance@sjm.com or calling +16517565400.

Device related and/or procedure related events/complaints will be further assessed by SJM within SJM Postmarket Surveillance system.

Records relating to the subject's subsequent medical course must be maintained and submitted (as applicable) to the Sponsor until the event has subsided or, in case of permanent impairment, until the event stabilizes and the overall clinical outcome has been ascertained. Adverse events will be monitored until they are adequately resolved. The status of the subject's condition should be documented at each visit.

Subjects will be carefully monitored during the registry for possible required AEs. Any reportable AE will be followed to a satisfactory resolution, until it becomes stable, or until it can be explained by another known cause(s) (i.e., concurrent condition or medication) and clinical judgment indicates that further evaluation is not warranted. All findings relevant to the final outcome of an AE must be reported in the patient's medical record.

The clinical investigator will attempt to assess the involvement of the procedure and device in the AE. All observations and clinical findings, including the nature, severity, and relationship, will be documented on the appropriate eCRFs.

Adverse events will be assessed by the investigator for relationship to the device and to the procedures involved.

- **Procedure related:** The AE is deemed related to the procedure if it occurred during the procedure but was not directly caused by the medical device.
- **Device related**: The AE is deemed device related if it was directly caused by the medical device

The Sponsor will ensure that all events are reported to the relevant authorities as per regulations.

The investigator must notify the EC/IRB, if appropriate, in accordance with national and local laws and regulations, of the AEs reported to the Sponsor.

Additional information may be requested, when required, by the Sponsor in order to support the reporting of AEs to regulatory authorities.

7.2.1 Anticipated Adverse Events and Adverse Device Effects

The following complications have been reported for other commercially available Cardiac Mapping Systems (and competitive systems) and are expected to be similar to those anticipated in this registry. Possible anticipated adverse events are including, but not limited to:

- Map shifts without warning or error message
- Complete signal loss of one or more channels
- Pacing malfunction
- Incorrect catheter display
- System freeze/Slow processing
- Electrical shock
- Signal interference
- System shutdown
- Signals duplicated on two separate channels
- Perforation
- Significant signal noise
- Miscellaneous error requiring procedure cancellation
- Loss of data display
- Pacing routed through wrong channel
- Unwanted pacing initiated by the system
- Metal interface
- Bent pins on output cable
- Allergic reaction – Patches
- Temperature too low for ablation
- PIU overheating

The following complications have been reported for commercially available catheters or in published literature and are expected to be similar to those anticipated in this registry. Possible anticipated adverse events are any events associated with any EP procedure including, but not limited to:

- Transient Ischemic Attack (TIA)
- Coronary Sinus dissection or perforation
- Valve damage
- Thrombolic or air embolism
- Hemothorax
- Pericardial effusion
- Unintended complete or incomplete AV, SN or other heart block
- Venous thrombosis
- Endocarditis
- Local tissue reaction
- Death (is result of AE)
- Possible allergic reaction to conscious anesthetic sedation medication or short term exposure to heparin
- Cardiac damage
- Tamponade
- Induced atrial or ventricular arrhythmias
- Pneumothorax
- Myocardial irritability/infarction
- Pleural effusion
- CHF exacerbation or pulmonary edema
- Excessive bleeding
- Infection
- Formation of fibrotic tissue
- Hematoma/seroma
- Vascular perforation or dissection
- Catheter entrapment within the heart or blood vessels
- Atrio-esophageal fistula

These AEs are not unique to catheters being used within the registry and could occur as a result of any EP procedure outside of the registry.

Anticipated non cardiac events are, but not limited to:

- Air embolism
- Cerebral Vascular Accident (CVA)
- Laceration
- Pneumonia
- Pulmonary hypertension
- Respiratory depression
- Anesthesia reaction
- High creatinine phosphokinase
- Phrenic nerve damage
- Pulmonary embolism
- Pseudo-aneurysm
- Sepsis

- Skin burns
- Vasovagal reaction
- Increased risk for somatic and genetic effects
- Syncope
- Acute radiation injury

7.3 Subject Death

7.3.1 Procedure for recording and reporting subject death

Safety surveillance within this registry and the safety reporting, both performed by the investigator, starts at the procedure visit.

In case of a subject death prior to the procedure visit:
- Document the death and any relevant information in the medical records
- Complete a Withdrawal form

All subject deaths (from the time of the Procedure Visit) are to be documented and reported to the sponsor within 72 hours after becoming aware of the event.

Should death occur, the investigator is requested to record death information in the hospital records and immediately document the information on the Death form. By completing the form, the sponsor will be notified.

Patient death is an outcome of a serious adverse event (SAE).
- Death is therefore related to an SAE: all efforts to obtain SAE details should be made and the Adverse Event form must be completed
- The patient's death is an early conclusion of the subject's participation in the registry. Therefore, the investigator is requested to complete the Withdrawal Form.
- The investigator must notify the EC/IRB, if appropriate, in accordance with national and local laws and regulations.

8.0 RISKS AND BENEFITS OF THE REGISTRY

8.1 Description of Subject Population

Up to 500 subjects undergoing EP procedures at centers equipped with EnSite Precision™ Cardiac Mapping System and EnSite Precision™ Software v2.0 will participate in this registry.

