SUMMARY OF SAFETY AND EFFECTIVENESS DATA (SSED)

I. GENERAL INFORMATION

Device Generic Name:	Scaffold, Dissection Repair
Device Trade Name:	Tack Endovascular System® (4F, 1.5-4.5mm)
Device Procode:	QCT
Applicant's Name and Address:	Intact Vascular, Inc. 1285 Drummers Lane, #200 Wayne, PA 19087
Date of Panel Recommendation:	None
Premarket Approval Application (PMA) Number:	P190027
Date of FDA Notice of Approval:	April 10, 2020

II. INDICATIONS FOR USE

The Tack Endovascular System® (4F, 1.5-4.5mm) is intended for use in mid/distal popliteal, tibial and peroneal arteries ranging in diameter from 1.5 mm to 4.5 mm for the repair of post percutaneous transluminal balloon angioplasty (PTA) dissection(s).

III. CONTRAINDICATIONS

The Tack Endovascular System® (4F, 1.5-4.5mm) is contraindicated for the following:

1. Patients with residual stenosis in the treated segment equal to or greater than 30% after PTA.
2. Tortuous vascular anatomy significant enough to prevent safe introduction and passage of the device.
3. Patients with a known hypersensitivity to nickel-titanium alloy (Nitinol).
4. Patients unable to receive standard medication used for interventional procedures such as anticoagulants, contrast agents and antiplatelet therapy.

IV. WARNINGS AND PRECAUTIONS

The warnings and precautions can be found in the Instructions for Use for the Tack Endovascular System ® (4F, 1.5-4.5mm).

V. DEVICE DESCRIPTION

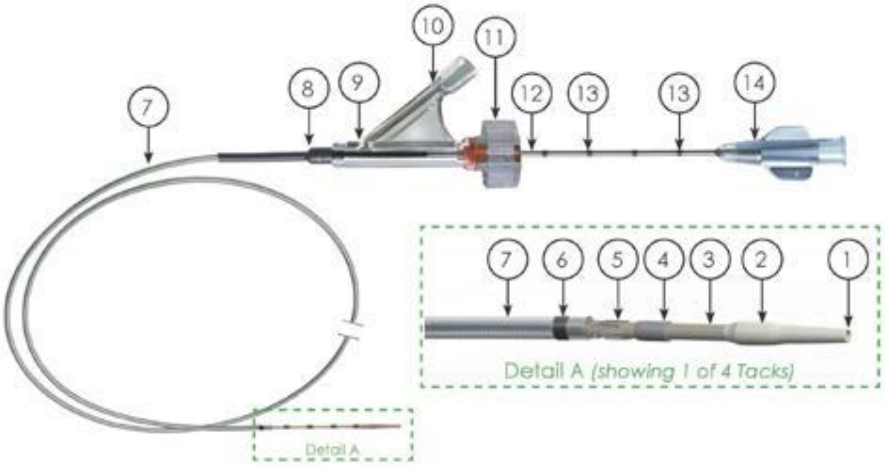
The Tack Endovascular System® (4F, 1.5-4.5mm) is designed to repair vascular dissections with Tack implant(s) following angioplasty in the mid/distal popliteal, tibial and peroneal arteries, ranging from 1.5mm to 4.5mm in diameter. The 4F (1.33mm) catheter contains 4 independent self-expanding Tack implants made of a nickel-titanium alloy (Nitinol). When deployed, the Tack implants are designed to repair acute dissections of the inner wall or lining of an artery by "tacking" the damaged tissue to the inner luminal surface through a low outward radial force.

The Tack Endovascular System® (4F, 1.5-4.5mm) consists of 4 self-expanding Nitinol implants and a 4F (1.33mm) Delivery Catheter (See **Figure 1**). The numbers in parentheses in the following section refer to those in **Figure 1**.

The Tack implants are approximately 6mm in length and expand to an unconstrained diameter of 5.7mm (See **Table 1**). The Tack implants are designed with a relatively flat chronic outward force curve and may be used across all reference vessel diameters (RVDs) ranging from 1.5 to 4.5mm. Four RO Markers (16) as well as four pairs of Anchors (17) are located around the centerline of each Tack implant. The anchors assist in maintaining proper Tack implant position.

The delivery catheter has effective lengths of 90cm and 150cm. The 4F Outer Braided Sheath (7), which constrains the Tack implants, is bonded proximally to the Bifurcation Luer (9) within the Strain Relief (8). The Hemostatic Valve (11) is integrated proximally to the Bifurcation Luer. The Inner Core Shaft (3) slides within the Hemostatic Valve and has five Proximal Inner Core Markers (13). The number of visible reference marks corresponds to the number of undeployed Tack implants remaining in the distal end of the delivery system. A soft, tapered Distal Tip (2) is bonded to the distal end of the Inner Core Shaft for ease of advancement in the blood vessel. Constrained within the Outer Braided Sheath, each self-expanding Tack implant is positioned on the Inner Core Shaft (3) between two radiopaque Distal Inner Core Markers (4) spaced approximately 7mm apart. A 1mm radiopaque Target Band (6) is located on the distal end of the Outer Braided Sheath.

The catheter is flushed prior to the procedure through the side port of the Bifurcation Luer and the Guidewire Port. Tack implant positioning is achieved prior to deployment by using as reference the Middle RO Markers on the Tack implant and the Target Band on the outer sheath. During Tack implant deployment; the Hemostatic Valve is unlocked by rotating the valve counter-clockwise. The Tack implants are individually unsheathed by pinning the Proximal Inner Core Shaft and pulling back on the outer sheath the distance between proximal inner core markers. After each deployment, the Hemostatic Valve is locked by rotating the valve clockwise, ensuring that the proximal edge of the Target Band is secured directly over a Distal Inner Core Marker. Between deployments, both the proximal inner core markers and the distal inner core markers serve to visually represent the number of remaining Tack implants in the delivery catheter.



1. Guidewire Lumen
2. Distal Tip
3. Inner Core Shaft
4. Distal Inner Core Marker
5. Crimped Tack
6. Target Band (Outer Sheath RO Marker)
7. Outer Braided Sheath
8. Strain Relief
9. Bifurcation Luer
10. Side port
11. Hemostatic Valve
12. Inner Core Shaft
13. Proximal Inner Core Markers
14. Guidewire Port
15. Unconstrained Tack
16. Middle RO Marker
17. Anchor

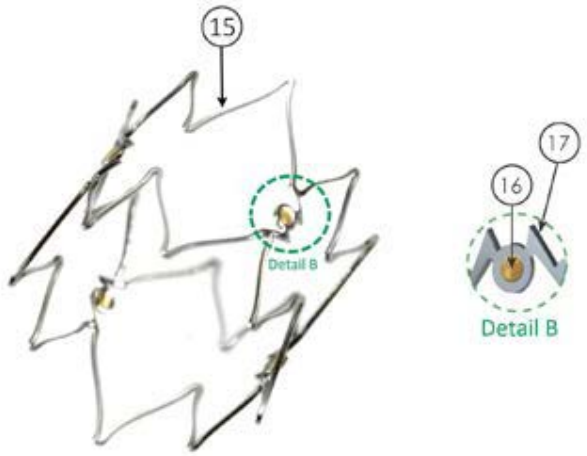


Figure 1. The Tack Endovascular System® (4F, 1.5-4.5mm)

Table 1. Tack Implant Length at Various Diameters	
Diameter	Length
1.1mm (Constrained implant)	6.50mm
1.5mm (Deployed implant)	6.48mm
4.5mm (Deployed implant)	6.24mm
5.7mm (Unconstrained implant)	5.90mm

VI. ALTERNATIVE PRACTICES AND PROCEDURES

In the United States, there are currently no approved devices specifically intended for dissection repair in peripheral arteries below the knee. As such, many dissections are left untreated, treated with extended PTA balloon inflation time, or treated with off-label stents.

VII. MARKETING HISTORY

In the European Union, the Tack Endovascular System® (4F, 1.5-4.5mm) was CE-marked in 2017 under Council Directive 93/42/EEC and has been used commercially since 2019. The device is currently commercially available in Austria, Germany, and Switzerland. The Tack Endovascular System® (4F, 1.5-4.5mm) has not been withdrawn from marketing for any reason related to its safety or effectiveness.

VIII. POTENTIAL ADVERSE EFFECTS OF THE DEVICE ON HEALTH

Below is a list of the potential adverse effects (e.g., complications) associated with the use of the device.

- Access failure or abrupt closure
- Allergic / anaphylactoid reaction to anticoagulant and/or antithrombotic therapy or contrast medium
- Allergic reaction to Nitinol
- Amputation of lower extremity
- Anemia
- Angina / coronary ischemia / myocardial infarction
- Arrhythmia
- Arterial occlusion / (re) stenosis / dissection / thrombus
- Arterial spasm
- Arteriovenous fistula
- Blue toe syndrome
- Claudication or rest pain, worsened
- Death
- Disseminated intravascular coagulation
- Embolism
- Emergent repeat hospital intervention
- Fever
- Gangrene
- Gastrointestinal bleed from anticoagulation / antiplatelet medication
- Hematoma / hemorrhage
- Hypotension / hypertension
- Inadvertent venipuncture
- Infection / abscess at insertion site / Cellulitis
- Inflammation

- Multi-organ failure
- Pain
- Pseudoaneurysm
- Renal insufficiency or failure
- Respiratory distress or failure
- Reperfusion pain
- Septicemia / bacteremia (sepsis)
- Swelling / Edema, peripheral
- Tachycardia
- Tack implant embolization
- Tack implant migration (device moves over time)
- Tack implant occlusion / restenosis
- Tissue necrosis
- Trauma to adjacent structures
- Stroke / TIA (hemorrhagic / embolic)
- Vascular complications which may require surgical repair

For the specific adverse events that occurred in the TOBA II BTK clinical study, please see Section X below.

