

DEPARTMENT OF HEALTH AND HUMAN SERVICES
FOOD AND DRUG ADMINISTRATION
CENTER FOR DEVICES AND RADIOLOGICAL HEALTH



*Division of Cardiovascular Devices
Pacing, Defibrillator & Leads Branch*

Date: 28 Oct 2011

From: [REDACTED] Biomedical Engineer, FDA/CDRH/ODE/DCD/PDLB

Subject: P960013/S066
St Jude Medical
Tendril STS 1988TC and 2088TC pacing leads

Contact: Geena George, Regulatory Affairs Specialist

To: The Record

Recommendation: **Approval**

[REDACTED] Lead Reviewer	Date	Mitchell Shein, Branch Chief	Date
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Executive Summary

This PMA supplement was submitted to gain approval for three additional lead lengths for the Tendril STS 1988TC and 2088TC pacing leads in order to “accommodate customer needs.” The review focused mainly on the use of these longer leads and whether or not that use should require updates to labeling or additional bench testing.

The clinical reviewer indicated that the absence of labeling or indications for use updates for the additional lead lengths was not concerning from a clinical perspective. The mechanical reviewer noted initial concerns with the absence of quantitative evidence that supports the firm’s statement that loading in the more atypical implant locations does not present concerns from a lead durability perspective. Several interactive discussions (focusing on the loading itself as well as the failures noted in the sponsor’s approved longer length leads) were conducted via email with the sponsor to eventually resolve the reviewer’s concerns.

All concerns have been addressed at this time and approval is recommended.

Review Team

[REDACTED] lead reviewer, FDA/CDRH/ODE/DCD/PDLB
[REDACTED] mechanical reviewer, FDA/CDRH/ODE/DCD/PDLB
[REDACTED], MD, clinical reviewer, FDA/CDRH/ODE/DCD/PDLB

Indications For Use

The firm noted that the indications for use for the subject leads are identical to the indications currently approved.

LEAD REVIEWER COMMENTS: The clinical reviewer confirmed that the additional lengths would not impact the acceptability of the current indications and contraindications for use. Therefore, there are no concerns regarding this section of the review.

Device Description

The subject leads are straight, bipolar, steroid eluting, active fixation leads with (b) (4) insulation designed for permanent sensing and pacing in combination with a pulse generator. Model 1988TC and 2088TC are identical with the exception of the presence of (b) (4) coating (only on model 2088TC).

Detailed Description of Change

The 1988TC and 2088TC leads are currently offered in lengths of 46, 52, 58 cm. The firm proposes to add the lengths of 65, 85, and 100 cm to meet customer needs; these new, longer leads are identical in design to the market approved leads.

FDA requested the sponsor discuss eleven specific questions/concerns within their submission. These questions focused on the use of the longer length leads, the expected loading, and the need for any labeling changes.

LEAD REVIEWER COMMENTS: The firm's responses to the eleven specific questions were informative and found acceptable. The mechanical reviewer was initially concerned with the firm's lack of quantitative assessment of the loading environment in more atypical implant location (these concerns are presented in more detail in her review memo). However, additional literature research was conducted and additional information was requested from the sponsor specific to the post market performance of the Model 1688 lead in its longer length varieties. Considering all of this information (including the absence of a post market signal for longer lead lengths), the mechanical reviewer noted that the initial concerns with the potentially different (although not necessarily more rigorous) loading of the longer length leads were resolved. It was also noted that the sponsor is not requesting indications for atypical implantation procedures.

Preclinical/Bench Evidence

The firm provides the following testing to support their requested change. The DVT report is in Appendix 3.

- Sterilization
- Temperature Shock
- Helix Extension/Retraction
- Repeated Helix Extension/Retraction
- Helix Extension/Retraction After Soak
- Helix Over Extension
- Stylet Insertion/Withdrawal
- DC Resistance

A sample size of 31 leads was used to ensure 95% confidence and 90% reliability. All samples used were of final manufactured form.

A rationale for not repeating the other "standard" suite of tests is provided.

