SUMMARY OF SAFETY AND EFFECTIVENESS DATA (SSED)

I. GENERAL INFORMATION

Device Generic Name: Vascular Hemostasis Device
Device Trade Name: Perclose® ProGlide® 6F Suture-Mediated Closure System

Device Procode: MGB

Applicant's Name and Address: Abbott Vascular
400 Saginaw Drive
Redwood City
CA 94063

Date(s) of Panel Recommendation: NONE

Premarket Approval Application (PMA) Number: P960043/S80

Date of FDA Notice of Approval: April 15, 2013

Expedited: *"not applicable"*

The original PMA (PMA 960043) was approved on April 30, 1997 and is indicated for the percutaneous delivery of suture for closing the common femoral artery access site of patients who have undergone diagnostic or interventional catheterization procedures using 5 to 8F sheaths. Perclose® ProGlide® 6F Suture-Mediated Closure System reduces the time to hemostasis, ambulation (10 feet) and discharge in patients who have undergone diagnostic or interventional catheterization procedures without complicating clinical conditions. The SSED to support the indication is available on the CDRH website and is incorporated by reference here. The current supplement was submitted to expand the indication for the Perclose ProGlide 6F Suture Mediated Closure System to close up to 21F sized openings.

II. INDICATIONS FOR USE

The Perclose ProGlide 6F Suture-Mediated Closure System (ProGlide SMC) is indicated for the percutaneous delivery of suture for closing the common femoral artery access site of patients who have undergone diagnostic or interventional catheterization procedures using 5F to 21F sheaths. For sheath sizes greater than 8F, at least two devices and the pre-close technique are required.

III. CONTRAINDICATIONS

None.

IV. WARNINGS AND PRECAUTIONS

The warnings and precautions can be found in the ProGlide SMC device labeling.

V. DEVICE DESCRIPTION

The ProGlide SMC System is designed to deliver a single monofilament polypropylene suture to close femoral artery puncture sites following diagnostic or interventional procedures such as minimally invasive cardiac surgery, cardiopulmonary bypass, isolated balloon aortic valvuloplasty (BAV), transcatheter aortic valve implantation (TAVI), and percutaneous thoracic endovascular aortic aneurysm repair (PTEVAR).

The ProGlide SMC device is composed of a plunger, handle, guide, and sheath. The ProGlide SMC tracks over a standard 0.038" (or smaller) guide wire. A hemostasis valve restricts the blood flow through the sheath with or without the guide wire in place. The guide houses the needles, and the foot, and precisely controls the placement of these needles around the puncture site. The handle is used to stabilize the device during use. The plunger advances the needles and is used to retrieve the suture. A marker lumen is contained within the guide, with the intraluminal port of the lumen positioned at the distal end of the guide. Proximally, the marker lumen exits from the body of the device. The marker lumen allows a pathway for back-bleeding from the femoral artery to ensure proper device positioning.

A knot pusher accessory (Perclose® Snared Knot Pusher and/or Suture Trimmer) is included, and is designed to position the pre-tied suture knot to the arteriotomy. The Perclose Suture Trimmer is also designed to trim the trailing limbs of suture.

The expanded indications for use to now include closure of up to 21F sized openings, as well as the specified mention that at least two closure devices to be used are the differences between the indications for use of this version and the original version of the device. There are no technological differences in the device design.

VI. ALTERNATIVE PRACTICES AND PROCEDURES

There are several methods used for achieving femoral artery puncture hemostasis post-catheterization. For small sized punctures up to and including 10F, methods used for hemostasis include manual compression, mechanical compression, other vessel closure devices, and surgical closure. For large sized holes up to 21F in size, surgical cutdown is the standard for closure of openings this size.

VII. MARKETING HISTORY

The ProGlide SMC Device has been commercially available in the United States since May 2004. The ProGlide SMC is also available for sale in over 50 countries outside of the United States in the European Union, Middle East, Asia Pacific, Latin America and Africa. The ProGlide SMC has not been withdrawn from marketing in any country for any reason.