IX. SUMMARY OF NONCLINICAL STUDIES

A. Engineering Bench Testing

In vitro bench testing to assess the safety and effectiveness of the Tack Endovascular System® (4F, 1.5-4.5mm) was conducted based on IVI's Quality System design control requirements and is consistent with FDA Guidance, *Non-Clinical Engineering Tests and Recommended Labeling for Intravascular Stents and Associated Delivery Systems, April 18, 2010* and *Select Updates for Non-Clinical Engineering Tests and Recommended Labeling for Intravascular Stents and Associated Delivery Systems, August 15, 2015*. The relevant *in vitro* tests outlined in the guidance document and included in support of the Tack Endovascular System® (4F, 1.5-4.5mm) are summarized in **Table 2**. Unless otherwise specified, all test units were 2x sterilized using a validated Ethylene Oxide sterilization process.

Table 2. Summary of Bench Testing of the Tack Endovascular System® (4F, 1.5-4.5mm)

Test	Purpose	Acceptance Criteria	Results
Material Characterization			
Material Composition (Tack implant)	To verify that the Tack implant materials conform to the chemical composition requirements of *ASTM F2063 (nitinol)*, and *ASTM B562 (gold)*	The Tack implant materials (nitinol and gold) must meet *ASTM F2063* and *ASTM B562* specifications.	Pass

Table 2. Summary of Bench Testing of the Tack Endovascular System® (4F, 1.5-4.5mm)

Test	Purpose	Acceptance Criteria	Results
Material Composition (Delivery Systems)	To verify the material composition of the delivery system	All materials and components must meet specifications	Pass
Shape Memory & Elasticity	To verify the transition temperature of the nitinol	The Af temperature shall be between 14-24ºC	Pass
Corrosion Resistance	To evaluate the susceptibility of the Tack implant material to corrosion, including pitting and crevice, fretting for overlapped Tack implants, and galvanic corrosion for Tacks of dissimilar materials. (Nitinol and gold.)	Fretting Corrosion Any fretting corrosion mass loss that may result in Nickel release shall be less than the Permitted Daily Dose (PDD) derived from the ICH Guideline Q3D: Guideline for Elemental Impurities	Pass
		Pitting and Crevice Corrosion Implant shall be tested for resistance to corrosion following fatigue cycling per ASTM F2129. The Implant shall have a breakdown potential ≥ 600mV.	Pass
		Galvanic corrosion The corrosion mass-loss rate for the test specimen implants shall be less than 116µg of Nitinol released per day per device.	Pass
Tack implant Dimensional and Functional Attributes			
Diameter & Length Verification	To verify the Tack implant dimensions post-deployment	The diameter and length should meet the labeled specifications.	The acceptance criteria were met.
Percent Surface Area	To determine the Tack implant surface area that contacts the vessel	The percent surface area was calculated for characterization only based on product drawings.	The percent surface area in the minimum 1.5mm RVD is 28.6%. The percent surface area in the maximum 4.5mm RVD is 9.9%.
Foreshortening	To report the decrease in length of the Tack implant between the catheter-loaded condition and the deployed diameter	Foreshortening was determined for characterization only	<table><tr><th>Diameter</th><th>Length (mm)</th></tr><tr><td>1.1 mm (Constrained implant)</td><td>6.50</td></tr><tr><td>1.5 mm (Deployed implant)</td><td>6.48</td></tr><tr><td>4.5 mm (Deployed implant)</td><td>6.24</td></tr><tr><td>5.7 mm (Unconstrained implant)</td><td>5.90</td></tr></table>
Tack Implant Integrity	To report any defects on the deployed Tack implant	No Tack implant should demonstrate damage (cracks, broken struts, gouges or dents) or permanent set.	The acceptance criteria were met.

Table 2. Summary of Bench Testing of the Tack Endovascular System® (4F, 1.5-4.5mm)			
Test	**Purpose**	**Acceptance Criteria**	**Results**
Radial Outward Force	To characterize the radial outward force of self-expanding stents	Implant shall have a maximum radial force of 3 Newtons (N)	The acceptance criteria were met.
Mechanical Properties	To specify mechanical properties of the Tack implant material pre and post- processing.	Raw materials must meet incoming acceptance specifications. Post processing study was for characterization purposes.	Mechanical properties of the raw materials met specifications.
Stress/Strain and Fatigue Analysis	To characterize the stress/strains that the Tack implant will experience within the intended vasculature to support fatigue analysis To evaluate the device durability based on results of the stress and strain analysis	The safety factor determined by the fatigue analysis must be equal to or greater than 1.0 for all fatigue loads.	The acceptance criterion was met
Accelerated Durability Testing	To evaluate Tack implant structural durability under physiologically relevant loading conditions, including radial pulsatile, axial compression, bending, torsional and crush loads.	The Tack implant must maintain structural integrity over a 10-year equivalent in vitro loading, simulating arterial conditions within the indicated range. No strut fracture after 400 million cycles.	The acceptance criterion was met.
MRI Safety & Compatibility	To evaluate MRI safety and compatibility of the Tack implant	For characterization purposes only, the conditions under which the device can be safely scanned are provided in the product labeling.	The implanted single and overlapped Tack implants were determined to be "MR Conditional" to 1.5 and 3 Tesla.
Radiopacity	To evaluate the radiopacity of the Tack implant	The delivery system and Tack implant must be visible under fluoroscopy.	The radiopaque design features of both the delivery system and the implantable Tack were adequate for base-line delivery, deployment and identification under fluoroscopy
Crush Resistance	To demonstrate the ability of the Tack implant to recover its desired size and shape after application and removal of external loads, deformations, or both.	Following an acute crush event and load release, the Tack implant diameter must meet diametrical specification	The acceptance criterion was met.
Delivery System Dimensional and Functional Attributes			
Dimensional Verification	To verify the key dimensions of the delivery system	The delivery system must meet the relevant design specifications.	The acceptance criteria were met

Table 2. Summary of Bench Testing of the Tack Endovascular System® (4F, 1.5-4.5mm)			
Test	**Purpose**	**Acceptance Criteria**	**Results**
Delivery, Deployment, and Retraction	To demonstrate that the delivery catheter can safely and reliably deliver the Tack implants to the intended location without adversely affecting the Tack implants by the delivery catheter during deployment and withdrawal.	The Tack implants must be able to be delivered to the target zone with no anomalies or Tack implant damage upon deployment and delivery system withdrawal.	The acceptance criteria were met
Catheter Bond Strength	To verify the bond strength of the delivery system bond joints for the intended use.	The delivery system bonds must maintain integrity above the specified load, Various acceptance criteria were specified for outer sheath bonds, and support member and tip.	The acceptance criteria were met
Tip Pull Test	To determine the tensile force that will separate the distal tip from the catheter.		
Flexibility & Kink Test	To verify that the Tack implant delivery system will not kink at a worst-case bend radius that is appropriate for the intended anatomy	The delivery system must not kink when bent around at worst case curvature.	The acceptance criterion was met
Torque Strength	To evaluate the torque strength of the Tack implant delivery system when the distal tip is not free to rotate.	With the distal tip fixed and unable to rotate, the delivery system must withstand a minimum number of rotations before exhibiting failure.	The acceptance criterion was met
Coating Integrity/ Particulate Evaluation	To measure the total number and size of the particulates generated during simulated Tack implant delivery and deployment	Characterization Study	N/A

B. Biocompatibility

Biocompatibility testing was performed in accordance with applicable Good Laboratory Practices (21 CFR 58) and ISO 10993-1 - Biological Evaluation of Medical Devices. All testing was conducted on 2x sterilized product. For biocompatibility testing, the Tack implant portion of the system was classified as an implant device in permanent contact (>30 days) with blood. The Tack implant delivery system was classified as external communicating device, in limited contact (< 24 hours) with circulating blood. **Table 3** summarizes the biocompatibility testing conducted on devices representative of the final design.

Table 3. Biocompatibility Testing Summary on the Tack Endovascular System® (4F, 1.5-4.5mm)				
Biologic Effect	**Test Name / Description**	**Tack**	**Delivery System**	**Results**
Cytotoxicity	ISO MEM Elution Assay w/ L-929 Mouse Fibroblast Cells	√	√	Non-toxic
Sensitization	ISO Guinea Pig Maximization Sensitization Test Extract	√	√	Non-Sensitizing

Table 3. Biocompatibility Testing Summary on the Tack Endovascular System® (4F, 1.5-4.5mm)				
Biologic Effect	**Test Name / Description**	**Tack**	**Delivery System**	**Results**
Irritation / Intracutaneous Reactivity	ISO Intracutaneous Reactivity Test	√	√	Non-irritating
Systemic Toxicity (acute)	ISO Acute Systemic Injection Test	√	√	No evidence of systemic toxicity
Pyrogenicity	USP Rabbit Pyrogen Study, Material Mediated	√	√	Non-pyrogenic
Genotoxicity	ISO Bacterial Mutagenicity Test – AMES Assay	√	√	Non-mutagenic
Hemocompatibility	ASTM Hemolysis (Direct and Indirect Contact) Assay	√	√	Non-hemolytic
	Complement Activation (C3a & SC5b-9 Assay)	√	√	Non-activating
	In Vivo Thromboresistance Study in the Canine Jugular Vein	N/A	√	Tack implant: Thrombogenicity was assessed in the in vivo animal studies described in Section E and leveraged for new supplier based on comparative chemistry and surface morphology. Delivery System: In the absence of anticoagulation, there were moderate levels of thrombus observed in some test articles and controls in the canine study. However, no thromboembolic events were observed during the TOBA II BTK clinical study (n=233 patients).

Chemical characterization and a toxicological risk assessment were conducted to address the endpoints of sub-chronic/chronic systemic toxicity, genotoxicity, and carcinogenicity.

C. Sterilization

The Tack Endovascular System® (4F, 1.5-4.5mm) is sterilized in compliance with ISO 11135-1 – Sterilization of Healthcare Products – Ethylene oxide – Requirements for the development, validation and routine control of a sterilization process for medical devices. Routine testing of biological indicators is performed to confirm that the sterilization process is effective in eradicating viable microorganisms. Results from sterilization studies demonstrate that the Tack Endovascular System® (4F, 1.5-4.5mm) will maintain a Sterility Assurance Level (SAL) of 10^{-6}.