LEAD REVIEWER COMMENTS: The mechanical reviewer evaluated the provided test report for methods and results as well as to assess the adequacy of the conducted tests to evaluate the proposed changes (i.e. longer lead length). She found the testing performed (including sample size and statistical significance) and rationale for testing not performed acceptable and in support of approval - the elements assessed were the only she believed might be impacted by the proposed change. The issue of different loading from different implant locations was

considered and addressed as detailed in the description of changes section of this memo. Several questions and concerns were addressed interactively to help the reviewer reach the conclusion that the testing provided was adequate. These interactions are described in detail in the mechanical reviewer memo, but the general topics of each are summarized below:

- Rationale for specimens tested in helix extension/retraction protocol
- Results of helix extension/retraction testing
- Expected loading of longer length leads with specific examples
- Post market performance of already-approved longer length leads

Packaging, Shelf Life, and Sterilization

The firm indicates that no changes are proposed to the packaging, sterilization methods, or shelf life (3 years) of the market approved leads. A Sterilization Verification Report is provided in Appendix 4.

LEAD REVIEWER COMMENTS: The sterilization report was reviewed by the lead reviewer. The firm cited the appropriate AAMI and ISO standards and noted that the longest (worst case) lead was used in the endotoxin, bioburden, gas residual and sterility testing. The rationale provided for not conducting sterilization efficiency or load configuration testing is, in this reviewer's opinion, acceptable. In addition, the sponsor confirmed via email that the methods (including sample sizes) and acceptance criteria of the sterilization validation testing conducted is identical to that used to support approval of the predecessor lead lengths.

Biocompatibility

The firm indicates that no new materials or manufacturing processes were incorporated as a result of the proposed modifications.

LEAD REVIEWER COMMENTS: No new manufacturing processes or materials are proposed with the requested changes; therefore no biocompatibility concerns exist.

Clinical Data

No clinical data was provided to support approval of this submission.

LEAD REVIEWER COMMENTS: The proposed modification is such that appropriate evaluation can be made with a risk assessment and in a bench testing environment. Therefore, there are no concerns with the absence of clinical data to support the requested change. This conclusion was confirmed with the clinical reviewer.

Labeling

The firm indicates that the only change to the subject leads' labeling is to add the new length options to the specification sheet. A redlined copy of that sheet is provided in Appendix 5.

LEAD REVIEWER COMMENTS: The redlined copy of the labeling was reviewed by the lead reviewer. The following changes were noted: (1) updates to the electrical resistance parameters for the new longer lengths and (2) alterations in the specification for the amount of drug were located. The firm clarified via email that no changes to the drug specifications were being proposed in this submission and that the redlined updates in the submission were made in error.

The clinical reviewer noted that no additional labeling for specific uses of longer length leads should be required (especially since specific indications for such a request are not made within this submission). Such labeling would be difficult to draft since each case would probably be unique. Also, standard lead lengths might be used in atypical procedures, but no specific warnings/ guidance are provided for those cases. In addition, no such additional warnings are provided in the labeling for the firm's other leads available in longer lengths.

Based on the clinical reviewer's comments, no concerns exist with the (minor) labeling changes and absence of direct mention of atypical implantation procedures.

Risk Management

The firm indicates that no significant differences existed for the risk analysis based on the proposed changes. The Risk Management report is provided in Appendix 2.

LEAD REVIEWER COMMENTS: The Risk Management report was reviewed by the lead reviewer. The firm highlighted the following risks for the additional lead lengths- increase in implantation time due to (b) (4)

and infection risk (b) (4). In this reviewer's opinion, the firm has correctly identified the risks of the proposed changes and there are no concerns with this section. The bench testing reviewed by the mechanical reviewer above in the preclinical section demonstrates that these risks have been appropriately mitigated in my opinion. (This conclusion was confirmed with the mechanical reviewer.)

Manufacturing

Manufacturing was not discussed within the submission.

LEAD REVIEWER COMMENTS: The sponsor confirmed via email that no changes have been made to the manufacturing processes or facilities as a result of the proposed change. Therefore, there are no concerns with this section of review.

Summary of interactive Review/correspondence

Round 1 interactive discussion:

20 Sep 2011 questions sent to sponsor

27 Sept 2011 responses received from sponsor

Topics covered:

- Post market experience with longer lengths of already-approved leads
- Removal of drug update
- Sterilization testing use in previous submission
- Helix extension/retraction specimen selection and results
- Presence of manufacturing changes

Round 2 interactive discussion:

18 Oct 2011 questions sent to sponsor

28 Oct 2011 email responses received from sponsor

Topics covered:

- Confirmation that shorter lengths tested not subject in this submission
- Confirmation on labeling changes
- Explanation of in vivo loading of longer lengths
- Clarification on post market performance of longer lengths of already-approved leads