Medtronic

Alleviating Pain · Restoring Health · Extending Life

EXPONENT® SELF-EXPANDING CAROTID STENT with OVER-THE-WIRE (OTW) DELIVERY SYSTEM

Instructions for Use

(IFU)

CAUTION: Federal (USA) law restricts this device to sale by or on the order of a physician.

CAUTION: CAREFULLY READ ALL INSTRUCTIONS PRIOR TO USE. FAILURE TO OBSERVE ALL WARNINGS AND PRECAUTIONS MAY RESULT IN COMPLICATIONS.

CONTENTS

This device is supplied in sterile condition. All materials inside the sterile barrier pouch (the delivery system and stent, as shown in Figure 1, as well as the tray, lid, and pouch liner) are sterile. The external surface of the sterile barrier pouch, as well as the product carton, should not be considered sterile.

1.0 DEVICE DESCRIPTION

The Medtronic Vascular Exponent® Self-Expanding Carotid Stent with Over-the-Wire (OTW) Delivery System is designed to deliver a self-expanding stent to the carotid arteries via a sheathed delivery system. The self-expanding stent is constructed of a nickel titanium alloy (Nitinol), and is compressed and loaded into the delivery system. The stent is delivered to the intended lesion site and then expanded by retraction of a protective sheath and remains as a permanent vessel scaffolding implant. Upon deployment, the stent imparts an outward radial force on the arterial lumen to establish patency. The stents are available in diameters of 6.0 mm, 7.0 mm, 8.0 mm, 9.0, mm and 10.0 mm and lengths of 20 mm, 30 mm, and 40 mm.

The stent delivery system is a coaxial Over-the-Wire device. The delivery system has a 135 cm working length and is compatible with 0.014" guidewires and embolic protection devices. A valve relief (EZ-place) component is mounted on the delivery system's proximal outer shaft, which permits movement of the delivery system under the valve relief while a hemostatic valve adapter is closed around the valve relief. Introducer sheaths and guiding catheters with a minimum inner diameter of 0.081" are compatible with the 6.0 mm and 7.0 mm diameter stents. Introducer sheaths and guiding catheters with a minimum inner diameter of 0.091" are compatible with the 8.0 mm, 9.0 mm and 10.0 mm diameter stents. The delivery system, as shown in Figure 1, is comprised of an inner shaft and an outer sheath attached to a sliding tube component inside of a molded polymer handle. Attached to the proximal end of the handle is a bifurcated luer, which permits flushing of the coaxial area and the guidewire lumen. A strain relief is attached to the distal end of the handle and helps prevent kinking of the device. Two radiopaque marker bands are located on the inner shaft, one at each end of the stent to aid in positioning of the stent under fluoroscopy. A third radiopaque marker band located at the distal end of the outer sheath enables visualization of the sheath retraction during stent deployment. A pictorial representation of the Exponent OTW Delivery System is presented in Figure 1.