D. Packaging and Shelf Life

Packaging qualification testing (visual inspection, package integrity (bubble leak/dye penetration), and seal strength testing) demonstrated the ability of the packaging to protect the product and maintain a sterile barrier through shipping and shelf life. The

Tack Endovascular System® (4F, 1.5-4.5mm) is packaged in a preformed tray, sealed in two packaging pouches and placed in a folding carton. A shelf life of 2 years has been established for the Tack Endovascular System® (4F, 1.5-4.5mm) based on product and package shelf life testing.

E. *In Vivo* Animal Studies

A non-GLP Acute Porcine Animal Study was performed to verify the functionality and radiopacity of the Tack Endovascular System® (4F, 1.5-4.5mm) when deployed in the peripheral arteries of a porcine model. Additionally, a series of sub-chronic and chronic animal studies that support the safety and feasibility of the similar Tack Endovascular System® (6F, 4.0-8.0mm) were leveraged for the Tack Endovascular System® (4F, 1.5-4.5mm). The preclinical animal studies primarily focused on the inflammatory response, procedural techniques and the overall safety of the device *in vivo* in porcine models. The results of these animal studies demonstrated that the Tack implants produce minimal injury, inflammation, and neointimal hyperplasia following implantation in porcine arteries. **Table 4** summarizes the results of the GLP studies conducted on devices representative of the final device design, including the 4F and 6F versions of the device.

Table 4. Animal Study Summary

Title / Device	Methods/Description	Results
Non-GLP Acute Porcine Animal – Tack Endovascular System® (4F, 1.5-4.5mm)	Verified the functionality and radiopacity of the Tack Endovascular System® (4F, 1.5-4.5mm) when deployed in the peripheral arteries of a porcine model.	The Tack Endovascular System® (4F, 1.5-4.5mm) met the predefined acceptance criteria for guidewire compatibility, introducer sheath compatibility, atraumatic tip, delivery catheter flexibility, tack and delivery catheter radiopacity and delivery system retraction.
Comparison to control stent – Tack Endovascular System® (6F, 4.0-8.0mm)	• 16 Yucatan mini swine. • 72 Tack implants, 14 control stents placed in femoral arteries. • 10/16 – survived 28 days, each with 4 Tacks and 1 control stent placed contralaterally. • 4/16 – survived 90 days, each with 4 Tacks and 1 control stent placed contralaterally. • 2/16 – survived 90 days, 4 Tacks placed bilaterally.	• @ 28 days – nearly complete healing and endothelialization of Tack implants only. • @ 90 days – nearly complete healing and endothelialization for both the Tack implant and control stent. • Histopathology showed less neointimal response, lower stenosis, and lower injury scores for the Tack implants.
Tack Spacing Study I – Tack Endovascular System® (6F, 4.0-8.0mm)	• 3 domestic Yorkshire swine. • 60 Tack implants placed in superficial femoral and profunda arteries. • 90-day survival.	• Tack implants spaced 2±2mm or at 8±2mm. • @ 90 days there was evidence of malapposed struts and strut fractures within 7/60 Tack implants.

		• Fractures were most likely caused by 75% weight increase in animals used for the study and implantation in the profunda. • Tack implants performed well and had nearly complete endothelialization and minimal neointimal response.
Tack Spacing Study II – Tack Endovascular System® (6F, 4.0-8.0mm)	• 3 Yucatan mini swine. • 60 Tack implants placed in superficial femoral and profunda arteries. • 90-day survival.	• Tack implants spaced 2±2mm or at 8±2mm. • @ 90 days - evidence of malapposed struts but no strut fractures in any Tack implants. • Tacks had nearly complete endothelialization and minimal neointimal response both when spaced closely together and further apart.

X. SUMMARY OF PRIMARY CLINICAL STUDY

The applicant performed the TOBA II BTK pivotal study to establish a reasonable assurance of safety and effectiveness of the Tack Endovascular System® (4F, 1.5-4.5mm) in the repair of post-PTA dissections in the mid/distal popliteal, tibial and peroneal arteries in the United States, Europe and New Zealand under IDE # G160144. Data from this clinical study were the basis for the PMA approval decision. A summary of the clinical study is presented below.

A. TOBA II BTK Study Design

The prospective, multi-center, single-arm, non-blinded TOBA II BTK study investigated the safety and efficacy of the Tack Endovascular System® (4F, 1.5-4.5mm) for the repair of dissection(s) type(s) A through F resulting from percutaneous transluminal balloon angioplasty (PTA) in the mid/distal popliteal, tibial and peroneal arteries. Patients were treated between February 8, 2017 and December 26, 2018. The original database for this PMA reflected data collected through August 28, 2019 and the study enrolled 233 subjects at 41 clinical sites. Additionally, FDA requested a post-hoc analysis of all available 12-month follow-up data. The post-hoc 12-month analysis reflected data collected from 151 subjects through December 15, 2019.

The primary objectives of this study were to demonstrate the following outcomes:

- Safety: Major adverse limb events (MALE) plus perioperative death (POD) at 30 days defined as a composite of all-cause death, above-ankle target limb amputation, or major re-intervention to the target lesion(s) (defined as new

bypass graft, jump/interposition graft revision, or thrombectomy /thrombolysis).

- Effectiveness: Freedom from MALE at 6 months + POD at 30 days.

These endpoints were evaluated against performance goals (PGs), as described below. The primary statistical method was a two-sided, single-group, exact binomial test comparing the observed proportion of subjects with MALE plus POD at 30 days, and subjects free of MALE at 6 months plus POD at 30 days to the respective (PG). The p-value associated with the test was determined along with a two-sided 95% lower confidence bound on the point estimate observed.

An independent Clinical Events Committee (CEC) consisting of a team of clinical experts with experience in the conduct of clinical trials was formed to review clinical events reported by the investigators, or at the request of the Sponsor to determine if they met the prespecified endpoint definitions. Additionally, an independent board of multi-disciplinary physicians and subject matter experts was convened to serve as the Data Safety and Monitoring Board (DSMB) for the study. All study-related angiographic, duplex ultrasound (DUS) and X-ray imaging were reviewed and analyzed by independent core laboratories.

1. TOBA II BTK Inclusion and Exclusion Criteria

Subjects enrolled in the TOBA II BTK study were required to meet ALL of the following inclusion criteria prior to enrollment:

1. Male or non-pregnant Female ≥18 years of age at the time of consent
2. Female subjects of childbearing potential must have had a negative pregnancy test prior to treatment and must use some form of contraception (abstinence is acceptable) through the duration of the study
3. Subject was informed of and understood the nature of the study and provided signed informed consent to participate in the study. If the subject possessed the ability to understand and provide informed consent but due to physical inability, the subject could not sign the ICF, an impartial witness could sign on behalf of the subject
4. Was willing to comply with all required follow-up visits
5. Wound, Ischemia, and foot Infection (WIfI) Wound grade of 0, 1 or modified 2
6. WIfI Foot Infection grade of 0 or 1
7. Rutherford Classification 4 or 5
8. Estimated life expectancy was >1 year

Subjects were to be excluded from the TOBA II BTK study if they met ANY of the following exclusion criteria:

1. Was pregnant or refused to use contraception through the duration of the study
2. Previous bypass graft in the target limb
3. Acute limb ischemia, defined as symptom onset occurring less than 14 days prior to the index procedure
4. Prior or planned above-ankle amputation or complete transmetatarsal amputation to the target limb (this did not apply to ray amputation of ≤2 digits, simple digital amputations or ulcer debridements)
5. WIfI Foot Infection grade 2 or 3
6. Any systemic infection or immunocompromised state. Patients that had an ascending infection/deep foot infection or abscess/white blood count (WBC)≥12,000/or febrile state
7. Endovascular or surgical procedure (not including diagnostic procedures, planned simple digital amputation or wound debridement) to the target limb less than 30 days prior to or planned for less than 30 days after the index procedure
8. Existing stent implant in the target vessel
9. Any other endovascular or surgical procedure (not including diagnostic procedures, planned simple digital amputation or wound debridement) less than 14 days prior to the index procedure or planned procedure less than 30 days after the index procedure
10. Known coagulopathy, hypercoagulable state, bleeding diathesis, other blood disorder, or a platelet count less than 80,000/microliter or greater than 500,000/microliter
11. WIfI Wound grade of 2 or 3
12. Antiplatelet, anticoagulant, or thrombolytic therapy was contraindicated
13. Myocardial infarction, coronary thrombolysis or angina less than 30 days prior to the Index Procedure
14. History of stroke or transient ischemic attack (TIA) less than 90 days prior to the Index Procedure
15. Currently on dialysis
16. Known hypersensitivity or contraindication to nickel titanium alloy (Nitinol)
17. Participating in another ongoing investigational clinical trial that had not completed its primary endpoint

18. Had other comorbidities that, in the opinion of the investigator, would preclude them from receiving this treatment and/or participating in study-required follow-up assessments
19. Known hypersensitivity or allergy to contrast agents that could not be medically managed
20. Subject was already enrolled into this study
21. Restenotic target lesion previously treated by means other than plain balloon angioplasty and/or less than 1 year prior to index procedure

2. Patient Follow-up Schedule

After hospital discharge, subjects were required to return to the study center for clinical assessments on Day 30 (-2 days/+14 Days), 6 months ± 30 days, 12 months ± 30 days, 24 months ± 30 days and 36 months ± 30 days. Adverse events and complications were recorded at all visits. A time and events schedule for all assessments is provided in **Table 5** below.