8.2 Anticipated Clinical Benefits

The aim of this registry is to collect information on the use and the performance of the EnSite Precision™ Cardiac Mapping System V2.0.

The information collected in this registry will be added to the current knowledge and understanding of treatment options for patients with arrhythmias. Subjects participating in this registry are not expected to experience any additional benefit or harm compared to patients who are not participating in this registry as the registry will follow local standard practice.

8.3 Residual Risks associated with the Device under investigation, as defined in the Risk Analyses Report

The residual risk evaluated in the risk analyses/evaluation documents has been judged acceptable using the criteria defined in the Risk Management Plan and the sponsor's internal policies. The data

obtained and reported in the Risk Management Report, provides sufficient evidence that the EnSite Precision™ Cardiac Mapping System is safe and effective for its intended use.
While steps have been taken to identify risks associated with the system and participation in the registry, there may be risks that are unknown at this time.

8.4 Risks associated with participation in the Registry

Risks to subjects enrolled in this registry include all those risks currently associated with all other commercially available electrophysiology diagnostic procedures and RF catheter ablation procedures. The risks of the procedure are related primarily to mechanical injury to the heart and vessels from catheter manipulation and thermal injury due to RF current delivery, including the risk of thromboembolism and myocardial perforation, especially for ablations in the left atrium.

For those procedures where the physician applies sedation or anesthesia, the standard risks of anesthesia also exist and include allergic reactions, pneumonia, aspiration pneumonitis, atelectasis, prolonged sedation, other medical complications and in very rare cases, death.

This registry does not impose any registry specific procedures, thus does not increase the risk of participating.

8.5 Possible Interactions with concomitant medical Treatments and/or concurrent Medical Interventions

There are no interactions with concomitant medical treatments and/or concurrent medical interventions compared to standard practice.

8.6 Steps that will be taken to control or mitigate the Risks

Every possible effort will be taken to minimize the risks, including:

- Careful selection of experienced investigators who have experience with EnSite Precision™ V2.0 Cardiac Mapping System and study teams for the registry
- Conduction of the ablation procedures in accordance with the IFU of the corresponding devices

8.7 Risk-to-Benefit Rationale

The catheter ablation is a recognized safe and effective treatment of cardiac arrhythmias. The EnSite Precision™ Cardiac Mapping System is believed to not introduce any unanticipated risks compared to current practice, thus benefits outweigh the risks.

9.0 DATA MANAGEMENT

Overall, the Sponsor will be responsible for the data handling.

The sponsor and/or its affiliates will be responsible for compiling and submitting all required reports to governmental agencies.

Data will be analyzed by the Sponsor and may be transferred to the Sponsor's locations outside of Europe and/or any other worldwide regulatory authority in support of a market-approval application.

St. Jude Medical respects and protects personally identifiable information collected or maintained for this clinical trial. The privacy of each subject and confidentiality of his/her information will be preserved

in reports and when publishing any data. Confidentiality of data will be observed by all parties involved at all times throughout the clinical trial. All data will be secured against unauthorized access.

All documents and data will be produced and maintained in a way that assures control and traceability. Where relevant, the accuracy of translations will be guaranteed and documented. All documents, and subsequent versions, related to a clinical investigation will be identifiable, traceable and appropriately stored to provide a complete history of the clinical investigation.
The case report forms will be developed by the Sponsor to capture the data for each subject as required by the CIP. The case report forms will include information on the condition of each subject upon entering, and during the course of, the clinical investigation, exposure to the investigational medical device and any other therapies.

The Principal Investigator or institution will provide direct access to source data during and after the registry for monitoring, audits, EC/IRB review and regulatory authority inspections. As required, the Principal Investigator or institution will obtain permission for direct access to source documents from the subject, hospital administration and national regulatory authorities before starting the registry.

9.1 Data Management Plan (DMP)

A detailed Data Management Plan will be established to ensure consistency of the data. This document will include procedures used for data review, database cleaning, and issuing and resolving data queries. If appropriate, the DMP may be updated throughout the registry duration. All revisions will be tracked and document controlled.

CRF data will be captured in a validated electronic database management system hosted by St. Jude Medical.

Only authorized site personnel will be permitted to enter the CRF data through the electronic data capture (EDC) system deployed by St. Jude Medical. An electronic audit trail will be used to track any subsequent changes of the entered data.

9.2 Document Control and Data Control

9.2.1 Traceability of documents and data

The investigator will ensure accuracy, completeness, legibility and timeliness of the data reported to the sponsor on the CRFs and in all required reports.

9.2.2 Recording data

Source documents will be created and maintained by the investigational site team throughout the registry.
A source document corresponds to the printed, optical or electronic document containing the source data, such as: all clinical records, hospital records, laboratory notes, surgery reports, and any other records that contain the original information of the data required in the registry and in the corresponding adverse event reporting, if any.
To facilitate data collection during the EP procedure, worksheets may be provided to the site where source data can be collected.

The data reported on the CRFs will be derived from, and be consistent with, these source documents, and any discrepancies will be explained in writing.

The CRFs will be validated (eCRF) by the authorized site personnel. An audit trail will be maintained for all corrections.