VIII. POTENTIAL ADVERSE EFFECTS OF THE DEVICE ON HEALTH

Potential complications associated with the use of vascular closure may include, but are not limited to, the following:

- Allergic reaction or hypersensitivity to device components
- Anemia
- Arterial stenosis/occlusion
- Arteriovenous fistula
- Bleeding/hemorrhage
- Bruising/hematoma
- Death
- Deep vein thrombosis
- Device entrapment
- Device failure/malfunction/misplacement
- Diminished pulses distal to closure site
- Embolism
- Extended Hospitalization / Delayed time to ambulation
- Infection/sepsis
- Inflammation
- Intimal tear/dissection
- Ischemia distal to closure site
- Nerve injury
- Numbness
- Pain
- Perforation
- Pseudoaneurysm
- Retroperitional hematoma/bleeding
- Surgical exposure/closure of common femoral artery
- Thrombus formation
- Vascular injury
- Vasovagal episode
- Vasoconstriction/vasospasm
- Wound dehiscence

For the specific adverse events that occurred in the clinical studies, please see Section X below.

IX. SUMMARY OF PRECLINICAL STUDIES

A series of non-clinical laboratory studies related to the ProGlide SMC Device was performed to obtain approval for delivering sutures to close femoral artery access sites and was detailed in P960043 and/or related supplements. No additional preclinical studies were conducted to support the proposed indication.

X. SUMMARY OF PRIMARY CLINICAL STUDY(IES)

A clinical study was performed to establish the safety and effectiveness of using the ProGlide SMC device for femoral artery access site closure up to 21F sheaths. Abbott Vascular conducted this clinical trial in collaboration with Endologix, Inc. Abbott used the Perclose ProGlide SMC and Perclose ProStar XL suture mediated closure devices in this study. Endologix, Inc. used their IntuiTrak Powerlink System, which is a unibody, self-expandable stent graft for the endovascular repair of abdominal aortic aneurysms (AAAs). In order to modify the indications for use for both the IntuiTrak and Perclose ProGlide, Abbott Vascular and Endologix, Inc. conducted a joint clinical study. All three devices utilized in the study have been previously approved via the Premarket Approval (PMA) process. The focus of this PMA Supplement is the ProGlide SMC device; therefore only data from the clinical study related to ProGlide SMC were the basis for a PMA Supplement approval decision. The data from the Perclose ProStar XL Suture Mediated Closure Device will be provided in a subsequent PMA Supplement. A summary of the clinical study using the Perclose ProGlide SMC device is presented below.

A. Study Design

The Percutaneous EndoVascular Repair, or PEVAR, trial is a prospective, multicenter, randomized concurrently-controlled clinical trial. The trial used the following study devices.

- Endologix, Inc.: Powerlink System with IntuiTrak Endovascular Delivery System®
- Abbott Vascular, Inc.: ProGlide SMC and the Perclose Prostar XL Suture-Mediated Closure Systems. However, the focus of this PMA Supplement is the approval for an expanded indication for use for the ProGlide SMC.

Patients with AAA who were suitable candidates for endovascular repair using the IntuiTrak System and for percutaneous femoral artery closure who met the prospectively defined inclusion/exclusion criteria were randomized (1:1:1) to treatment with the IntuiTrak System via a totally percutaneous access approach (PEVAR=Test, ProGlide SMC or Perclose ProStar XL) or via a standard vascular exposure cutdown approach (SEVAR=Control). This patient population was considered appropriate because endovascular repair of AAA has become the gold standard, as well as the ample number of patients needing the aneurysm fixed that a meaningful clinical study can be conducted. PEVAR patients had their femoral artery access sites closed using either the ProGlide SMC device or Prostar XL SMC device. Prior to the randomization of the first patient at each investigational site, a minimum

of 2 patients were treated in a roll-in phase at the investigational site. Roll-in patients underwent the same treatment and follow-up as the randomized patients.

The PEVAR trial was designed to evaluate the safety and effectiveness of the ProGlide SMC device using the pre-close technique to percutaneously close ipsilateral femoral artery access sites up to 21F sheath size. The design of the study to evaluate the PEVAR arm was considered adequate because the study randomized against the standard method for access, which is surgical cutdown and closure. The endpoints used to assess the ProGlide SMC device are a subset of the endpoints used for the PEVAR trial. Because major access site ipsilateral events are expected to occur within 30 days post-procedure, this time frame was used to assess the primary endpoint. The primary analysis is based on a non-inferiority hypothesis test to demonstrate the PEVAR (ProGlide) arm is non-inferior to the SEVAR arm. Data from the PEVAR (ProGlide) (n=50) and SEVAR (n=50) arms are briefly presented below.