Table 5. Time and Events Schedule

Assessment	Baseline	Index Procedure	Pre-Discharge	30-day (-2 days/+14 Days)	6 Month (±30 Days)	12 Month (± 30 Days)	24 Month (± 30 Days)	36 Month (± 30 Days)	Unscheduled
Informed Consent	X								
Medical History / Brief Physical	X								
White Blood Count / Platelet Count	X								
Prothrombin Time (PT) / International Normalized Ratio (INR)	X								
Urine pregnancy test if female	X								
Ankle Brachial Index (ABI)/ Toe Brachial Index (TBI)	X			X	X	X	X	X	X
$TcPO_2$	X			X	X	X	X	X	X
Rutherford Classification	X			X	X	X	X	X	X
WIfI Classification	X			X	X	X	X	X	X
Wound Assessment	X			X	X	X	X	X	X
Pre-procedural Medications		X							
Angiogram		X							X
Study Medications	X	X	X	X	X	X	X	X	X
Duplex Ultrasound (DUS)				X	X	X			X
X-ray of Implanted Tacks						X			X
Adverse Event (AE) Assessment		X	X	X	X	X	X	X	X
EQ-5D-3L	X			X	X	X	X	X	X

Table 5. Time and Events Schedule									
Assessment	**Baseline**	**Index Procedure**	**Pre-Discharge**	**30-day (-2 days/+14 Days)**	**6 Month (±30 Days)**	**12 Month (± 30 Days)**	**24 Month (± 30 Days)**	**36 Month (± 30 Days)**	**Unscheduled**
Walking Impairment Questionnaire (WIQ)	X			X	X	X	X	X	X

3. Clinical Endpoints

Primary Safety Endpoint

With regard to safety, the primary endpoint was MALE plus POD at 30 days defined as a composite of all-cause death, above-ankle target limb amputation, or major re-intervention to the target lesion(s). The performance goal for this endpoint was set at 12% based on the information reported by Conte (2009)[1]. The primary statistical analysis was conducted in subjects who met the intent-to-treat (ITT) definition and have observed data for the primary safety endpoint. A subject was considered an ITT patient and officially enrolled in the study once the Tack Endovascular System® (4F, 1.5-4.5mm) was advanced through the introducer sheath. A per protocol (PP) analysis was also performed and included a subset of the ITT population with evaluable data that met the definition for device success, excluding subjects with major protocol deviations such as a major inclusion / exclusion criterion violation; or major procedural deviation. For safety, the primary statistical method was a one-sample exact test comparing the proportion of subjects free from a MALE plus POD to the performance goal using a two-sided $\alpha = 0.025$. The exact two-sided 95% confidence interval for the proportion of subjects free from MALE plus POD was calculated.

Primary Effectiveness Endpoint

With regard to effectiveness, the primary endpoint was freedom from MALE at 6 months plus POD at 30 days. The performance goal for this endpoint is 74%, which was also derived from the information reported in Conte (2009). To meet the study primary endpoint, the two-sided lower 95% confidence interval must be greater than or equal to the performance goal of 74%.

Secondary Endpoints

A secondary endpoint of target lesion(s) tacked segment(s) patency at 6 months was defined as the presence of blood flow using duplex ultrasound. If angiography was

[1] Conte MS, Geraghty PJ, Bradbury AW, Hevelone ND, Lipsitz SR, Moneta GL, Nehler MR, Powell RJ, Sidawy AN. Suggested objective performance goals and clinical trial design for evaluating catheter-based treatment of critical limb ischemia. J Vasc Surg. 2009;50:1462-73.

available within the 6-month follow-up visit window, it was used in place of the duplex ultrasound. Evidence of no blood flow within the Tacked segment indicated restenosis/loss of patency. This secondary endpoint was formally tested against a performance goal of 64%. The performance goal of 64% was chosen as a result of a meta-analysis combining 13 papers that reported 6-month patency for standard PTA or from which the 6-month patency rate could be derived. A two-sided lower 95% confidence bound was calculated for this estimate using the continuity corrected standard normal approximation. The lower bound was compared to the performance goal of 64%.

An additional secondary endpoint of Target Limb Salvage, defined as freedom from any above-ankle target limb amputation at 6 months, was also collected.

Observational Endpoints

Observational endpoints include the following:

- Device Success - Successful deployment of the Tack implant(s) at the intended target site(s) and successful withdrawal of the delivery catheter from the introducer sheath.
- Target Lesion Success: Demonstrated target lesion patency [<30% residual diameter stenosis (DS), by visual estimate] without the use of a bailout stent within the target lesion upon completion of the index procedure. This will be assessed for all lesions treated with a Tack implant. In addition, target lesion success will also be analyzed by lack of bailout stent to tacked segment only. Multiple target lesions treated as one lesion with PTA will be analyzed as one lesion.
- Procedural Success: Demonstrated target lesion patency (<30% residual DS, by visual estimate) without the use of a bailout stent within the target lesion and without the occurrence of MALE+POD upon completion of the index procedure.
- Amputation-free survival (AFS): Freedom from above-ankle target limb amputation or all-cause death at 6 months.
- Assisted primary target lesion Tacked segment patency (flow vs. no flow) at 6 months.
- Secondary target lesion Tacked segment patency (flow vs. no flow) at 6 months.
- PSVR patency at 6 months [Freedom from binary restenosis defined as Peak Systolic Velocity Ratio (PSVR) of ≥ 2.5 and/or angiographic percent diameter stenosis of ≥50%] assessed for the following:

- Target Lesion(s), defined as the entire contiguous arterial segment treated with angioplasty, inclusive of an additional proximal and distal margin of 5 mm.
- Tacked Segment(s), defined as the Tack device and 5 mm of artery proximal and distal to each Tack. If Tacks are within 10 mm of each other, they will be considered as a single tacked segment for the purposes of this patency assessment.

- Clinically-driven target lesion revascularization (CD-TLR) through 6 months.
- Clinically-driven target vessel revascularization (CD-TVR) through 6 months.
- All-cause death through 6 months.
- Any Target vessel revascularization (TVR) through 6 months.
- Any Target lesion revascularization (TLR) through 6 months.

In addition, the following observational endpoints were assessed at various time points through 36 months:

- Changes in Wound, Ischemia, and foot Infection (WIfI) Classification
- Changes in ankle brachial index (ABI) and toe brachial index (TBI)
- Changes in Rutherford Classification
- Changes in the EQ-5D-3L quality of life questionnaire
- Changes in the Walking Impairment Questionnaire (WIQ)
- Tack implant integrity via X-ray (performed at 12-month visit)
- Progress of wound(s) present at study entry (healed, improved, unchanged, worsening, amputated)
- Appearance of new wound(s) after study entry
- Unplanned below-ankle target limb amputation(s): digit or transmetatarsal

B. Accountability of PMA Cohort

At the time of database lock, of 233 patients enrolled in the PMA study, 88.0% (205) patients were available for analysis at the completion of the study, the 6 month post-operative visit. Additionally, FDA requested a post-hoc analysis of all available 12-month data. The post-hoc analysis consists of data collected from 64.8% (151) patients

through December 15, 2019. A summary of subject accountability is provided in **Figure 2** below. A total of 14 subjects exited the study prior to the 6 month primary effectiveness endpoint analysis due to patient death (n=9), withdrawn consent (n=4), or investigator decision (n=1).

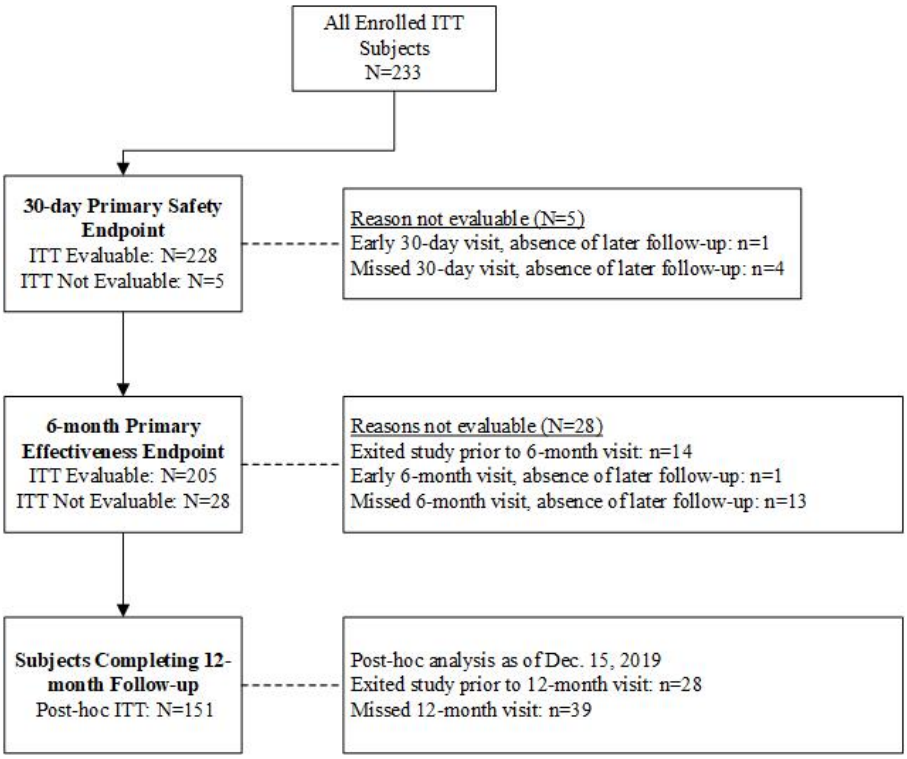


Figure 2. TOBA II BTK Subject Accountability

C. Study Population Demographics and Baseline Parameters

The TOBA II BTK population demographics, medical history and risk factors are summarized in **Tables 6-7**, below. The enrolled subjects were typical of a patient group undergoing endovascular treatment.

Table 6 Demographics and Baseline Characteristics	
Parameter	**Mean ±SD (N) (Min, Median, Max) or % (n/N)**
	ITT Subjects
Age at baseline (years)	74.4 ± 10.0 (233) (48.0, 75.0, 95.0)
Gender	
Male	67.4% (157/233)
Female	32.6% (76/233)
Ethnicity	
Hispanic or Latino	9.1% (21/230)
Not Hispanic or Latino	90.0% (207/230)
Unknown	0.0% (0/230)

Table 6 Demographics and Baseline Characteristics	
Parameter	**Mean ±SD (N) (Min, Median, Max) or % (n/N)**
	ITT Subjects
Decline to answer	0.9% (2/230)
Race (Check all that apply)	
American Indian or Alaska Native	0.4% (1/233)
Asian	1.3% (3/233)
Black or African American	16.7% (39/233)
Native Hawaiian or Pacific Islander	0.0% (0/233)
White	80.3% (187/233)
Other	0.0% (0/233)
Unknown	0.4% (1/233)
Decline to answer	0.9% (2/233)
BMI	28.8 ± 5.6 (231) (16.4, 28.6, 56.9)
BMI >= 30	37.2% (86/231)
ABI in treated limb[1]	0.74 ± 0.27 (198) (0.00, 0.75, 1.29)
TBI in treated limb	0.43 ± 0.23 (117) (0.00, 0.41, 1.48)
Rutherford Classification	
0	0.0% (0/233)
1	0.0% (0/233)
2	0.0% (0/233)
3	16.3% (38/233)
4	33.5% (78/233)
5	50.2% (117/233)
6	0.0% (0/233)
Wound Grade	
0	52.4% (122/233)
1	39.1% (91/233)
modified 2	8.6% (20/233)
2	0.0% (0/233)
3	0.0% (0/233)
Ischemia Grade	
0	52.0% (115/221)
1	24.9% (55/221)
2	12.7% (28/221)
3	10.4% (23/221)
Foot Infection Grade	
0	83.3% (194/233)
1	16.7% (39/233)
2	0.0% (0/233)
3	0.0% (0/233)
[1] Values ≥1.3 are censored as non-compressible.	