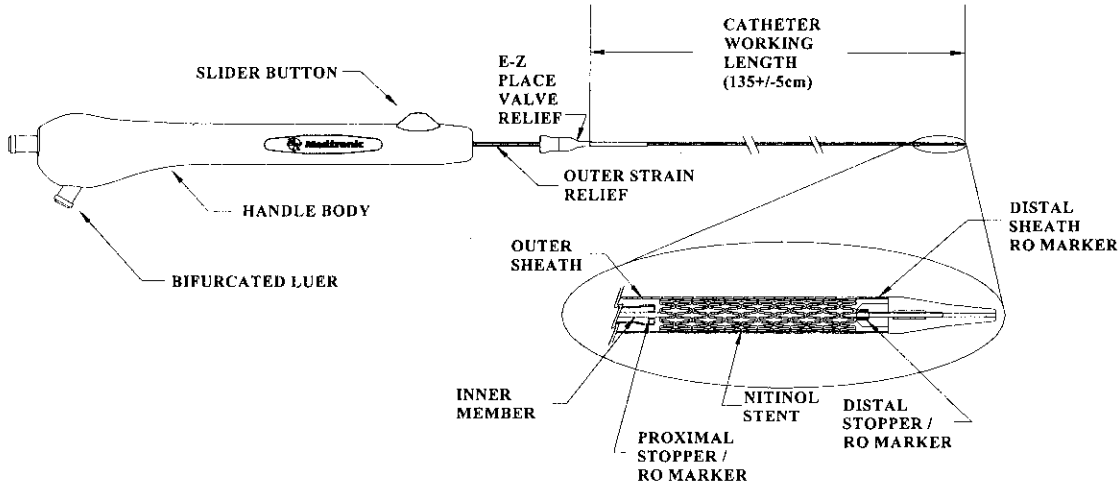


Figure 1. Exponent® Self-Expanding Carotid Stent with Over-The-Wire (OTW) Delivery System

This device is supplied in sterile condition. All materials inside the sterile barrier pouch (the delivery system and stent, as shown in Figure 1, as well as the tray) are sterile. The external surface of the sterile barrier pouch, as well as the product carton, should not be considered sterile.

Table 1. Medtronic Vascular Exponent® Self-Expanding Carotid Stent with OTW Delivery System Product Information

Unconstrained Stent Diameter (mm)	Stent Length (mm)	Reference Vessel Diameter (mm)	Required Sheath or Guiding Catheter I.D.
6.0 mm	20, 30, 40	4.5 - 5.5	0.081" (2.06 mm)
7.0 mm	20, 30, 40	5.5 - 6.5	0.081" (2.06 mm)
8.0 mm	20, 30, 40	6.5 - 7.5	0.091" (2.31 mm)
9.0 mm	20, 30, 40	7.5 - 8.5	0.091" (2.31 mm)
10.0 mm	20, 30, 40	8.5 - 9.5	0.091" (2.31 mm)

2.0 INDICATIONS

The Medtronic Vascular Exponent® Self-Expanding Carotid Stent with OTW Delivery System, used in conjunction with the Medtronic Vascular embolic protection system, is indicated for improving carotid luminal diameter in patients at high risk for adverse events from carotid endarterectomy who require carotid revascularization and meet the criteria outlined below.

1. Patients with neurological symptoms and ≥ 50% stenosis of the common or internal carotid artery by either ultrasound or angiogram OR patients without neurological symptoms and ≥ 80% stenosis of the common or internal carotid artery by either ultrasound or angiogram, AND
2. Patients having a vessel with reference diameters between 4.5 mm and 9.5 mm at the target lesion.

3.0 CONTRAINDICATIONS

The Exponent® Self-Expanding Carotid Stent with OTW Delivery System is contraindicated for use in:

- Patients in whom anticoagulant and/ or antiplatelet therapy is contraindicated.
- Patients with severe vascular tortuosity or anatomy that would preclude the safe introduction of a guide catheter, sheath, embolic protection device, or stent delivery system.
- Patients with known hypersensitivity to Nitinol (nickel-titanium).
- Patients with uncorrected bleeding disorders.
- Lesions in the ostium of the common carotid artery.

4.0 WARNINGS

Only physicians who have received appropriate training and are familiar with the principles, clinical applications, complications, side effects, and hazards commonly associated with carotid stent placement should use this device.

4.1 General

- The safety and efficacy of the Exponent Self-Expanding Carotid Stent System has not been demonstrated with embolic protection devices other than the Medtronic Vascular GuardWire Temporary Balloon Occlusion and Aspiration System
- When multiple stents are required, stent materials should be of similar composition.
- Refer to the Instructions for Use supplied with any interventional devices to be used in conjunction with the Exponent Self-Expanding Carotid Stent with OTW Delivery System for their intended uses, contraindications, and potential complications.
- As with any type of vascular implant, infection secondary to contamination of the stent may lead to rupture, thrombosis, or pseudoaneurysm.
- Stenting across a major bifurcation may prevent or hinder future diagnostic or therapeutic procedures.
- Long-term (> 1 year) performance of the Exponent Self-Expanding Carotid Stent System has not been established.
- The appropriate anticoagulation and antiplatelet therapy should be administrated pre- and post-procedure as suggested in these instructions. Special considerations should be given to those patients with recent active peptic ulcer disease or gastritis.
- Surgical removal of the stent may be required in the event of complications such as infection, pseudoaneurysm, or fistulization.
- Caution is advised when tracking the stent system through any previously deployed devices to avoid the risk of entanglement.