10.0 MONITORING

Centralized monitoring will occur through routine internal data review. This monitoring is designed to identify missing and inconsistent data, data outliers, and potential protocol deviations that may be indicative of site non-compliance. On-site monitoring may occur at the discretion of the sponsor.

11.0 REGULATORY INSPECTIONS

The investigator and/or delegate should contact St. Jude Medical immediately upon notification of a governmental agency inspection at the site. A clinical monitor or designee will assist the investigator and/or delegate in preparing for the audit.

An investigator who has authority to grant access will permit authorized governmental agency employees, at reasonable times and in reasonable manner, to enter and inspect any establishment where devices are held (including any establishment where devices are used or where records or results are kept).

An investigator, or any person acting on behalf of such a person with respect to the registry, will permit authorized governmental agency employees, at reasonable times and in reasonable manner, to inspect and copy all records relating to the registry.

An investigator will permit authorized governmental agency employees to inspect and copy records that identify subjects, upon notice that governmental agency has reason to suspect that adequate informed consent was not obtained, or that reports required to be submitted by the investigator, to the Sponsor or EC/IRB have not been submitted or are incomplete, inaccurate, false or misleading.

12.0 STATISTICAL CONSIDERATIONS

12.1 Statistical Design, Hypotheses, Method and Analytical Procedures

This is a multi-center, observational, prospective registry. The objective of the registry is to assess and characterize the use and performance of the EnSite Precision™ Cardiac Mapping System and EnSite Precision™ Software v2.0 (The System) in a variety of electrophysiological (EP) procedures and clinical settings.

The endpoints for characterizing and evaluating the objective are as following:

Primary Endpoints:

- EnSite Precision™ Software v2.0 Assessment
  - Accuracy of geometry: Proportion of subjects with accurate geometry
  - Overall system stability: Proportion of subjects with overall system stability
  - Unrecoverable shifts: Proportion of subjects whose map could not be recovered

- Automap™ Module Assessment
  - Mapping time associated with (re-)mapping one or multiple arrhythmias in a single subject with a variety of catheters; mapping time will be summarized (using mean, median, standard deviation, minimum and maximum across arrhythmia types, and for each type of arrhythmia as appropriate) for the following modules:
    - Manual
    - AutoMap™
    - TurboMap™
  - Point density associated with (re-)mapping one or multiple arrhythmias in a single subject with a variety of catheters; mapping points collected and used will be summarized (using mean, median, standard deviation, minimum and maximum across arrhythmia types, and for each type of arrhythmia as appropriate)

Secondary Endpoints:

- EnSite Precision™ Cardiac Mapping System Assessment
  - Ease of Use: Proportion of subjects in whom the mapping system was reported to be excellent, very good, good, poor and N/A
  - Overall Procedure time: will be summarized using mean, median, standard deviation, minimum and maximum

- AutoMark feature Assessment
  - Clinical Utility of the automated RF marker placement: proportion of subjects where the AutoMark feature assisted in identifying gaps in lesion lines
  - Ease of Use of the automated RF marker placement: proportion of subjects where the AutoMark feature was easy to use

Analysis method:

The analysis population will include subjects who have signed the Informed Consent Form and undergone the CIP defined EP study and ablation procedure. Endpoints will be summarized based on available data or measurements in the analysis population, as appropriate.

Data will be categorized and summarized using appropriate descriptive statistics. Continuous data will be summarized using descriptive statistics such as the number of non-missing data, mean, standard deviation and/or median, minimum, or maximum. Categorical data will be summarized using frequency count and its percentage.

12.2 Sample Size

It is estimated that ventricular tachycardias would occur at a rate of 10%. The study will characterize mapping time and point density for a minimum of 50 subjects with each type of arrhythmia. Since Ventricular Tachycardia is expected to occur at the lowest rate (10%), up to 500 subjects will be enrolled in this registry.

12.3 Pass/Fail Criteria to be applied to the Results of the Registry

The purpose of this registry is to characterize data collected in the population indicated for a cardiac EP study and/or ablation procedure using a 3D mapping system.

Pass/Fail criteria do not apply to this study.

12.4 The Provision for Interim Analyses

There are no interim analyses planned for this registry.

12.5 Criteria for the Termination of the Registry on statistical Grounds

There are no pre-specified criteria for terminating this registry on statistical grounds.

12.6 Procedures for reporting any Deviation(s) from the original Statistical Plan

Deviations from the statistical plan described in this CIP, if any, will be documented in the report summarizing the results.

12.7 The Specification of Subgroups for Analyses

There are no pre-specified subgroup analysis for this registry, however, data may be summarized/reported by center and by gender if appropriate.

12.8 Procedures that take into account all the Data

All subjects who have signed the consent of this registry will be considered enrolled in the study and are eligible for the data summary and analysis. The analysis population will include subjects who have signed the consent form and undergone the CIP defined EP and ablation procedure.

12.9 The Treatment of missing, unused or spurious Data, including Drop-outs and Withdrawals

All data available for the endpoints specified among the analysis population will be used as appropriate. No imputation will be used treat missing data.

12.10 The Exclusion or particular Information for the testing of the hypothesis

Not applicable as hypothesis testing will not be performed.