A summary of the medical history for all subjects is provided in **Table 7** below. The subjects presented with a host of comorbidities with the most common being arterial

hypertension (93.6%) and hyperlipidemia (78.0%). In addition, 65.7% were diabetic and 56.1% had coronary artery disease. Previous peripheral interventions occurred in 50.2% of subjects.

Table 7 Medical History and Risk Factors	
	Mean ±SD (N) (Min, Median, Max) or % (n/N)
Parameter	**ITT Subjects**
Coronary Artery Disease	56.1% (129/230)
Myocardial Infarction	22.0% (51/232)
Coronary revascularization	43.9% (101/230)
Coronary Artery Bypass Graft (CABG)	18.9% (44/233)
Percutaneous Coronary Intervention (PCI)	31.3% (73/233)
History of Thrombolysis	0.9% (2/233)
Chronic angina pectoris	5.6% (13/232)
Congestive heart failure	15.1% (35/232)
Cerebrovascular event	21.6% (50/231)
Transient Ischemic Attack (TIA)	6.0% (14/233)
Stroke – Cerebrovascular Accident (CVA)	16.7% (39/233)
Gastrointestinal / genitourinary bleeding	3.4% (8/232)
Chronic renal insufficiency	24.1% (56/232)
On dialysis	0.4% (1/233)
Coagulopathy, hypercoagulable state, bleeding diathesis, or other blood disorder	0.9% (2/232)
Smoking	
Current	17.2% (40/233)
Former	45.1% (105/233)
Never	37.8% (88/233)
Diabetes mellitus	65.7% (153/233)
Type I	4.6% (7/153)
Type II	95.4% (146/153)
Arterial hypertension	93.6% (218/233)
Controlled with medication	99.5% (217/218)
Not controlled with medication	0.5% (1/218)
Hyperlipidemia	78.0% (181/232)
Controlled with medication	93.9% (170/181)
Not controlled with medication	6.1% (11/181)
Family history of premature atherosclerotic disease (e.g., MI, CABG, PCI before age 60)	18.2% (29/159)
History of previous peripheral artery intervention on either limb	50.2% (117/233)

Baseline lesion and vessel assessments are summarized in **Table 8** below. The majority (93.8%) of lesions were de novo lesions. By core lab assessment, 64.9% of lesions were in the tibial artery or the tibial peroneal trunk. The core laboratory measured mean target lesion and injured lesion lengths were 80 ± 49 mm and 154 ± 100 mm, respectively. The mean pre-procedure target lesion percent diameter stenosis was 85%. The rate of total occlusions at baseline was 47.6%. Calcification at grades higher than mild were reported in 35.8% (18.1% moderate; 17.7% severe) of subjects.

Table 8 Baseline Angiogram		
	ITT Subjects Mean ±SD (N) (Min, Median, Max) or % (n/N)	
Parameter	**Investigator Reported**	**Core Lab Adjudicated**
LESION LEVEL VARIABLES		
Most proximal target lesion location		
Mid Popliteal	4.7% (13/277)	12.1% (30/248)
Distal Popliteal	10.5% (29/277)	12.1% (30/248)
Anterior Tibial	36.5% (101/277)	33.5% (83/248)
Posterior Tibial	16.2% (45/277)	13.3% (33/248)
Tibioperoneal Trunk	17.0% (47/277)	18.1% (45/248)
Peroneal	15.2% (42/277)	10.9% (27/248)
Other	0.0% (0/277)	0.0% (0/248)
Most distal target lesion location		
Mid Popliteal	0.7% (2/277)	4.0% (10/248)
Distal Popliteal	5.4% (15/277)	1.2% (3/248)
Anterior Tibial	41.2% (114/277)	41.1% (102/248)
Posterior Tibial	23.1% (64/277)	22.6% (56/248)
Tibioperoneal Trunk	7.2% (20/277)	10.1% (25/248)
Peroneal	22.0% (61/277)	21.0% (52/248)
Other	0.4% (1/277)	0.0% (0/248)
Target lesion length	116 ± 100 (277) (3, 76, 400)	80 ± 49 (248) (8, 71, 237)
Injured lesion length (per Core Lab)	-	154 ± 110 (238) (13, 120, 438)
Lesion type		
DeNovo	93.8% (257/274)	-
Restenotic	6.2% (17/274)	-
Proximal reference vessel diameter (mm)	3.1 ± 0.7 (276) (1.8, 3.0, 4.5)	3.5 ± 1.0 (248) (1.7, 3.3, 8.1)
Distal reference vessel diameter (mm)	2.8 ± 0.6 (276) (1.5, 3.0, 4.5)	2.6 ± 0.7 (248) (1.2, 2.5, 5.5)
Baseline target lesion percent diameter stenosis (%)	91 ± 10 (277) (70, 95, 100)	85 ± 17 (248) (31, 92, 100)
Total Occlusion	39.0% (108/277)	47.6% (118/248)
Calcification		
None / Mild	50.4% (139/276)	64.1% (159/248)
Moderate	43.1% (119/276)	18.1% (45/248)
Severe	6.5% (18/276)	17.7% (44/248)

D. Safety and Effectiveness Results

1. Safety Results

Primary Safety Endpoint

The primary safety endpoint was MALE (defined as a composite of all-cause death, above-ankle target limb amputation, or major re-intervention to the target lesion(s)) plus perioperative death (POD) at 30 days. The primary safety endpoint was MET. Three (1.3%) MALE events (two above the ankle amputations and one subject death) were reported in the first 30 days. The upper two-sided 95% confidence interval was 3.8% versus the PG of 12% ($p<0.0001$). See **Table 9** below.

Table 9 Primary Safety endpoint at 30 days

Event Type	ITT or PP	% (n/N) (CI)[1]	Performance Goal	p-value[1]	Study Endpoint
MALE + POD at 30 Days	ITT	1.3% (3/228)[2]	12%	<.0001	MET
[CI]		(0.3%, 3.8%)			
Above-ankle target limb amputation at 30 Days		0.9% (2/229)			
All-Cause Death at 30 Days		0.4% (1/229)			
Major re-intervention to the target lesion at 30 Days		0.0% (0/229)			
MALE + POD at 30 Days	PP	0.9% (2/212)[2]	12%	<.0001	MET
[CI]		(0.1%, 3.4%)			
Above-ankle target limb amputation at 30 Days		0.5% (1/213)			
All-Cause Death at 30 Days		0.5% (1/213)			
Major re-intervention to the target lesion at 30 Days		0.0% (0/213)			

[1] Exact binomial test for one proportion. Confidence interval is two-sided exact 95%.
[2] One subject was not evaluable for the primary safety endpoint due to an early 30 day visit and no additional visits beyond 30 days. This subject was therefore not included in the denominator for the primary safety endpoint analysis.

Adverse effects that occurred in the PMA clinical study:

Table 10 below presents an overall summary of adverse events that have been reported through 210 days, displaying the events by device or procedure-relatedness and severity. No events were determined to be unanticipated. At 6 months, there were 28 subject deaths, none of which were attributable to the device. **Table 10a** provides this analysis using the 12-month post-hoc analysis data.

Table 10 All Treatment Emergent Adverse Events with Onset Date within 210 Days Post Index Procedure in ITT Subjects								
	Adverse Events		Device or Procedure Related Events		Serious Adverse Events		Serious Device or Procedure Related Events	
Adverse Event Type (MedDRA SOC / LLT)	# of Events	#(%) of Pts	# of Events	#(%) of Pts	# of Events	#(%) of Pts	# of Events	#(%) of Pts
Blood and lymphatic system disorders	5	5 (2.1%)			5	5 (2.1%)		
Cardiac disorders	38	32 (13.7%)			37	32 (13.7%)		
Ear and labyrinth disorders	1	1 (0.4%)			1	1 (0.4%)		
Gastrointestinal disorders	14	12 (5.2%)	2	1 (0.4%)	13	12 (5.2%)	1	1 (0.4%)
General disorders and administration site conditions	16	16 (6.9%)	8	8 (3.4%)	12	12 (5.2%)	4	4 (1.7%)
Hepatobiliary disorders	1	1 (0.4%)			1	1 (0.4%)		
Infections and infestations	40	25 (10.7%)	15	11 (4.7%)	38	23 (9.9%)	14	10 (4.3%)
Injury, poisoning and procedural complications	49	38 (16.3%)	27	24 (10.3%)	24	19 (8.2%)	10	10 (4.3%)
Metabolism and nutrition disorders	11	8 (3.4%)			11	8 (3.4%)		
Musculoskeletal and connective tissue disorders	8	8 (3.4%)			6	6 (2.6%)		
Neoplasms benign, malignant and unspecified (incl cysts and polyps)	6	5 (2.1%)			5	5 (2.1%)		
Nervous system disorders	12	12 (5.2%)			12	12 (5.2%)		
Psychiatric disorders	3	3 (1.3%)			3	3 (1.3%)		
Renal and urinary disorders	10	9 (3.9%)	1	1 (0.4%)	10	9 (3.9%)	1	1 (0.4%)
Reproductive system and breast disorders	1	1 (0.4%)			1	1 (0.4%)		
Respiratory, thoracic and mediastinal disorders	7	6 (2.6%)	1	1 (0.4%)	7	6 (2.6%)	1	1 (0.4%)
Skin and subcutaneous tissue disorders	8	7 (3.0%)	4	4 (1.7%)	8	7 (3.0%)	4	4 (1.7%)
Surgical and medical procedures	1	1 (0.4%)			1	1 (0.4%)		
Vascular disorders	73	55 (23.6%)	29	27 (11.6%)	57	43 (18.5%)	20	18 (7.7%)
TOTAL	304	137 (58.8%)	87	67 (28.8%)	252	117 (50.2%)	55	46 (19.7%)

[1]When an event is CEC adjudicated for device or procedure relatedness, the CEC adjudication will be used in the analysis. Otherwise, the investigator reported device or procedure relatedness will be used.