4.2 Patient Selection

The safety and effectiveness of the Exponent Self-Expanding Carotid Stent with OTW Delivery System have NOT been established in patients with the following characteristics:

Patient Characteristics

- Pregnant patients or patients under the age of 18.
- Patients at low to moderate risk for adverse events from carotid endarterectomy.
- Patients with aneurismal dilation immediately proximal to or distal to the lesion.
- Patients experiencing acute ischemic neurological stroke or patients who experienced a stroke within 4 weeks prior to the procedure.
- Patients with coagulopathies.
- Patients with perforated vessels as evidenced by extravasation of contrast media.
- Patients with poor renal function who may be at high risk for a contrast medium reaction, in the opinion of the physician.
- Patients with arteriovenous malformations of the territory of the target carotid artery.
- Patients with an intracranial mass lesion (i.e., abscess, infection, or tumor) or aneurysm > 5 mm.
- Patients with bilateral stenosis.

Lesion Characteristics

- Patients with evidence of intraluminal thrombus thought to increase the risk of distal embolization and/ or plaque fragmentation.
- Patients with a total occlusion of the target vessel.
- Patients having highly calcified lesions resistant to PTA.
- Patients whose lesion(s) may require the use of two or more stents.

Access Characteristics

- Patients in whom vascular access is not possible.
- Patients with known peripheral vascular tortuosity, supra-aortic tortuosity, or carotid artery tortuosity that precludes safe use of catheter-based tecniques.

4.3 Device Use

- This device is intended for single-use only. DO NOT use the product after the 'Use By' date noted on the packaging.
- Package contains one self-expanding carotid stent system. Store at room temperature.
- DO NOT re-use. DO NOT resterilize, as this can compromise device performance and may increase the risk of cross-contamination due to inappropriate reprocessing. Sterilized by e-beam irradiation.
- DO NOT use this product if the temperature indicator on the inner pouch is black.
- Ensure optimal positioning of the stent prior to deployment. Once deployment is initiated the stent cannot be repositioned or recaptured. Stent retrieval methods and the use of additional wires, snares, and/ or forceps may result in additional trauma to the carotid vessel or the vascular access site. Complications may result in bleeding, hematoma, pseudoaneurysm, stroke or death.
- Overstretching of the artery may result in rupture and life-threatening bleeding.
- Implanting a stent may lead to dissection of the vessel distal to and/ or proximal to the stent and may cause acute vessel closure requiring additional intervention such as carotid endarterectomy, placement of additional stents or further dilatation.
- Appropriate stent sizing is required to reduce the possibility of stent migration. The stent may migrate from the site of implant, embolize or cause a thrombus distally from the implant site down the arterial lumen. Maintain the patient's activated clotting time (ACT) at > 250 seconds throughout the stent delivery and implant procedure to prevent thrombus formation on the stent delivery system. In the event of thrombosis of the expanded stent, thrombolysis and PTA may be attempted. If IIb / IIIa inhibitors are used, maintain the ACT at > 200 seconds.
- Maintain a continuous flush while removing and inserting devices over the guidewire of the embolic protection device. Perform all device exchanges slowly in order to prevent air embolism or trauma to the artery.
- Allow for and maintain an adequate distance between the embolic protection system and the stent delivery system and/ or the deployed stent in order to prevent possible entanglement of the two systems. If entanglement should occur and cannot be corrected, surgical intervention should be considered.

5.0 PRECAUTIONS

- Venous access should be available during carotid intervention to manage bradycardia or tachycardia by either medical therapy or temporary pacing.