12.11 The minimum and maximum Number of Subjects to be included for each Center

It is expected to enroll up to 500 subjects in up to 50 centers worldwide. The maximum number of subjects to be included at each enrolling center is 75 (15% of total enrollment) subjects, in an effort to have a balance of the subjects across participating centers. The minimum number of subjects to be included at enrolling centers is 1.

13.0 DOCUMENT RETENTION

The principal investigator (PI) will maintain all registry documents from prior, during and (as specified) after the registry on file at the site for a minimum of 2 years after the termination of this registry, or longer as per local laws, or when it is no longer needed to support a marketing application, whichever is later.

The PI must contact the sponsor prior to destroying or archiving off-site any records and reports pertaining to this registry to ensure that they no longer need to be retained on-site.

All original subject files must be stored for the longest possible time permitted by the regulations at the hospital, research institute, or practice in question. If archiving can no longer be maintained at the site, the investigator will notify the sponsor.

All data and documents will be made available on request of the relevant authorities in case of an audit.

The sponsor will archive and retain all essential registry documents from prior, during and (as specified) after the registry as per requirements.

14.0 AMENDMENTS TO CLINICAL INVESTIGATIONAL PLAN

Registry related documents such as the protocol, CRFs, the Informed Consent Form and other subject information, or other registry documents will be amended as needed throughout the registry, and a justification statement will be included with each amended section of a document. Proposed amendments to the CIP will be agreed upon between the Sponsor and the coordinating investigator (if applicable).

The amendments to the CIP and the subject's Informed Consent will be notified to, or approved by, the EC/IRB and regulatory authorities, if required. The version number and date of amendments will be documented.

The amendment will identify the changes made, the reason for the changes and if it is mandatory or optional to implement the amendment.

Any amendment affecting the subject requires that the subject be informed of the changes and a new consent be signed and dated by the investigator at the subject's next follow up.

Changes to, or formal clarifications of, the CIP will be documented in writing and provided to the investigators. This information will be incorporated when an amendment occurs.

15.0 STUDY COMMITTEES

No study committees will be set up for this registry.

16.0 REGISTRY SUSPENSION OR TERMINATION

16.1 Premature Termination of the whole Registry or of the Registry in one or more sites

The Sponsor reserves the right to stop the registry at any stage, with appropriate written notice to the investigator.

Possible reasons for early termination of the registry by the sponsor, either at local, national or international level, may include, but are not limited to:

- The device / therapy fails to perform as intended
- Occurrence of USADE which cannot be prevented in future cases
- Sponsor's decision
- Request from Regulatory bodies
- Request of Ethics Committee(s)
- Concern for subject safety and welfare
- Failure to secure subject Informed Consent prior to any registry specific activity
- Failure to report unanticipated adverse device effects within 72 hours to St. Jude Medical and the EC/IRB
- Repeated non-compliance with this CIP or the Clinical Trial Agreement
- Inability to successfully implement this CIP
- Violation of the Declaration of Helsinki 2008 (refer to Appendix C)
- Violation of applicable national or local laws and regulations
- Falsification of data, or any other breach of ethics or scientific principles
- Loss of or unaccounted use of investigational device inventory

The registry will be terminated according to applicable regulations.

The investigator may also discontinue participation in the registry with appropriate written notice to the Sponsor.

Should either of these events occur, the investigator will return all documents to the sponsor; provide a written statement as to why the premature termination has taken place and notify the EC/IRB and/or the Competent Authority (if applicable). Follow-up for all enrolled subjects will be as per CIP requirements.

A Principal Investigator, EC/IRB or regulatory authority may suspend or prematurely terminate participation in a registry at the sites for which they are responsible.

If suspicion of an unacceptable risk to subjects arises during the registry or when so instructed by the EC/IRB or regulatory authority, St. Jude Medical may suspend the registry as appropriate while the risk is assessed. St. Jude Medical will terminate the registry if an unacceptable risk is confirmed.

St. Jude Medical will consider terminating or suspending the participation of a particular site or investigator in the registry if monitoring or auditing identifies serious or repeated deviations on the part of an investigator.

If suspension or premature termination occurs, the terminating party will justify its decision in writing and promptly inform the other parties with whom they are in direct communication. The Principal Investigator and St. Jude Medical will keep each other informed of any communication received from EC/IRB or regulatory authority.

If for any reason St. Jude Medical suspends or prematurely terminates the registry at an individual site, St. Jude Medical will inform the responsible regulatory authority, as appropriate, and ensure that the EC/IRB are notified, either by the Principal Investigator or by St. Jude Medical. If the suspension or premature termination was in the interest of safety, St. Jude Medical will inform all other Principal Investigators.

If suspension or premature termination occurs, St. Jude Medical will remain responsible for providing resources to fulfill the obligations from the CIP and existing agreements for following up the subjects enrolled in the registry, and the Principal Investigator or authorized designee will promptly inform the enrolled subjects at his/her site, if appropriate.

16.2 Resuming the Registry after temporary Suspension

When St. Jude Medical concludes an analysis of the reasons for the suspension, implements the necessary corrective actions, and decides to lift the temporary suspension, St. Jude Medical will inform the Principal Investigators, EC/IRB, or regulatory authority, where appropriate, of the rationale, providing them with the relevant data supporting this decision.