Table 10a All Treatment Emergent Adverse Events with Onset Date within 390 Days Post Index Procedure in ITT Subjects								
	Adverse Events		Device or Procedure Related Events		Serious Adverse Events		Serious Device or Procedure Related Events	
Adverse Event Type (MedDRA SOC / LLT)	# of Events	#(%) of Pts	# of Events	#(%) of Pts	# of Events	#(%) of Pts	# of Events	#(%) of Pts
Blood and lymphatic system disorders	5	5 (2.1%)			5	5 (2.1%)		
Cardiac disorders	59	44 (18.9%)			58	44 (18.9%)		
Ear and labyrinth disorders	1	1 (0.4%)			1	1 (0.4%)		
Eye disorders	3	3 (1.3%)			3	3 (1.3%)		
Gastrointestinal disorders	22	19 (8.2%)	2	1 (0.4%)	21	19 (8.2%)	1	1 (0.4%)
General disorders and administration site conditions	24	23 (9.9%)	8	8 (3.4%)	18	17 (7.3%)	4	4 (1.7%)
Hepatobiliary disorders	1	1 (0.4%)			1	1 (0.4%)		
Infections and infestations	57	34 (14.6%)	16	12 (5.2%)	55	32 (13.7%)	15	11 (4.7%)
Injury, poisoning and procedural complications	57	44 (18.9%)	27	24 (10.3%)	29	22 (9.4%)	10	10 (4.3%)
Investigations	1	1 (0.4%)			1	1 (0.4%)		
Metabolism and nutrition disorders	14	10 (4.3%)			14	10 (4.3%)		
Musculoskeletal and connective tissue disorders	13	12 (5.2%)			9	8 (3.4%)		
Neoplasms benign, malignant and unspecified (incl cysts and polyps)	9	8 (3.4%)			8	8 (3.4%)		
Nervous system disorders	20	18 (7.7%)			20	18 (7.7%)		
Product issues	1	1 (0.4%)	1	1 (0.4%)				
Psychiatric disorders	4	4 (1.7%)			4	4 (1.7%)		
Renal and urinary disorders	13	11 (4.7%)	1	1 (0.4%)	13	11 (4.7%)	1	1 (0.4%)
Reproductive system and breast disorders	1	1 (0.4%)			1	1 (0.4%)		

Table 10a All Treatment Emergent Adverse Events with Onset Date within 390 Days Post Index Procedure in ITT Subjects								
	Adverse Events		Device or Procedure Related Events		Serious Adverse Events		Serious Device or Procedure Related Events	
Adverse Event Type (MedDRA SOC / LLT)	# of Events	#(%) of Pts	# of Events	#(%) of Pts	# of Events	#(%) of Pts	# of Events	#(%) of Pts
Respiratory, thoracic and mediastinal disorders	11	10 (4.3%)	1	1 (0.4%)	11	10 (4.3%)	1	1 (0.4%)
Skin and subcutaneous tissue disorders	11	10 (4.3%)	4	4 (1.7%)	11	10 (4.3%)	4	4 (1.7%)
Surgical and medical procedures	1	1 (0.4%)			1	1 (0.4%)		
Vascular disorders	96	69 (29.6%)	32	30 (12.9%)	77	54 (23.2%)	22	20 (8.6%)
Not MedDRA Coded	4	4 (1.7%)			3	3 (1.3%)		
TOTAL	428	160 (68.7%)	92	70 (30.0%)	364	145 (62.2%)	58	48 (20.6%)
[1]When an event is CEC adjudicated for device or procedure relatedness, the CEC adjudication will be used in the analysis. Otherwise, the investigator reported device or procedure relatedness will be used.								

2. Effectiveness Results

Primary Effectiveness Endpoint

In the ITT population, the primary effectiveness endpoint of freedom from MALE at 6 months plus POD at 30 days was 95.6% with a two-sided 95% lower confidence bound of 91.8%, which met the pre-defined PG of 74% ($p<0.0001$). The freedom from MALE at 6 months plus POD at 30 days in the PP subjects was 95.8% with a two-sided 95% lower confidence interval of 91.8%.

Table 11 Freedom from MALE at 6 months + POD at 30 days				
	% (n/N) (CI)[1]	Performance Goal	p-value[1]	Study Endpoint
Freedom MALE at 6 months + POD at 30 days ITT	95.6% (196/205)	74%	<.0001	MET
[CI]	(91.8%, 97.8%)			
MALE at 6 months	3.9% (8/205)			
Above-ankle target limb amputation	1.5% (3/205)			
Major re-intervention to the target lesion	2.4% (5/205)			
POD at 30 days	0.4% (1/229)			
Freedom MALE at 6 months + POD at 30 days PP	95.8% (183/191)	74%	<.0001	MET
[CI]	(91.8%, 98.0%)			
MALE at 6 months	3.7% (7/191)			
Above-ankle target limb amputation	1.0% (2/191)			
Major re-intervention to the target lesion	2.6% (5/191)			
POD at 30 days	0.5% (1/213)			
[1] Continuity corrected z-test for one proportion. Two-sided 95% confidence bound.				

Secondary Endpoints

Primary Patency of the Tacked Segment of the Treated Lesion at 6 months

Target lesion(s) tacked segment(s) patency at 6 months was defined as the presence of blood flow using DUS or angiography if performed during the designated follow-up window. The PG for this endpoint was 64% and the analysis of this endpoint is summarized in **Table 12.** Patency of target lesions in Tacked segments in the ITT subjects was 82.1% with a two-sided 95% lower confidence bound of 77.2%, which met the pre-defined PG (p<0.0001). The same measure in PP subjects was 81.6% with a two-sided 95% lower confidence interval of 76.5% (p<0.0001).

Table 12 Target lesion(s) tacked segment(s) patency at 6 months

	ITT or PP	% (n/N) (CI)[1]	Performance Goal	p-value[1]	Study Endpoint
Target lesion(s) tacked segment(s) patency	ITT	82.1% (247/301)	64%	<.0001	MET
[CI]		(77.2%, 86.2%)			
Target lesion(s) tacked segment(s) patency	PP	81.6% (230/282)	64%	<.0001	MET
[CI]		(76.5%, 85.9%)			

[1] Continuity corrected z-test for one proportion. Two-sided 95% confidence bound.

Target Limb Salvage at 6 Months

Target limb salvage was defined as freedom from any above-ankle target limb amputation at 6 months. There was no formal hypothesis for this endpoint. Per **Table 13**, the target limb salvage at 6 months for the ITT population was 98.5% with a lower two-sided 95% confidence interval of 95.8%.

Table 13 Target Limb Salvage at 6 months

	ITT Subjects % (n/N) (95% CI)[1]	PP Subjects % (n/N) (95% CI)[1]
Target Limb Salvage	98.5% (202/205)	99.0% (189/191)
[95% CI]	(95.8%, 99.7%)	(96.3%, 99.9%)

[1] Exact 95% Confidence Interval

Table 14 displays the Device, Target Lesion, and Procedure Success analysis. All measures of device and procedure success were acceptably high (>96%) indicating that the investigators were able to deploy and place the Tack implants, have acceptable index procedure outcomes, and have no MALE or POD events during the procedure.

Table 14 Device and Procedure Success		
	ITT Subjects % (n/N) (95% CI)[1]	**PP Subjects % (n/N) (95% CI)[1]**
Device Success per device introduced	96.5% (303/314)	100.0% (291/291)
[95% CI]	(93.8%, 98.2%)	(98.7%, 100.0%)
Device Success per subject	96.1% (224/233)	100.0% (217/217)
[95% CI]	(92.8%, 98.2%)	(98.3%, 100.0%)
Target Lesion Success per target lesion	98.8% (256/259)	99.2% (241/243)
[95% CI]	(96.7%, 99.8%)	(97.1%, 99.9%)
Target Lesion Success per target lesion (lack of bailout stent to tacked segment only) [2]	99.6% (258/259)	99.6% (242/243)
[95% CI]	(97.9%, 100.0%)	(97.7%, 100.0%)
Procedural Success per subject	98.7% (230/233)	99.1% (215/217)
[95% CI]	(96.3%, 99.7%)	(96.7%, 99.9%)

[1] Exact 95% confidence interval

[2] Of the 3 subject/lesions with bailout stenting indicated, 1 was located in a tacked region and 2 were located outside of the tacked region.

Time to event observational endpoints are summarized in **Table 15**. At the end of the 6-month visit window (210 Days), Target Limb Salvage was 98.1% and overall survival was 95.0%. Freedom from target vessel and target lesion revascularization (both clinically-driven and overall) were 88.2% and 89.4%, respectively. In the 12-month (360 Day) post-hoc analysis cohort, Target Limb Salvage was 98.1% and overall survival was 87.0%. Freedom from target vessel and target lesion revascularization (both clinically-driven and overall) were 82.4% and 82.7%, respectively.