Clinical Inclusion Criteria:

- Male or female at least 18 years old;
- Informed consent form understood and signed and patient agrees to all follow-up visits;
- AAA with maximum diameter ≥5cm, or in the range of 4 to 5cm which has increased by 0.5cm or more in the past 6 months;
- Have a suitable ipsilateral common femoral artery for percutaneous access using a pre-close- technique (i.e., a 2cm segment for access is at least 10mm above the origin of the profunda femoralis branch, and below the lower margin of the inferior epigastric artery as determined on preoperative high-resolution contrast-enhanced CT scan);
- Anatomically eligible for the IntuiTrak System per the FDA-approved indications for use (IFU):
  1) adequate ipsilateral access vessel diameter compatible with delivery systems (≥7mm); adequate vessel diameter for contralateral limb extension (≥6.5mm);
  2) proximal non-aneurysmal neck having diameter between 18 and 32mm, length ≥15mm, and angulation to aneurysm sac ≤60°;
  3) if the proximal non-aneurysmal neck is >26 mm in diameter, one or more options for treatment using the XL sizing algorithm is available;
  4) common iliac artery fixation site having diameter between 10 and 23mm, length ≥15mm, angulation to bifurcation bilaterally ≤90°;
  5) ability to preserve at least one hypogastric artery;
  6) renal to bifurcation length at least 1cm longer than the selected bifurcated stent graft

Clinical Exclusion Criteria:

- Life expectancy < 1 year as judged by the investigator;
- Psychiatric or other condition that may interfere with the study;
- Participating in the enrollment or 30-day follow-up phase of another clinical study;
- Known allergy to any device component;
- Coagulopathy or uncontrolled bleeding disorder;
- Contraindication to contrast media or anticoagulants;
- Ruptured, leaking, or mycotic aneurysm;
- Serum creatinine (s Cr) level >1.7 mg/dL (This criterion is waived for patients on dialysis prior to study screening/enrollment.);
- Traumatic vascular injury;
- Active systemic or localized groin infection;
- Connective tissue disease (e.g., Marfan's Syndrome);
- Renal transplant patient;
- Recent (within prior 3 months) cerebrovascular accident or myocardial infarction;
- Planned major intervention or surgery within 30 days following the EVAR procedure;
- Requirement for an arterial conduit at the access site;
- Morbidly obese (body mass index $\geq 40 kg/m^2$);
- Calcification throughout the CFA target area anterior wall or circumferentially or over >50% of the posterior wall;
- Femoral artery aneurysm, arteriovenous fistula or pseudoaneurysm;
- Evidence of prior common femoral artery surgery (e.g., groin incision);
- Prior clip-based vascular closure device placement in either arterial access site;
- Collagen-based vascular closure device placement in either arterial access site within the prior 90 days;
- Femoral artery needle puncture in either arterial access site within the prior 30 days;
- Hematoma at the ipsilateral arterial access site;
- Significant scarring at the ipsilateral arterial access site.

Follow-up Schedule

Prior to discharge, subjects underwent protocol-required exams and testing. Subsequent follow-up visits at the investigational sites were at 1 and 6 months.

Table 1 provides a summary of the required clinical assessments for subjects at the scheduled follow-up visit.

Table 1: Schedule of Evaluation

Schedule of Tests:	**Pre-Discharge**	**1 Month (Primary Endpoint)**	**6 Months**
Physical Exam[†]	x	x	x
Blood Labs[‡]	x	x	x
Contrast-enhanced CT scan[¥]	*	x	*
Ankle-brachial Index	x	x	x
Femoral Ultrasound[Φ]	x	*	x
SF-36 Quality of Life		x	x
Pain Scale	x	x	x
Adverse Events[$]	x	x	X

[†]The physical exam includes overall health and physical assessment, lower extremity sensorimotor exam, vital signs, and ankle-brachial index (i.e., for assessment of peripheral blood flow).