5.1 Stent Handling – Precautions

- Special care must be taken not to handle or in any way disrupt the stent on the delivery system. This is most important during catheter removal from packaging, placement over the guidewire and advancement through a rotating hemostasis valve (RHV) adapter and guiding catheter hub.
- Carefully inspect the Exponent Self-Expanding Carotid Stent with OTW Delivery System to verify that the device has not been damaged in shipment. Do not use damaged product.
- Take care to avoid unnecessary handling which may kink or damage the delivery system. Keep the delivery system as straight as possible and the delivery handle stationary during deployment. Do not use if device is kinked.
- Do not hold the shaft of the delivery catheter during deployment. Ensure the EZ Place valve relief is being utilized to assure freedom of movement of the outer sheath during deployment.
- Do not expose the delivery system to organic solvents as structural integrity and/ or device function may be impaired.
- Do not remove the stent from its delivery system, as removal may damage the stent. If removed, the stent cannot be put back onto the delivery system.
- The stent and the delivery system are designed to perform as an integrated system to be used only as designed.

5.2 Stent Placement – Precautions

- Ensure that the stent delivery system is fully flushed with heparinized saline prior to use. Do not use the delivery system if the flush is not observed exiting at the distal end of the catheter.
- Use with bleedback control hemostatic valves is not recommended.
- The Exponent Self-Expanding Carotid Stent with OTW Delivery System is not compatible with guidewires or embolic protection devices larger than 0.014" (0.36 mm).
- The Exponent Self-Expanding Carotid Stent with OTW Delivery System must be used with a guiding catheter or sheath to maintain adequate support of the 0.014" guidewire or embolic protection device throughout the procedure.
- If resistance is met during introduction or delivery of the stent delivery system, or during retraction of the outer sheath, the system should be carefully withdrawn and another system used.
- When catheters are in the body, they should be manipulated only under fluoroscopy. Radiographic equipment that provides high quality images is needed.
- Leave the slider button locked in place until the stent is ready to be deployed.
- Do not attempt to pull a partially deployed stent back through the guiding catheter or sheath; dislodgement of the stent from the delivery system may occur.
- Prior to stent deployment, remove all slack from the delivery system.
- Withdraw the stent system carefully if resistance is encountered during movement through the sheath or during initial retraction of the sheath.
- The delivery system is not designed for use with power injection. Use of power injection may adversely affect device performance.
- When more than one stent is required to cover the lesion or if there are multiple lesions, the distal lesion should be stented first followed by stenting of the proximal lesion. Stenting in this order obviates the need to cross the proximal stent for placement of the distal stent and reduces the chance of dislodging stents that have already been placed.

- Although not studied in the clinical trial, if overlap of sequential stents is necessary, the amount of overlap should be kept to a minimum (approximately 5 mm). In no instance should more than 2 stents overlap.

Note: The full effect of overlapping multiple stents in the carotid system has not been established.

5.3 Post- Implant – Precautions

- Care must be exercised when crossing a newly deployed stent with other interventional devices to avoid disrupting the stent geometry and placement of the stent.
- In the event of thrombosis of the expanded stent, thrombolysis and PTA should be attempted.

5.3.1 MRI Compatibility

Non-clinical testing has demonstrated that the Exponent Self-Expanding Carotid Stent is Magnetic Resonance (MR) Conditional. It can be scanned under the following conditions:

- Static magnetic field strength of 3.0 Tesla or less
- Spacial gradient field strength of 720 Gauss/cm or less
- Maximum whole-body-averaged specific absorption rate (SAR) of 3.0 W/kg for 15 minutes of scanning

In non-clinical testing, the Exponent Carotid Stent produced a temperature rise of less than 0.8° C at a maximum MR system reported whole body averaged specific absorption rate (SAR) of 3.0 W/kg for 15 minutes of MR scanning in a 3-Tesla (Excite, Software G3.0-052B General Electric Medical Systems, Milwaukee WI) active-shielded, horizontal field scannner.