Concurrence will be obtained before the registry resumes from the EC/IRB or regulatory authority where appropriate.

If subjects have been informed of the suspension, the Principal Investigator or authorized designee will inform them of the reasons for resumption.

16.3 Registry Conclusion

The registry will be concluded when:

- All sites are closed AND
- The Final report generated by St. Jude Medical has been provided to sites or St. Jude Medical has provided formal documentation of registry closure

17.0 PUBLICATION POLICY

The results of the registry will be submitted for publication, regardless of the outcome.

A ‘Publication Agreement’ will be signed between the Principal Investigator and the Sponsor either as a separate Publication Agreement or within the Clinical Trial Agreement.

The International Committee of Medical Journal Editors (ICMJE) guidelines on www.icmje.org will be followed.

This registry will be posted on ClinicalTrials.gov and results will be posted on ClinicalTrials.gov as required.

18.0 BIBLIOGRAPHY

[1] M. Zoni-Berisso, F. Lercari, T. Carazza and S. Domenicucci, "Epidemiology of Atrial Fibrillation: European Perspective," *Clinical Epidemiology,* no. 213-220, pp. 771-817, 2014.

[2] S. Themistoclakis, A. Raviele, P. China, C. Pappone, R. De Ponti, A. Revishvili, E. Aliot, K.-H. Kuck, P. I. Hoff, D. Shah, J. Almendral, A. S. Manolis, G.-B. Chierchia, A. Oto, R. G. Vatasescu, M. Sinkovec and R. Cappato, "Prospective European Survey on Atrial Fibrillation Ablation: Clinical Characteristics on Patients and Ablation Strategies Used in Different Countries," *J Cardiovasc Electrophysiol,* pp. 1074-1081.

[3] H. Calkins, K.-. H. Kuck, J. Brugada, A. J. Camm, S.-A. Chen, H. C. J. Crijns, R. J. Damiano Jr, D. W. Davies, J. DiMarco, J. Edgerton, K. Ellenbogen, M. D. Ezekowitz, D. E. Haines, M. Haissaguerre, G. Hindricks, Y. Iesaka, W. Jachman, J. Jalife, P. Jais, J. Kalman, D. Keane, Y.-H. Kim, P. Kirchhof, G. Klein, H. Kottkamp, K. Kumagai, B. D. Lindsay, M. Mansour, F. E. Marchlinski, P. M. McCarthy, J. L. Mony, F. Morady, K. Nademanee, H. Nakagawa, A. Natale, S. Nattel, D. L. Packer, C. Pappone, E. Prystowsky, A. Raviele, V. Reddy, J. N. Ruskin, R. Shemin, M.-M. Tsao and D. Wilber, "2012 HRS/EHRA/ECAS Expert Consensus Statement on Catheter and Surgical Ablation of Atrial Fibrillation: Recommendations for Patient Selection, Procedural Techniques, Patient Management and Follow-up, Definitions, Endpoints and Research Trial Design," *Europace,* pp. 528-606, 2012.

[4] R. Deo and C. M. Albert, "Epidemiology and Genetics of Sudden Cardiac Death," *Circulation,* pp. 620-637, 2012.

[5] R. Tung, N. G. Boyle and K. Shivkumar, "Catheter Ablation of Ventricular Tachycardia," *Circulation,* vol. 122, pp. 389-391, 2010.

[6] E. M. Aliot, W. G. Stevenson, J. Ma Almendral-Garrote, F. Bogun, C. H. Calkins, E. Delacretaz, P. Della Bella, G. Hindricks, P. Jaïs, M. E. Josephson, J. Kautzner, G. N. Kay, K.-H. Kuck, B. B. Lerman, F. Marchlinski, V. Reddy, M.-J. Schalij, R. Schilling, K. Soejima and D. Wilber, "EHRA/HRS Expert Consensus on Catheter Ablation of Ventricular Arrhythmias," *Europace,* pp. 771-817, 2009.

APPENDIX A: ABBREVIATIONS

Abbreviation	Term
ADE	Adverse Device Effect
AE	Adverse Event
AF	Atrial Fibrillation
ANZ	Australia – New Zealand
ASADE	Anticipated Serious Adverse Device Effect
AT	Atrial Tachycardia
CA	Competent Authority
CE	Conformité Européenne
CIP	Clinical Investigational Plan
CRF	Case Report Form
CPRB	Clinical Project Review Board
CVA	Cerebral Vascular Accident
DMP	Data Management Plan
EC	Ethics Committee
ECG	Electrocardiogram
eCRF	Electronic Case Report Form
EDC	Electronic Data Capture
EMEA	Europe, Middle East, Africa
EP	Electrophysiology/Electrophysiologist
EPS	Electrophysiology study
GP	General Practitioner
IB	Investigator Brochure
ICD	Implantable Cardioverter Defibrillator
ICMJE	International Committee of Medical Journal Editors
IFU	Instructions for Use
IRB	Institutional Review Board
ISO	International Organization for Standardization
NA	Not Applicable
NYHA	New York Health Association
PI	Principal Investigator
RDC	Remote Data Capture
RF	Radio Frequency
SADE	Serious Adverse Device Effect
SAE	Serious Adverse Event
SJM	St. Jude Medical
TIA	Transient Ischemic Attack
VF	Ventricular Fibrillation
VT	Ventricular Tachycardia
WMA	World Medical Association

APPENDIX B: CIP REVISION HISTORY

Revision History				
Amendment Number	Version	Date	Rationale	Details
Not Applicable	A	11MAR2016	First release of CIP	NA

Appendix C: DECLARATION OF HELSINKI

The most current version of the document will be followed.