[‡]Blood labs include serum creatinine, blood urea nitrogen, hematocrit, and hemoglobin. S-Cr >1.7mg/dL is an exclusionary condition unless the patient is on dialysis.

[¥]The baseline high resolution, contrast-enhanced CT scan performed within the prior three months will be performed for independent physician evaluation of anatomical measurements and characteristics. This baseline evaluation will serve to determine patient anatomical eligibility for the IntuiTrak System and femoral artery quality per trial criteria. Contrast-enhanced CT scan of the abdomen and pelvis is required at one month for both stent graft assessment and for assessment of groin/access-related complications.

[Φ]The femoral ultrasound is required pre-discharge and at six months for assessment of groin/access-related complications.

[$]Adverse event reports and source documents will be reviewed by an independent Clinical Events Committee for determination of event inclusion in the statistical analyses.

*Optional per site standard of care and Principal Investigator discretion

Clinical Endpoints

The primary endpoint is a composite of events that constitute the major ipsilateral access site vascular complication rate at 30 days, which is defined as the composite of the following:

- access site vascular injury requiring surgical repair, angioplasty, or ultrasound-guided compression, or thrombin injection
- new onset lower extremity ischemia that is attributed to arterial access or closure causing a threat to the viability of the limb and requiring surgical or additional percutaneous intervention
- access site-related bleeding requiring transfusion
- access site-related infection requiring intravenous antibiotics or a prolonged hospitalization
- access site-related nerve injury that is permanent or requires surgery

The select secondary endpoints are:

- Procedure time was defined as elapsed time from the first skin break to final closure (skin to skin time)
- Minor ipsilateral access site complications included minor ipsilateral access site vascular complications and narcotic analgesic use for ipsilateral access

site pain at 30 days. The minor ipsilateral access site vascular complications included:

- Access site pseudoaneurysm or AV fistula documented by ultrasound,
- Access site hematoma ≥ 6 cm
- Post-discharge access site-related bleeding requiring > 30 minutes to re-achieve hemostasis
- Lower extremity arterial emboli or stenosis that is attributed to arterial access or closure
- Deep vein thrombosis
- Access site-related vessel laceration
- Transient access site-related nerve injury
- Access site wound dehiscence
- Access site related lymphocele
- Localized access site infection treated with intramuscular or oral antibiotics

- Time to actual hospital discharge was defined as elapsed time from sheath removal to actual physical discharge from the hospital.
- Time to ambulation was defined as elapsed time between sheath removal and time when the patient stands and walks at least 20 feet without re-bleeding.
- Ipsilateral pain score at pre-discharge
- Closure device success was defined as successful achievement of index procedure ipsilateral access site hemostasis with percutaneous closure without surgical intervention.
- Ipsilateral access site closure success was defined as successful achievement of hemostasis with percutaneous closure devices and without surgical intervention and freedom from major ipsilateral access site vascular complications within 48 hours of the index procedure or hospital discharge, whichever occurs first.
- Time to hemostasis for the ipsilateral access site was defined as elapsed time from sheath removal to first observed cessation of CFA bleeding (excluding cutaneous or subcutaneous oozing).

B. Accountability of PMA Cohort

Of the 100 patients who were enrolled in the PEVAR (ProGlide) and SEVAR randomized arms, all patients completed the 1-month follow-up visit. The one month data were used to assess the primary endpoint. FDA did not review any 6 month data that were collected since these data were not used to assess the primary endpoint and there was incomplete follow-up at this time point.

C. Study Population Demographics and Baseline Parameters

In general, baseline demographics were comparable between the PEVAR (ProGlide SMC) and the SEVAR patients. There was a difference in age between the PEVAR (ProGlide SMC) and SEVAR arms (69.9 ± 6.6 vs. 73.2 ± 8.8 years), which did not appear to affect the overall study outcome based on additional adjusted analysis.

This trial enrolled 92% men. Aortic abdominal aneurysm (AAA) is a disease of white elderly male prevalence, hence the resultant low rate of females participating in the PEVAR (ProGlide) trial. Because there were a very limited number of female subjects treated in the trial, no meaningful conclusions can be drawn by the gender analysis.

Additionally, a significantly greater proportion of ProGlide SMC patients were in American Society of Anesthesiologists (ASA) Class 3 or 4, and had significantly increased body weight (similar body mass index). These statistically significant differences in the baseline demographics represent the worst case scenario for the device group.