Table 15. Summary of time to event endpoints in ITT Subjects (Kaplan Meier Analysis)					
	Estimate # events, # at risk				
Parameter	**30 Days**	**180 Days**	**210 Days**	**360 Days**	**390 Days**
Target Limb Salvage - Freedom from amputation of the target limb (above the ankle)	99.1% 2, 225	98.6% 3, 183	98.1% 4, 156	98.1% 4, 97	98.1% 4, 18
Amputation Free Survival	98.7% 3, 225	95.9% 9, 192	93.2% 14, 165	90.2% 19, 107	85.5% 21, 28
Survival	99.6% 1, 225	97.2% 6, 192	95.0% 10, 165	91.9% 15, 107	87.0% 17, 27
Freedom from Unplanned below-ankle target limb amputation(s): digit or transmetatarsal	98.7% 3, 223	93.4% 14, 173	93.4% 14, 149	91.4% 17, 94	91.4% 17, 20
Freedom from clinically driven target vessel revascularization (CD-TVR)	100.0% 0, 225	91.7% 17, 169	88.2% 23, 140	82.4% 32, 82	82.4% 32, 18

Table 15. Summary of time to event endpoints in ITT Subjects (Kaplan Meier Analysis)					
	Estimate # events, # at risk				
Parameter	**30 Days**	**180 Days**	**210 Days**	**360 Days**	**390 Days**
Freedom from any target vessel revascularization (TVR)	100.0% 0, 225	91.7% 17, 169	88.2% 23, 140	82.4% 32, 82	82.4% 32, 18
Freedom from clinically driven target lesion revascularization (CD-TLR)	100.0% 0, 225	92.2% 16, 170	89.4% 21, 141	82.7% 31, 82	82.7% 31, 18
Freedom from any target lesion revascularization (TLR)	100.0% 0, 225	92.2% 16, 170	89.4% 21, 141	82.7% 31, 82	82.7% 31, 18
Freedom from MALE+POD	98.7% 3, 225	95.8% 9, 178	95.2% 10, 151	95.2% 10, 94	95.2% 10, 18

Table 16 provides a summary of patency results based on the Kaplan-Meier Analysis at 6 months and in the post-hoc analysis cohort at 12 months.

Table 16. Summary of 6 and 12 Month Patency in ITT Subjects (Kaplan Meier Analysis)					
Parameter	**30 Days**	**180 Days**	**210 Days**	**360 Days**	**390 Days**
Tacked Segment Patency	99.6% 1, 253	89.8% 26, 228	88.6% 29, 225	79.1% 53, 201	75.6% 62, 0
Assisted Tacked Segment Patency	99.6% 1, 253	89.8% 26, 228	88.6% 29, 225	79.1% 53, 201	75.6% 62, 0
Secondary Tacked Segment Patency	100.0% 0, 234	100.0% 0, 234	100.0% 0, 234	94.4% 13, 221	88.0% 28, 0
Tacked Segment PSVR patency	99.6% 1, 243	86.5% 33, 211	83.6% 40, 204	67.6% 79, 165	62.3% 92, 0
Assisted Target Lesion Patency	99.4% 1, 160	88.2% 19, 142	86.3% 22, 139	77.0% 37, 124	71.4% 46, 0
Secondary Target Lesion Patency	100.0% 0, 150	100.0% 0, 150	100.0% 0, 150	93.3% 10, 140	84.0% 24, 0
Target Lesion PSVR patency	99.4% 1, 155	85.3% 23, 133	80.8% 30, 126	61.5% 60, 96	53.2% 73, 0
Assisted Patient Level Target Lesion Patency	99.3% 1, 148	89.3% 16, 133	87.2% 19, 130	77.2% 34, 115	71.1% 43, 0
Secondary Patient Level Target Lesion Patency	100.0% 0, 140	100.0% 0, 140	100.0% 0, 140	92.9% 10, 130	82.9% 24, 0
Patient level target lesion PSVR patency	99.3% 1, 144	86.9% 19, 126	82.1% 26, 119	62.1% 55, 90	53.1% 68, 0

[1] Based on analysis of 12-month DUS results.

The WIfI classification system was developed by the Society for Vascular Society to grade the severity of the three major risk factors leading to amputation: wound, ischemia and foot infection. The scale for each factor ranges from 0 (none present) to 3 (severe). Subjects were evaluated at baseline and follow-up visits per **Table 17**. At 6 months, there were significant ($p<0.05$) improvements in all three risk factors from baseline. These improvements continued in 12 month post-hoc analysis cohort.

Table 17. WIfI Classification and Changes in WIfI Classification from Baseline in ITT Subjects

Parameter	Baseline	30 Day	6 Month	12 Month
Wound Grade				
0	52.4% (122/233)	68.8% (148/215)	82.1% (160/195)	87.3% (131/150)
1	39.1% (91/233)	22.3% (48/215)	13.3% (26/195)	8.7% (13/150)
Modified 2	8.6% (20/233)	7.0% (15/215)	3.6% (7/195)	3.3% (5/150)
2	0.0% (0/233)	0.0% (0/215)	0.0% (0/195)	0.7% (1/150)
3	0.0% (0/233)	1.9% (4/215)	1.0% (2/195)	0.0% (0/150)
Wound Grade Change from Baseline				
Worsened 4 steps	-	0.5% (1/215)	0.0% (0/195)	0.0% (0/150)
Worsened 3 steps	-	0.9% (2/215)	0.5% (1/195)	0.0% (0/150)
Worsened 2 steps	-	0.5% (1/215)	1.0% (2/195)	0.0% (0/150)
Worsened 1 step	-	1.4% (3/215)	2.1% (4/195)	5.3% (8/150)
No change	-	79.1% (170/215)	66.2% (129/195)	58.7% (88/150)
Improved 1 step	-	17.7% (38/215)	28.2% (55/195)	31.3% (47/150)
Improved 2 steps	-	0.0% (0/215)	2.1% (4/195)	4.7% (7/150)
Improved 3 steps	-	0.0% (0/215)	0.0% (0/195)	0.0% (0/150)
Improved 4 steps	-	0.0% (0/215)	0.0% (0/195)	0.0% (0/150)
p-value[1]	-	0.0002	<.0001	-
Foot Infection Grade				
0	83.3% (194/233)	90.2% (194/215)	94.3% (183/194)	94.7% (142/150)
1	16.7% (39/233)	6.5% (14/215)	3.6% (7/194)	4.0% (6/150)
2	0.0% (0/233)	2.8% (6/215)	1.5% (3/194)	1.3% (2/150)
3	0.0% (0/233)	0.5% (1/215)	0.5% (1/194)	0.0% (0/150)
Foot Infection Grade Change from Baseline				
Worsened 3 steps	-	0.5% (1/215)	0.5% (1/194)	0.0% (0/150)
Worsened 2 steps	-	0.9% (2/215)	0.0% (0/194)	0.7% (1/150)
Worsened 1 step	-	2.8% (6/215)	4.1% (8/194)	3.3% (5/150)
No change	-	87.9% (189/215)	83.0% (161/194)	83.3% (125/150)

Table 17. WIfI Classification and Changes in WIfI Classification from Baseline in ITT Subjects				
Parameter	**Baseline**	**30 Day**	**6 Month**	**12 Month**
Improved 1 step	-	7.9% (17/215)	12.4% (24/194)	12.7% (19/150)
Improved 2 steps	-	0.0% (0/215)	0.0% (0/194)	0.0% (0/150)
Improved 3 steps	-	0.0% (0/215)	0.0% (0/194)	0.0% (0/150)
p-value[1]	-	0.4396	0.0171	-
[1] Wilcoxon Signed Rank Test.				

Table 18 summarizes Rutherford Category by visit and changes from baseline. By protocol, all subjects were Rutherford class 3 (Rev A of protocol only), 4, or 5 at baseline. At 6 months, 71.8% of ITT subjects were class 2 or lower (moderate claudication to asymptomatic) and there was significant ($p<0.0001$) improvement in Rutherford Category with 68.4% of subjects improving 2 or more steps. Importantly, only 3 (1.5%) subjects had worsening Rutherford category classification at 6 months. In the 12 month post-hoc analysis cohort, 81.3% ITT subjects were class 2 or lower (moderate claudication to asymptomatic) and 76.7% of subjects improved 2 or more steps. Importantly, only 4 (2.7%) subjects had worsening Rutherford category classification at 12 months.

Table 18. Rutherford Category and Changes in Rutherford Clinical Category from Baseline in ITT Subjects				
Parameter	**Baseline**	**30 Day**	**6 Month**	**12 Month**
Rutherford Category				
0-Asymptomatic	0.0% (0/233)	23.7% (52/219)	26.1% (52/199)	32.0% (48/150)
1-Mild Claudication	0.0% (0/233)	25.1% (55/219)	29.6% (59/199)	33.3% (50/150)
2-Moderated Claudication	0.0% (0/233)	11.9% (26/219)	16.1% (32/199)	16.0% (24/150)
3-Severe Claudication	16.3% (38/233)	4.6% (10/219)	7.0% (14/199)	4.0% (6/150)
4-Ischemic Rest Pain	33.5% (78/233)	3.2% (7/219)	3.0% (6/199)	2.0% (3/150)
5-Minor Tissue Loss	50.2% (117/233)	30.1% (66/219)	17.1% (34/199)	12.7% (19/150)
6-Ulceration or gangrene	0.0% (0/233)	1.4% (3/219)	1.0% (2/199)	0.0% (0/150)
Rutherford Change from Baseline				
Worsened 4 steps	-	0.0% (0/219)	0.0% (0/199)	0.0% (0/150)
Worsened 3 steps	-	0.0% (0/219)	0.0% (0/199)	0.0% (0/150)
Worsened 2 steps	-	0.0% (0/219)	0.0% (0/199)	0.0% (0/150)
Worsened 1 step	-	1.4% (3/219)	1.5% (3/199)	2.7% (4/150)
No change	-	32.9% (72/219)	19.1% (38/199)	12.7% (19/150)
Improved 1 step	-	7.8% (17/219)	11.1% (22/199)	8.0% (12/150)
Improved 2 steps	-	13.7% (30/219)	18.1% (36/199)	16.7% (25/150)
Improved 3 steps	-	20.1% (44/219)	16.1% (32/199)	19.3% (29/150)

Table 18. Rutherford Category and Changes in Rutherford Clinical Category from Baseline in ITT Subjects				
Parameter	**Baseline**	**30 Day**	**6 Month**	**12 Month**
Improved 4 steps	-	17.4% (38/219)	22.1% (44/199)	24.7% (37/150)
Improved 5 steps	-	6.8% (15/219)	12.1% (24/199)	16.0% (24/150)
p-value[1]	-	<.0001	<.0001	-
[1] Wilcoxon Signed Rank Test.				

Ankle Brachial index (ABI) and TBI were measured at baseline and at each follow-up visit. **Table 19** describes the results of the changes in AB and TBI from baseline through follow-up for ITT subjects. The mean ABI and TBI were significantly ($p<0.0001$) higher at 30 day and 6 month visits versus baseline, and the trend appeared to continue with the 12 month post-hoc analysis data.