Appendix D: GUIDELINES (registry specific)

Procedure guidelines will be kept under a separate cover and are available upon request.

Appendix E: LIST OF SITES AND ECs/IRBs

A list of sites and ECs/IRBs will be kept under a separate cover and is available upon request.

Appendix F: SAMPLE INFORMED CONSENT

REGISTRY TITLE AND NUMBER	***EnSite Precision™ V2.0 Registry – SJM-CIP-10111***
SPONSOR	***St. Jude Medical, Inc.***
PRINCIPAL INVESTIGATOR	***Name of principal investigator*** ***Address***
SITE NAME	***Institution/Site Name*** ***Address***

Introduction

You are being asked to take part in this registry evaluating the EnSite Precision™ Cardiac Mapping System because your doctor has determined that this diagnostic system in conjunction with the physician selected catheter could be beneficial to you in treating your heart arrhythmia.

Heart rhythm problems (heart arrhythmias) occur when the electrical impulses that coordinate your heartbeats don't work properly, causing your heart to beat too fast, too slow or irregularly.

Heart arrhythmias may feel like a fluttering or racing heart and may be harmless. However, some heart arrhythmias may cause bothersome — sometimes even life-threatening — signs and symptoms.

Catheter ablation is used to treat many types of arrhythmias, such as:

- Atrial arrhythmia, a rapid, and often irregular, heartbeat that begins in the upper chambers of the heart
- Ventricular arrhythmia, a rapid heartbeat that begins in the lower chambers of the heart.

Catheter ablation is performed by an electrophysiologist (EP), a doctor specializing in diagnosing heart rhythm disorders, in a room which is similar to an operating theatre. There will be a team of people present, some of whom you have met before.

It is a minimally invasive procedure, which can be performed using general or conscious sedation. During catheter ablation, catheters (narrow, flexible tubes) are inserted into a blood vessel, often through a site in the groin (upper thigh) or neck, and guided through the vein until they reach the heart. Small electrodes on the tip of the catheters stimulate and record the heart's activity. This test, called an electrophysiology study (EPS), allows the doctor to pinpoint the exact location of the short circuit. Another word for pinpointing the exact location of the short circuit is 'mapping', for which precision is a key requirement to maximize a successful outcome.

Once the location is confirmed, the short circuit is either destroyed (to reopen the electrical pathway) or blocked (to prevent it from sending faulty signals to the rest of the heart). This is done by sending energy through the catheters to destroy a small amount of tissue at the site. This energy is called radiofrequency (RF) energy.

This form explains why this registry is being done and what your role will be if you decide to participate. This form also talks about the possible risks that may happen if you take part in this study. The registry

is sponsored by St. Jude Medical. This company manufactures medical devices intended to treat various medical conditions.

Please read this form, and ask your doctor any questions you may have about the registry so that your questions may be answered before you decide if you want to take part in the registry. Please take your time and talk about this information with your family, friends, or family doctor.

This consent form may contain some words that you do not understand. It is important that you understand what is in this form. It will explain the different activities you will be asked to do or participate if you take part in the registry and what the risks might be; whether or not you do take part is entirely your choice. Please ask the study doctor or the study staff to explain any words or information that you do not understand.

If you decide you want to take part in this registry, you will be asked to sign the consent section before any study-related activities are performed. By signing it you are telling us that you:

- Understand what you have read
- Consent to take part in the registry
- Consent to have the tests and treatments that are described
- Consent to the use of your personal and health information as described.

Taking part in this registry is entirely voluntary. If you don't wish to take part, you don't have to. You will receive the best possible care whether or not you take part in the registry. Refusing participation will not involve any penalty or loss of benefit. If you decide to take part in this registry, you must sign your name at the end of this form. No registry activity can be performed until you sign this form.

What is the purpose of this registry?

Due to the increase in the occurrence of both atrial and ventricular heart rhythm problems, and their complexity (which also influences the duration of the procedures), St. Jude Medical has developed a new system, called the EnSite Precision™ Cardiac Mapping System. This system introduces new and updated features to aid in the successful outcome of ablation procedures. All appropriate approvals, to be market released within ***Europe***, have already been obtained.

The purpose of this registry is to collect information on the performance of the EnSite Precision™ Cardiac Mapping System and the new software in a variety of procedures and clinical settings. In order to evaluate the performance of this new and improved system, the information and data coming from your procedure will be collected and analyzed. Your doctor will treat your heart rhythm disorder as per normal standard practice in your hospital. There will be no change to your acute or long-term treatment and follow up. These tests are part of your normal care and would be done even if you were not in the registry.

What will be requested from you if you take part in this registry?

To take part in this registry, you will have to meet certain criteria. Your doctor will review your medical record to ensure there is nothing in your medical history that would prevent you from taking part in this registry.
At this point, your doctor will discuss this registry with you and your interest in participating. In case you express your interest and willingness to participate, these steps below will be followed.