D. Safety and Effectiveness Results

A successful ipsilateral 'pre-close' percutaneous technique, defined as closure with the ProGlide SMC, was achieved in 96% (48/50) PEVAR (ProGlide) subjects. Among these 50 subjects, the number of closure devices used in the procedure was 1 (n=1, 2.0%), 2 (n=37, 74%), 3 (n=9, 18%), 4 (n=2, 4.0%) or 5 (n=1, 2.0%).

1 Primary Endpoint

The primary endpoint is a composite of events that constitute the major ipsilateral access site vascular complication rate at 30 days (as defined in Section X.A).

The formulation of the hypothesis for the primary endpoint is:

$H_0: p_t - p_c \geq \delta$ $\quad\quad$ $H_A: p_t - p_c < \delta$

Where p_t is the Major Ipsilateral Access Site Vascular Complication rate at 30 days in the PEVAR (ProGlide) arm; p_c is the Major Ipsilateral Access Site Vascular Complication rate at 30 days in the SEVAR arm; δ is the non-inferiority margin, which is set to be 10%.

The study results showed that at 30 days, PEVAR (ProGlide) patients had a 6.0% (3/50) major ipsilateral access site vascular complication rate vs. the SEVAR patients who had a 10% (5/50) major ipsilateral access site vascular complication rate. The non-inferiority test for the primary endpoint revealed a p value = 0.0048 and resulted in the rejection of the null hypothesis, demonstrating that ProGlide is non-inferior to SEVAR in the closure of femoral artery access sites up to 21F sheath size. These data are shown in Table 2.

Table 2: Non-inferiority Test for Primary Endpoint – Per Subject Analysis (Modified Intent-to-Treat Population[1] - ProGlide vs. SEVAR)

	ProGlide N = 50	SEVAR N = 50	*p*-value[3]
Major Ipsilateral Access Site Vascular Complication at 30 days [95% Confidence Interval][2]	6.0% (3/50) [1.3%, 16.5%]	10.0% (5/50) [3.3%, 21.8%]	0.0048

[1]*Defined as all patients who were randomized and treated*
[2]*By Clopper-Pearson exact confidence interval*
[3]*One-sided p-value and 95% confidence interval for non-inferiority test by using asymptotic test statistics with non-inferiority margin of 10%.*

2 Summary of Adverse Events

Adverse events related to major and minor ipsilateral access sites vascular complications that occurred within the first 30 days are listed in the Table 3.

Table 3: Major and Minor Ipsilateral Access Site Vascular Complications Through 30 Days[1]

	ProGlide N = 50	SEVAR N = 50
Major Ipsilateral Access site Vascular Complications at 30 Days	6.0% (3/50)	10.0% (5/50)
Access site vascular injury requiring surgical repair, angioplasty, or ultrasound-guided compression, or thrombin injection	2.0% (1/50)	2.0% (1/50)
New onset lower extremity ischemia that is attributed to arterial access or closure causing a threat to the viability of the limb and requiring surgical or additional percutaneous intervention	4.0% (2/50)	4.0% (2/50)
Access site-related bleeding requiring transfusion	2.0% (1/50)	4.0% (2/50)
Access site-related infection requiring intravenous antibiotics or a prolonged hospitalization	0.0% (0/50)	0.0% (0/50)
Access site-related nerve injury that is permanent or requires surgery	0.0% (0/50)	2.0% (1/50)
Minor Ipsilateral Access Site Vascular Complications at 30 days	4.0% (2/50)	8.0% (4/50)
Access site pseudoaneurysm or AV fistula documented by ultrasound	0.0% (0/50)	0.0% (0/50)
Access site hematoma ≥ 6cm	0.0% (0/50)	2.0% (1/50)
Post-discharge access site-related bleeding requiring > 30 minutes to re-achieve hemostasis	0.0% (0/50)	0.0% (0/50)
Lower extremity arterial emboli or stenosis that is attributed to arterial access or closure	4.0% (2/50)	4.0% (2/50)
Deep vein thrombosis	0.0% (0/50)	0.0% (0/50)