MR image quality may be compromised if the area of interest is in the exact same area or relatively close to the position of the Exponent Carotid Stent. Therefore, it may be necessary to optimize MR imaging parameters for the presence of this metallic implant. The effect of performing MRI procedures using higher levels of RF energy on a patient with the stent has not been determined. The effect of performing MRI procedures on patients with overlapping stents has not been determined.

6.0 ADVERSE EVENTS

6.1 Observed Adverse Events

The Exponent Self-Expanding Carotid Stent with Over-the-Wire (OTW) Delivery System and the GuardWire® Temporary Occlusion & Aspiration System were evaluated for the treatment of high-risk surgical patients with lesions in the common carotid and internal carotid artery that are amenable to percutaneous treatment with stenting. A total of 498 patients were enrolled into two separate trials as follows:

- MAVErIC I, a feasibility study, evaluated the Over-the-Wire (OTW) Exponent Self-Expanding Carotid Stent System with the GuardWire Temporary Occlusion & Aspiration System and included 99 patients. The primary objective of this study was to evaluate the safety and efficacy in treating carotid stenosis in patients at high risk for carotid endarterectomy (CEA) in the population under evaluation.

- MAVErIC II, a pivotal study, evaluated the Over-the-Wire (OTW) Exponent Self-Expanding Carotid Stent System and the GuardWire Temporary Occlusion & Aspiration System expanded to include 399 patients. The primary objective of the study was the same as MAVErIC I in treating carotid stenosis in patients at high risk for carotid endarterectomy (CEA) in the population under evaluation.

Table 2 presents the primary endpoint events that were reported within the first 30 days and 365 days for patients enrolled in the MAVErIC I & II studies. Table 3 details all other adverse events reported in the MAVErIC I and MAVErIC II studies at 30 days and at 365 days. Table 4 details the all-cause death rate of patients enrolled into the study that died between Day 0 - 365. No deaths were attributed to device malfunction or failure. All events are patient-based.

Table 2. Major Adverse Events Summary[1]

	Events to 30 Days		Events to 365 Days	
	MAVERIC I N = 99 n (%)	**MAVERIC II N = 399 n (%)**	**MAVERIC I N = 99 n (%)**	**MAVERIC II N = 399 n (%)**
Primary endpoint event: (Death, MI, Stroke to 30 days and Ipsilateral Stoke from 31 – 365 Days)	6 (6.1%)	21 (5.3%)	6 (6.1%)	22 (5.5%)
Any MAE (Death, MI, Stroke from 0 – 30 Days)	6 (6.1%)	21 (5.3%)	N/A	N/A
All-cause death[2]	1 (1.0%)	4 (1.0%)	1 (1.0%)	37 (9.3%)
Neurological	1 (1.0%)	2 (0.5%)	1 (1.0%)	4 (1.0%)
Cardiac	0 (0.0%)	2 (0.5%)	0 (0.0%)	20 (5.0%)
Other	0 (0.0%)	0 (0.0%)	0 (0.0%)	13 (3.3%)
Myocardial Infarction (Q Wave and Non-Q Wave)	1 (1.0%)	6 (1.5%)	1 (1.0%)	9 (2.3%)
Q Wave MI	0 (0.0%)	2 (0.5%)	0 (0.0%)	2 (0.5%)
Non-Q Wave MI	1 (1.0%)	4 (1.0%)	1 (1.0%)	8 (2.0%)
Stroke	5 (5.1%)	16 (4.0%)	5 (5.1%)	18 (4.5%)
Ipsilateral	4 (4.0%)	13 (3.3%)	4 (4.0%)	14 (3.5%)
Major Ischemic	3 (3.0%)	6 (1.5%)	3 (3.0%)	7 (1.8%)
Minor Ischemic	1 (1.0%)	5 (1.3%)	1 (1.0%)	6 (1.5%)
Major Hemorrhagic	1 (1.0%)	3 (0.8%)	1 (1.0%)	3 (0.8%)
Minor Hemorrhagic	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Non-ipsilateral (to 30 days)	1 (1.0%)	4 (1.0%)	1 (1.0%)	4 (1.0%)
Non-ipsilateral (31 - 365 days)	N/A	N/A	0 (0.0%)	1 (0.3%)
Non-ipsilateral (All)	1 (1.0%)	4 (1.0%)	1 (1.0%)	5 (1.3%)
Major Ischemic	0 (0.0%)	3 (0.8%)	0 (0.0%)	4 (1.0%)
Minor Ischemic	1 (1.0%)	0 (0.0%)	1 (1.0%)	0 (0.0%)
Major Hemorrhagic	0 (0.0%)	1 (0.3%)	0 (0.0%)	1 (0.3%)
Minor Hemorrhagic	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)