The clinical investigation consists of 3 main phases.

Phase 1: Enrollment/Baseline visit

Before any registry-related activities are performed, you will be asked to carefully read this information sheet, and if you are willing to participate, sign the consent at the end of this document to confirm your wish to participate.

Following your signature, your doctor or other study personnel will ask you questions related to your current health and medical history. In addition, your height, weight and blood pressure will be measured.

Phase 2: The Ablation Procedure
The procedure will occur within 14 days from the baseline visit.

This procedure will be done according to the standard surgical procedures and standard hospital procedure. During the electrophysiology study (or 'mapping'), your doctor might collect additional information for this registry. However, this will not have an impact on your ablation treatment.

After the procedure, you will be transferred for observation as per standard of care.

Phase 3: The Pre-discharge visit
Within 7 days from the procedure, the following activities will be performed:
- Physical exam – Your blood pressure will be measured
- Electrocardiogram – Electrodes will be put on your skin to record electrical activity from the heart. It will take about 10 minutes.
- Your medication will be documented

After all required information is collected, your participation in this registry will be completed.

How long will the registry last?
If you agree to take part in the registry, your involvement will last maximum 1 month. You will not be asked to return to the hospital for registry purposes. Your doctor will follow up with you as per standard of care.

Up to 500 people will take part in this registry in up to 50 hospitals worldwide.

What are the possible risks and discomforts?
There is no procedure in medicine without risk and catheter ablation is no exception. However, this treatment became standard over the last years because of its very good safety record.
The risks that you would be facing in this registry are common risks associated to any standard ablation. Hence, your participation should not involve additional risks.

The most commonly known risks for any ablation procedure are listed below.
- Bleeding or infection at the site where your catheter was inserted
- Damage to your blood vessels where the catheter may have scraped as it traveled to your heart
- Puncture of your heart
- Damage to your heart valves
- Damage to your heart's electrical system, which could worsen your arrhythmia and require a pacemaker to correct
- Blood clots in the legs or lungs (venous thromboembolism)
- Stroke or heart attack
- Narrowing of the veins that carry blood between your lungs and heart (pulmonary vein stenosis)
- Damage to your kidneys from dye used during the procedure

The mortality risk of catheter ablation is either 1 in 1000 or 1 in 2000 (Heart Rhythm Society) depending on the type of ablation.

During your procedure, you will also be exposed to x-ray radiation because it involves the use of fluoroscopy to guide the cardiac mapping procedures and the catheter ablation procedure. As part of everyday living, everyone is exposed to a small amount of background radiation. Background radiation comes from space and naturally-occurring radioactive minerals. The amount of radiation you are exposed to during the procedure will depend on its complexity but will range from the equivalent of 3 to 12 years of exposure to the natural background radiation to which we are all exposed. The overall risk from this dose is considered small.

There may be some additional discomforts or inconveniences associated with the procedure, which are described below.

Most people do not feel pain during the procedure. In case you doctor chooses for a conscious sedation, you may sense a mild discomfort in your chest when the dye is injected in your catheter or when energy is run through the catheter tip.

After the procedure, you will probably need to lay still a couple of hours to decrease the risk of bleeding. Medical staff may apply pressure to the site where the catheter was inserted which might create some discomfort. Bruising is common. Special machines will be used to monitor your heart as you recover. You may also feel a little sore after your procedure, but the soreness shouldn't last more than a week.

There may be other risks or discomforts to you that are not known at this time. If important information is learned during the course of this registry, your doctor will be notified by St. Jude Medical. Your doctor will discuss with you important new information that is learned during the course of this registry that may affect your condition or willingness to continue to take part in this registry.

What are the risks for women of childbearing age?

If you are a woman who is able to become pregnant, it is expected that you will use an effective method of birth control to prevent exposing a fetus to a potentially dangerous agent with unknown risk. If you are pregnant or currently breast feeding, you may not participate in this registry. You understand that if you are pregnant, if you become pregnant, or if you are breast-feeding during this registry, you or your child may be exposed to an unknown risk. In case you become pregnant while taking part in the registry, you should contact the study doctor right away.

What are the possible benefits to you or others?

The benefit of having any catheter ablation is that your heart rhythm disturbance is cured. This is also the case in the vast majority of cases. Your hospital will be able to give you exact figures, depending on the type of ablation and your individual case. A small number of individuals will need more than one session of treatment.

There may be no benefits to you for participating in this registry. Medical science may benefit from your participation which may lead to benefits for future patients with this condition. Your participation may also contribute to the creation of new diagnostic tests, new medicines or other procedures that may have commercial value. However, your participation in this registry will not entitle you to a share in any future economic benefits.

If you do not want to take part in this registry, what other options are available to you?

You may choose not to participate in this registry. You and your doctor have decided to proceed with a catheter ablation procedure. If you refuse to participate, you will receive a catheter ablation procedure and standard care as decided upon by your doctor.

If you choose to take part in this registry, what are the costs?
You will not be charged the costs specifically related to the registry. The costs not specifically related to the registry will be charged and reimbursed as usual by your health care coverage. Additionally, you will not be paid for your participation.