	ProGlide N = 50	**SEVAR N = 50**
Access site-related vessel laceration	0.0% (0/50)	0.0% (0/50)
Transient access site-related nerve injury	0.0% (0/50)	2.0% (1/50)
Access site wound dehiscence	0.0% (0/50)	0.0% (0/50)
Access site related lymphocele	0.0% (0/50)	0.0% (0/50)
Localized access site infection treated with intramuscular or oral antibiotics	0.0% (0/50)	0.0% (0/50)

[1] *Include only each subject's first occurrence of each event; one subject had 2 events, in each arm*

The summaries of the major ipsilateral access site vascular complications where patients were converted to surgical vascular access are as follows:

The first subject had the absence of ipsilateral pedal pulses as evidenced by lack of Doppler signals following the procedure performed using three ProGlide devices for pre-close of the ipsilateral common femoral artery (CFA). A check angiography revealed significant stenosis of the ipsilateral CFA at the level of the femoral artery bifurcation. A vascular cutdown was performed which revealed posterior plaque protruding into the CFA. An endarterectomy with bovine pericardial patch angioplasty was performed resulting in restored distal pulses.

The second subject had significant intra-procedural blood loss following attempted use of four ProGlide devices for pre-close of the ipsilateral CFA. The investigator decided to convert to a vascular surgical cutdown. A total estimated blood loss of 1300mL was recorded and the subject received 750mL returned through the use of a Cell Saver with no other blood products given.

The third subject who had a serious complication in the PEVAR (ProGlide) arm, but who did not require conversion to open surgery consisted of a subject with intra-procedural loss of ipsilateral Doppler signal due to pre-existing stenosis of the CFA. This was treated by placement of a stent in the right common femoral artery that resulted in restoration of Doppler signal.

3 Secondary Endpoint Results and Select Additional Safety and Effectiveness Endpoints

As shown in Table 4**,** the PEVAR (ProGlide) arm had a 25% shorter procedure time than the SEVAR arm (106.5 ± 44.9 vs. 141.1 ± 73.4**,** p=.0076). There were no differences in the minor ipsilateral access site complications, time to actual hospital discharge, time to ambulation and ipsilateral pain score at pre-discharge between the PEVAR (ProGlide) and SEVAR arms. In the ProGlide arm, the time to hemostasis for the ipsilateral access site was 57% shorter than in the SEVAR arm (9.8 ± 17 vs, 22.7 ± 22.9 minutes, 95% CI of the difference [-21.1, -4.7]). In addition, the ProGlide

SMC device achieved a device success rate and access site closure success rate at 96% and 94%, respectively.

Additionally, femoral artery ultrasound and ABI were performed. There were 49 femoral artery ultrasounds performed in the PEVAR (ProGlide) arm and 48 femoral artery ultrasounds performed in the SEVAR arm. In the PEVAR (ProGlide) arm, there was 1 subject who had abnormal fluid collection at the ipsilateral access site and 1 subject had a hematoma on the right (ipsilateral) groin. For the SEVAR arm there was 1 subject that had abnormal fluid collection at the ipsilateral access site and 1 subject that showed arterial flow velocity changes and a hematoma. There were no adverse clinical sequelae for any of these occurrences. Furthermore, for PEVAR (ProGlide), the ipsilateral ABIs were1.07 ± 0.14 at baseline, 1.04 ± 0.14 at pre-discharge, and 1.06 ± 0.16 at 1 month; for SEVAR the ipsilateral ABI values were 1.05 ± 0.15 at baseline, 1.06 ± 0.14 at pre-discharge, and 1.06 ± 0.13 at 1 month. The information obtained from the femoral artery ultrasound and ABI are comparable between the PEVAR (ProGlide) and SEVAR arms.