Table 19. ABI and Changes in ABI from Baseline in ITT Subjects				
Parameter	**Baseline**	**30 Day**	**6 Month**	**12 Month**
ABI in the Target Limb				
At follow-up	0.74 ± 0.27 (197) (0.00, 0.75, 1.29)	0.97 ± 0.19 (176) (0.00, 0.99, 1.29)	0.91 ± 0.19 (166) (0.16, 0.94, 1.29)	0.91 ± 0.20 (129) (0.30, 0.93, 1.27)
p-value[1]	-	<.0001	<.0001	-
TBI in the Target Limb				
At follow-up	0.43 ± 0.23 (118) (0.00, 0.41, 1.48)	0.66 ± 0.28 (123) (0.00, 0.64, 1.63)	0.59 ± 0.28 (142) (0.00, 0.58, 1.82)	0.61 ± 0.28 (124) (0.00, 0.60, 1.89)
p-value[1]	-	<.0001	<.0001	-
[1] Wilcoxon Signed Rank Test.				

IVI also collected information regarding changes from baseline in EQ-5D-3L and WIQ. Positive changes were seen from baseline to 12 months in both quality of life measures.

Tack integrity was evaluated at 12 months. At the time of the post-hoc analysis of 12-month follow-up data, 125 subjects had radiographic evaluations of their implants performed. There were no Tack embolizations, migrations, or fractures in any of these subjects per **Table 20**.

Table 20. Tack Integrity at 12 Months in the Intent-to-Treat subjects	
Event	**ITT Subjects % (n/N)**
Tack Embolization	0.0% (0/125)
Tack Migration	0.0% (0/125)
Tack Fracture	0.0% (0/125)

3. Subgroup Analyses

Subgroup analyses were performed for the following and are summarized in **Table 21 - Table 23** below:

- Gender
- Geography
- Dissection

The TOBA II BTK study was not powered to demonstrate statistical significance within the subgroups for the primary efficacy and safety endpoints.

Table 21 Subgroup Analyses of Primary Endpoints – By Gender and Region

	Primary Safety Endpoint % (n/N)	**Primary Efficacy Endpoint % (n/N)**
Gender		
Male	1.3% (2/152)	95.7% (135/141)
Female	1.3% (1/76)	95.3% (61/64)
P-Value[1]	1.0000	1.0000
US vs. OUS		
US	0.8% (1/128)	95.6% (109/114)
OUS	2.0% (2/100)	95.6% (87/91)
P-Value[1]	0.5831	1.0000

[1] P-Value from Fisher's Exact test.

Table 22. Primary and Secondary Endpoints at 6 months stratified by dissection grade

			Secondary Endpoints	
	Primary Safety Endpoint (MALE + POD at 30 days)	**Primary Efficacy Endpoint** (Freedom from MALE at 6 months plus POD at 30 days)	**Tacked Segment Patency at 6 months**	**Target Limb Salvage at 6 months**
Dissection Grade[1]				
A	0.0% (0/47)	97.6% (41/42)	91.7% (44/48)	100.0% (42/42)
B	1.1% (1/90)	97.6% (80/82)	82.8% (106/128)	100.0% (82/82)
C	0.0% (0/26)	96.2% (25/26)	82.9% (29/35)	100.0% (26/26)
D	3.4% (2/59)	90.4% (47/52)	73.0% (65/89)	94.2% (49/52)
E	0.0% (0/2)	100.0% (1/1)	100.0% (2/2)	100.0% (1/1)
F	-	-	-	-

[1] Worst dissection by subject per Core Lab.

Table 23. Additional Subgroup Analyses for 12 Month Endpoints			
	Freedom from MALE at 12 Months + POD	**Tacked Segment Patency**	**Target Limb Salvage**
Dissection Grade[1]			
A	94.1% (32/34)	90.7% (39/43)	97.1% (33/34)
B	96.4% (54/56)	78.9% (75/95)	100.0% (56/56)
C	93.8% (15/16)	76.7% (23/30)	100.0% (16/16)
D	88.4% (38/43)	64.0% (55/86)	93.0% (40/43)
E	100.0% (1/1)	-	100.0% (1/1)
F	-	-	-
[1] Worst dissection by subject per Core Lab.			

4. Pediatric Extrapolation

In this premarket application, existing clinical data was not leveraged to support approval of a pediatric patient population.

E. Financial Disclosure

The Financial Disclosure by Clinical Investigators regulation (21 CFR 54) requires applicants who submit a marketing application to include certain information concerning the compensation to, and financial interests and arrangement of, any clinical investigator conducting clinical studies covered by the regulation. The TOBA II BTK pivotal clinical study included 180 investigators. None of the clinical investigators had disclosable financial interests/arrangements as defined in sections 54.2(a), (b), (c), and (f). The information provided does not raise any questions about the reliability of the data.

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

In accordance with the provisions of section 515(c)(3) 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 *in vitro* engineering testing conducted on the Tack Endovascular System® (4F, 1.5-4.5mm) and delivery system demonstrated that the performance characteristics of the device met the product specifications. The test results obtained from sterilization testing demonstrated that the product can be adequately sterilized and is acceptable for clinical use. The shelf life testing has established acceptable performance for a labeled shelf life up to 2 years.

The prospective, multi-center, single-arm, non-blinded TOBA II BTK study investigated the safety and efficacy of the Tack Endovascular System® (4F, 1.5-4.5mm) for the repair of dissection(s) type(s) A through F resulting from percutaneous transluminal balloon angioplasty (PTA) in the mid/distal popliteal, tibial and peroneal arteries. The TOBA II BTK primary efficacy endpoint of freedom from MALE at 6 months plus POD at 30 days was 95.6% with a two-sided 95% lower confidence bound of 91.8%, which met the PG of 74% ($p<0.0001$). The secondary endpoint of primary patency of the Tacked segments at 6 months was 82.1% with a two-sided 95% lower confidence bound of 77.2% which met the PG of 64% ($p<0.0001$). The unpowered secondary endpoint of target limb salvage at 6 months was 98.5% with a two-sided 95% lower confidence bound of 95.8%.

Device and procedure success per subject were adequate; 96.5% and 98.7%, respectively. At 12 months, there were no fractures, embolizations or migrations.

B. Safety Conclusions

The risks of the device are based on nonclinical laboratory and/or animal studies as well as data collected in a clinical study conducted to support PMA approval as described above.

The TOBA II BTK primary safety endpoint of MALE plus POD at 30 days was met. Three (1.3%) MALE events (two above the ankle amputations and one subject death) and no PODs were reported in the first 30 days. The upper two-sided 95% confidence interval was 3.8% versus the PG of 12% ($p<0.0001$). No unanticipated adverse device effects were observed, and no deaths were attributable to the device or procedure throughout the observed period. No unanticipated adverse device effects were observed, and no deaths were attributable to the device or procedure throughout the observed period.

C. Benefit-Risk Determination

The probable benefits of the device are based on data collected in the TOBA II BTK clinical study conducted to support PMA approval as described above. The benefits of the device include:

- The PG regarding effectiveness was met.
- The device has the ability to repair dissections while leaving less metal behind than stents, and the Tack implants are designed to apply low outward force to the vessel wall in an effort to reduce injury.
- There was no evidence of embolization, fracture, or migration of the device in the TOBA II BTK clinical study.
- The PG regarding safety was met, with no MAEs reported in the first 30 days of follow-up.

- The use of the Tack Endovascular System® (4F, 1.5-4.5mm) resulted in similar complications as other available endovascular implant devices used in PTA procedures.

1. Patient Perspectives

   This submission did not include specific information on patient perspectives for this device.

In conclusion, given the available information above, the data support that for use in mid/distal popliteal, tibial and peroneal arteries ranging in diameter from 1.5 mm to 4.5 mm for the repair of post-percutaneous transluminal angioplasty (PTA) dissections, the probable benefits of the Tack Endovascular System® (4F, 1.5-4.5mm) outweigh the probable risks.

D. Overall Conclusions

The data in this application support the reasonable assurance of safety and effectiveness of the Tack Endovascular System® (4F, 1.5-4.5mm) when used in accordance with the indications for use. The results from preclinical and clinical studies indicate that the Tack Endovascular System® (4F, 1.5-4.5mm) meets safety and performance specifications. The results from the TOBA II BTK multi-center clinical trial support the conclusion that the Tack Endovascular System® (4F, 1.5-4.5mm) is safe and effective for the repair of post-PTA dissections in the mid/distal popliteal, tibial and peroneal arteries when used in accordance with device labeling and the instructions for use (IFU).

XIII. CDRH DECISION

CDRH issued an approval order on April 10, 2020. The final clinical conditions of approval cited in the approval order are described below.

TOBA II BTK Continued Follow-Up Study. This study should be conducted per protocol CA 0137, Rev C (dated September 14, 2017). This study is a prospective, multi-center follow up of the TOBA II BTK pivotal study (G160144) that treated 233 subjects from 41 investigational sites. It will evaluate the long-term safety and effectiveness of the Tack Endovascular System® (4F, 1.5-4.5mm). All 205 remaining subjects, active at the end of the 6-month evaluation, will continue to be followed annually through 36 months. Follow-up at the 1, 2- and 3-year timepoints will include the following: Rutherford Classification, Wound, Ischemia, and foot Infection (WIfI) grade, wound assessment, target limb resting ABI, , EQ-5D-3L, Walking Impairment Questionnaire (WIQ), major adverse event (MAE) occurrence, adverse event occurrence, and review of concomitant medications (antiplatelets/anticoagulants). Follow-up at the 1-year timepoint will also include duplex ultrasound (DUS) and X-ray assessment of implanted Tacks.

The applicant's manufacturing facilities have been 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.

XV. REFERENCES

1. Conte MS, Geraghty PJ, Bradbury AW, Hevelone ND, Lipsitz SR, Moneta GL, Nehler MR, Powell RJ, Sidawy AN. Suggested objective performance goals and clinical trial design for evaluating catheter-based treatment of critical limb ischemia. J Vasc Surg. 2009;50:1462-73.