What if you are injured because of this registry?
If you suffer any injuries, illnesses, or complications as a direct result of participation in this registry, medical treatment will be available to you. You or your insurance company will be responsible for all costs resulting from such treatment. No other arrangement has been made for other compensation (such as lost wages, lost time or discomfort) with respect to such injuries. However, signing this consent form in no way limits your legal rights against the sponsor, investigators, or anyone else, and you do not release the study doctors or participating institutions from their legal and professional responsibilities.

During the registry, if you experience any injuries, illnesses, or complications from taking part in this registry, please contact Dr. _____ at ___-___-_____.

What are your rights if you decide to take part in this registry?
Your signature on this consent form means that you have received information about this registry and that you agree to be a part of the registry.

You may stop taking part in the registry at any time without penalty or loss of benefits to which you are otherwise entitled. If you wish to stop taking part in this registry for any reason, you should contact Dr. _____ at ___-___-_____.

If you do withdraw your consent during the registry, the study doctor and relevant study staff will not collect additional personal information from you, although personal information already collected will be retained to ensure that the results of the registry project can be measured properly and to comply with the law. You should be aware that data collected by the sponsor up to the time you withdraw will be part of the study results.

Your study doctor or designee will discuss with you what follow-up is required if you decide to withdraw, or are withdrawn from the registry before the registry is finished.

Your doctor or the sponsor of the registry (St. Jude Medical, Inc.) may also stop your participation in the registry at any time, without your consent, for any reason.

How will your information be kept confidential?

To help keep your medical file and personal information confidential, only certain authorized people will have access to your records. These include the researchers in your hospital who are part of this registry, the sponsor, its affiliates and representatives of SJM that perform study-related services in the United States (U.S.), Europe and other countries, the regulatory authorities and/or the ethical committees, insofar as this relates to this registry. The goal of this access is to follow-up on the registry progress, to verify the registry data and procedures, and to ensure that the information collected for this registry is accurate. Your study doctor or one of his/her colleagues will supervise the access to your personal records.

Your personal data will be key-coded using a unique patient number before they are processed with the purpose not to permit your identification, except if necessary for the purpose of the trial or for regulatory obligations. Your coded registry data will be processed manually as well as by computer and analyzed during and after the registry.
Your coded personal data may be transferred outside of the European Economic Area, including to the U.S., for purposes that include, without limitation, processing, monitoring, auditing and control of the registry or the conduct of inspections by the relevant authorities, medical product development, additional scientific analysis of the registry data and obtaining approval to use and market medical products resulting from, or related to the registry. Your coded registry data may be transferred to other countries where data protection laws may not be as strict as in your own country. However, SJM has taken security measures to ensure your identity will not be disclosed.

You have a right to access your personal data and to have any justifiable corrections made. If you wish to do so, you should request this to your study doctor.
A description of this clinical trial will be available on http://www.ClinicalTrials.gov, as required by U.S. Law. This website will not include information that can identify you. At most, the website will include a summary of the results. You can search this website at any time.

By signing the Patient Informed Consent form, you authorize the Sponsor to use the information obtained during the registry for scientific communications and publications in medical journals without disclosing your name and any other information that could identify you. By signing, you also agree that your general practitioner may be informed of your participation in this registry unless you specifically request not to do so.

[Note: Be sure to include Statement about any additional data privacy protection needed per national or regional regulations.]

Who can you contact for registry information?

If you have any questions about the registry or taking part in this registry, please contact Dr. _____ at ___-___-_____.

In addition, if you have any concerns, complaints or questions about your rights as a registry patient or an injury that you believe is a registry-related, please contact:

Name of person at IRB/EC:
Title of person at IRB/EC:
IRB/EC phone number:
IRB/EC email, if known:

Consent and authorization for participation in this registry

Taking part in this registry is entirely voluntary. You are making a decision on whether or not to take part in the registry. Your signature indicates that you have read the information in this form and have decided to take part in the registry. You will be given a signed copy of this form to keep.

- I have read all of the above information in this consent and authorization form. I have had the opportunity to ask questions and have received answers concerning areas I did not understand.
- I willingly give my consent to participate in this registry and to comply with the procedures related to it.
- I confirm that my relevant coded personal data collected during the registry will be used in the analysis and communicated in publications.
- I understand that I am free to refuse to participate in the proposed registry, without giving any reason and without my medical care or legal rights being affected.
- I understand that I am free to withdraw from the proposed registry at any time, without giving any reason, without my medical care or legal rights being affected.
- I give my permission to representatives from the sponsor, *[the ethics committee]* and the regulatory authorities to access my medical records.
- I understand that my personal physician will be informed of my participation in this registry.

Name of Participant (please print) _____

Signature _____ Date _____

Name of Person Obtaining Consent (please print) _____

Signature _____ Date _____

If participant or participant's legally acceptable representative, is unable to read:

I have attended the entire informed consent discussion. I attest that the information in the consent form and any other written information was accurately explained to, and apparently understood by, the patient or the patient's legally acceptable representative. Informed consent was freely given by the patient or the patient's legally acceptable representative.

Impartial Witness Name (please print) _____

Signature _____ Date _____

Appendix G: CASE REPORT FORMS

The electronic Case Report Forms will be kept under a separate cover and is available upon request.