Table 4: Select Additional Safety and Effectiveness Endpoints

Endpoints	ProGlide N = 50	SEVAR N = 50	Difference (95% CI)[1]	Superiority Test p-value
Procedure Time (minutes) [95% Confidence Interval][1]	106.5 ± 44.9 (50) [93.7, 119.2]	141.1 ± 73.4 (50) [120.3, 162.0]	-34.7 [-58.9, -10.4]	0.0076[3]
Minor Ipsilateral Access Site Complication at 30 days[5] [95% Confidence Interval][2]	22.0% (11/50) [11.5%, 36.0%]	30.0% (15/50) [17.9%, 44.6%]	-8.0% [-25.1%, 9.1%]	0.4954[4]
Minor Ipsilateral Access Site Vascular Complications at 30 days [95% Confidence Interval][2]	4.0% (2/50) [0.5%, 13.7%]	8.0% (4/50) [2.2%, 19.2%]	-4.0% Assumptions not met[6]	--
Narcotic Analgesic Use for Ipsilateral Access Site Pain at 30 days [95% Confidence Interval][2]	18.0% (9/50) [8.6%, 31.4%]	28.0% (14/50) [16.2%, 42.5%]	-10.0% [-26.4%, 6.4%]	--
Time to Actual Hospital Discharge (hours) [95% Confidence Interval][1]	31.4 ± 16.9 (50) [26.6, 36.2]	45.7 ± 59.9 (48) [28.3, 63.1]	-14.3 [-32.3, 3.7]	--
Time to Ambulation (hours) [95% Confidence Interval][1]	17.8 ± 7.2 (50) [15.7, 19.9]	20.5 ± 16.9 (48) [15.6, 25.5]	-2.7 [-8.0, 2.5]	--
Ipsilateral Pain Scale Score at Pre-Discharge [95% Confidence Interval][1]	2.1 ± 2.2 (50) [1.5, 2.7]	2.6 ± 2.4 (49) [1.9, 3.3]	-0.5 [-1.4, 0.4]	--
Time to Hemostasis for Ipsilateral Access Site (minutes)[3] [95% Confidence Interval][2]	9.8 ± 17.0 (50) [5.0, 14.7]	22.7 ± 22.9 (47) [16.0, 29.4]	-12.9 [-21.1, -4.7]	--
Closure Device Success [95% Confidence Interval][2]	96.0% (48/50) [86.3%, 99.5%]	N/A	N/A	--
Access Site Closure Success	94.0% (47/50)	N/A	N/A	--

Endpoints	ProGlide N = 50	SEVAR N = 50	Difference (95% CI)[1]	Superiority Test p-value
[95% Confidence Interval][2]	[83.5%, 98.7%]			

[1] *By normal approximation*
[2] *By Clopper-Pearson exact confidence interval*
[3] *By two-sample t-test, pre-specified hypothesis test using hierarchical test procedure.*
[4] *By Fisher's Exact Test, pre-specified hypothesis test using hierarchical test procedure.*
[5] *A composite endpoint including minor Ipsilateral Access site vascular complications and narcotic analgesic use for ipsilateral access site pain at 30 days*
[6] *Insufficient sample size or small frequency in the numerator for the validity of normal approximation assumption*

4 Subgroup Analysis

Applicability to Pediatric Population

The ProGlide SMC device is not typically used to close a femoral artery access site in pediatric populations. Accordingly, the safety and effectiveness of the ProGlide SMC device in pediatric populations was not studied in the PEVAR trial.

PEVAR Results by Gender/Sex

There were a total of 8 females (8.0 %) and 92 males (92.0%) subjects enrolled in the PEVAR (ProGlide) and SEVAR arms of the PEVAR trial. The subgroup analysis for gender or ethnic groups was not performed due to the small sample size of the female patients. There were no pre-specified gender analysis or requirements set forth in the protocol; therefore, the information provided is for descriptive purposes only and no conclusions can be drawn based on gender.

5 Clinical Data from Roll-In Patients

There were 22 patients treated in the ProGlide roll-in phase of the PEVAR trial. The mean age of this treatment group was 71.1 ± 6.9 years. The major ipsilateral access site vascular complication rate was 4.5 % (1/22). The mean procedure time was 118.2 ± 43.4 minutes and the average time to hemostasis was 7.7 ± 6.8 minutes for the roll-in phase. Additionally, the device success rate and the access site closure success rate were both 95.5%. These results are comparable to those from the PEVAR (ProGlide) arm in the randomized study and support the safety and effectiveness of the ProGlide SMC device.

XI. PANEL MEETING RECOMMENDATION AND FDA'S POST-PANEL ACTION

In accordance with the provisions of section 515(c)(2) of the act as amended by the Safe Medical Devices Act of 1990, this PMA was not referred to the Circulatory System Devices Panel , an FDA advisory committee, for review and recommendation because the information in the PMA substantially duplicates information previously reviewed by this panel.