[1] All data based on ITT (intent-to-treat) population, which includes all subjects enrolled in the study regardless of whether they received a stent.

[2] Death: The Clinical Events Committee (CEC) adjudicated all deaths to determine if the death was defined as neurological (death due to a stroke, a complication of the procedure including bleeding, vascular repair or surgery or any death in which a neurological cause could not be excluded), or non-neurological (defined as death due to either a cardiac-related cause or due to another [other] cause).

Table 3. Other Adverse Events Summary[1]

	Events to 30 Days		Events to 365 Days	
	MAVERIC I N = 99 n (%)	MAVERIC II N = 399 n (%)	MAVERIC I N = 99 n (%)	MAVERIC II N = 399 n (%)
Target Lesion Revascularization (TLR)[2]	0 (0.0)	0 (0.0)	2 (2.0)	5 (1.3)
Surgery	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.3)
Percutaneous	0 (0.0)	0 (0.0)	2 (2.0)	4 (1.0)
Target Vessel Revascularization (not TLR)[3]	0 (0.0)	0 (0.0)	2 (2.0)	2 (0.5)
Surgery	0 (0.0)	0 (0.0)	1 (1.0)	0 (0.0)
Percutaneous	0 (0.0)	0 (0.0)	1 (1.0)	2 (0.5)
Blood and Lymphatic System Disorders[4]	0 (0.0)	14 (3.5)	0 (0.0)	31 (7.8)
Cardiac Disorders[5]	2 (2.0)	27 (6.8)	7 (7.1)	72 (18.0)
Congenital, Familial and Genetic Disorders[6]	0 (0.0)	1 (0.3)	0 (0.0)	2 (0.5)
Ear and Labyrinth Disorders[7]	0 (0.0)	1 (0.3)	0 (0.0)	1 (0.3)
Eye Disorders[8]	3 (3.0)	0 (0.0)	3 (3.0)	2 (0.5)
Gastrointestinal Disorders[9]	0 (0.0)	13 (3.3)	2 (2.0)	38 (9.5)
General Disorders and Administration Site Conditions[10]	0 (0.0)	15 (3.8)	2 (2.0)	55 (13.8)
Hepatobiliary Disorders[11]	0 (0.0)	0 (0.0)	0 (0.0)	2 (0.5)
Infections and Infestations[12]	0 (0.0)	18 (4.5)	3 (3.0)	33 (8.3)
Injury, Poisoning and Procedural Complications[13]	0 (0.0)	6 (1.5)	3 (3.0)	22 (5.5)
Investigations[14]	1 (1.0)	23 (5.8)	5 (5.1)	34 (8.5)
Metabolism and Nutrition Disorders[15]	0 (0.0)	1 (0.3)	1 (1.0)	11 (2.8)
Musculoskeletal and Connective Tissue Disorders[16]	0 (0.0)	2 (0.5)	1 (1.0)	5 (1.3)
Neoplasms Benign, Malignant and Unspecified (incl Cysts and Polyps)[17]	1 (1.0)	5 (1.3)	3 (3.0)	11 (2.8)
Nervous System Disorders[18]	5 (5.1)	30 (7.5)	9 (9.1)	50 (12.5)
Psychiatric Disorders[19]	0 (0.0)	6 (1.5)	0 (0.0)	9 (2.3)
Renal and Urinary Disorders[20]	0 (0.0)	8 (2.0)	3 (3.0)	24 (6.0)
Reproductive System and Breast Disorders[21]	0 (0.0)		0 (0.0)	1 (0.3)
Respiratory, Thoracic and Mediastinal Disorders[22]	1 (1.0)	8 (2.0)	3 (3.0)	28 (7.0)
Skin and Subcutaneous Tissue Disorders[23]	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.3)
Surgical and Medical Procedures[24]	2 (2.0)	9 (2.3)	16 (16.2)	47 (11.8)
Vascular Disorders[25]	5 (5.1)	28 (7.0)	10 (10.1)	70 (17.5)