XII. CONCLUSIONS DRAWN FROM PRECLINICAL AND CLINICAL STUDIES

A. Effectiveness Conclusions

The ProGlide SMC device, using a pre-close technique, is non-inferior to the standard vascular surgical cutdown in the closure of femoral artery access sites up to 21F sheath size. The ProGlide SMC device can be used effectively used to close femoral artery access sites up to 21F sheath size. The 6-months follow-up showed that the effect.is sustained at that time frame. Additionally, use of the pre-close technique can result in shorter procedure time and shorter time to achieve hemostasis.

B. Safety Conclusions

The risks of the device are based on data collected in a clinical study conducted to support PMA approval as described above. There are several known risks associated with vascular closure devices intended to close large arteriotomies (up to 21 F), and they are those that were assessed by the primary endpoint of the study. This includes access site vascular injury, new onset of lower extremity ischemia, access site related bleeding, infection and nerve injury, as well as mild groin pain and small groin hematoma.

A patient may be subject to vascular access complications. The incidence and severity of these events is low compared with the complications associated with open surgical cutdown. In addition, when the use of this device fails to close the arteriotomy, a conventional open surgical cutdown can be performed to control bleeding and close the arteriotomy, which is considered standard of care. Of the 50 subjects who were treated with the ProGlide SMC, 6% experienced major ipsilateral access site vascular complications within 30 days compared with 10% of the 50 subjects who underwent surgical repair.

The majority of harmful events occurred peri-procedure and patients recovered over time. Most events that occur can be treated with standard medical therapies or with conventional surgical cutdown, and those harmful events all resolved by 30 days. The 6-months follow-up showed that no additional adverse events related to the closure device occurred.

Although the duration of the benefit achieved was not assessed as to value to patients in this clinical study, it is expected that patients will value such a benefit since the device achieved closure of the arteriotomy without serious complications. Therefore, their quality of life was not deterred.

C. Benefit-Risk Conclusions

The probable benefits and risks of the ProGlide SMC were assessed based on data collected in the PEVAR clinical study conducted to support PMA approval as described above.

The standard for closing a 21F arteriotomy is surgical cutdown. As shown in the PEVAR clinical trial, the cutdown technique is effective, but carries additional risks when compared to the purely percutaneous closure approach using the ProGlide SMC. Purely percutaneous access is perceived as less invasive than open surgical cutdown and it is as effective. The ProGlide SMC is unique because it is capable of being used to close up to 21F arteriotomies that are utilized in several types of less invasive interventions such as but not limited to: percutaneous repair of thoracic and abdominal aortic aneurysms (PTEVAR), balloon aortic valvuloplasty (BAV), and transcatheter aortic valve implantation (TAVI). Patients treated in the control group with surgical cutdown, experienced more major vascular access complications within 30 days than patients who received arterial closure using the ProGlide SMC.

A surgeon with femoral vascular access training must be present at the time of the intervention in case conversion to surgical cutdown is needed in order to mitigate or treat complications. There was a vascular surgeon present for all cases included in this clinical study. Physician training is necessary for closure of larger arteriotomies (up to 21F) using the ProGlide SMC.

D. Overall Conclusions

In conclusion, given the available information above, there is reasonable assurance of safety and effectiveness to support percutaneous delivery of sutures for closing the common femoral artery access site of patients who have undergone diagnostic or interventional catheterization procedures using 5F to 21F sheaths. For sheath sizes greater than 8F, at least two devices and the pre-close technique are required. In addition, based on the data from the PEVAR trial, the probable benefits outweigh the probable risks when using the ProGlide SMC as indicated.

XIII. CDRH DECISION

CDRH issued an approval order on April 15, 2013.

The applicant's manufacturing facilities were inspected and found to be in compliance with the device Quality System (QS) regulation (21 CFR 820).

XIV. APPROVAL SPECIFICATIONS

Directions for use: See device labeling.

Hazards to Health from Use of the Device: See Indications, Contraindications, Warnings, Precautions, and Adverse Events in the device labeling.

Post-approval Requirements and Restrictions: See approval order.