[1] All data based on ITT population

[2] Target Lesion Revascularization: Any 'clinically driven' repeat percutaneous intervention (including angioplasty, stenting, endarterectomy, or thrombolysis) or carotid endarterectomy performed to open or increase the luminal diameter of the previously treated lesion.

[3] Target Vessel Revascularization: Any 'clinically driven' repeat percutaneous intervention (including angioplasty, stenting, endarterectomy or thrombolysis) or carotid endarterectomy of the previously treated vessel.

[4] Blood and Lymphatic System Disorders include: anemia, blood dyscrasia, coagulopathy, iron deficiency anemia, aggravated neutropenia, secondary anemia, thrombocytopenia

[5] Cardiac Disorders include: Angina pectoris (includes unstable), bradycardia (includes sinus), aortic valve stenosis, atrial fibrillation, AV block (includes complete), cardiac arrest, CAD, CHF, cardiac failure (includes congestive), cardiac tamponade, cardio-respiratory arrest, cardiomyopathy, cardiopulmonary failure, mitral valve incompetence, MI, myocardial ischemia, pulmonary edema (includes acute), coronary artery

insufficiency, sick sinus syndrome, tachycardia (includes supraventricular and ventricular), asystole (includes ventricular), ventricular fibrillation

[6]Congenital, Familial and Genetic Disorders include: Arterio-venous malformation, congenital atrial septal defect

[7]Ear and Labyrinth Disorders include: Labyrinthitis

[8]Eye Disorders include: Transient blindness, blindness (unilateral), blurred vision, reduced visual acuity, visual disturbances

[9]Gastrointestinal Disorders include: Abdominal hernia, abdominal pain, small intestinal perforation, colonic perforation, diverticulitis, diverticulum intestinal, duodenal ulcer (hemorrhage), esophageal obstruction, gastric ulcer (hemorrhage), gastritis, gastroduodenal ulcer, GI hemorrhage, hematemesis, lower GI hemorrhage, melena, mesenteric artery stenosis, discolored feces, nausea, pancreatitis, rectal hemorrhage, retroperitoneal hemorrhage, stomatitis, vomiting

[10]General Disorders and Administration Site Conditions include: Injection site hemorrhage, peripheral edema, adverse drug reaction, cardiac death, chest pain, death, fall, fatigue, migration of implant, multi-organ failure, peripheral edema, pyrexia, weakness

[11]Hepatobiliary Disorders include: cholecystitis, hepatic failure

[12]Infections and Infestations include: Bacteremia, cellulitis, colitis pseudomembranous, Infection, pneumonia, UTI, bacterial endocarditis, GU tract infections, groin infection, herpes zoster, klebsiella infection, pseudomonas infection, sepsis, upper respiratory tract infection, urosepsis, West Nile viral infection

[13]Injury, Poisoning and Procedural Complications include: Accidental overdose, coronary artery restenosis, fracture (includes femur, hip, humerus, lower limb, radius, upper limb), wound evisceration, hemothorax, intraoperative hypotension, postoperative anemia, postoperative hypotension, post-procedure diarrhea, post-procedure hemorrhage, road traffic accident, stent occlusion,

[14]Investigations include: Decreased hematocrit, decreased hemoglobin, coronary ateriogram, increased cardiac enzymes, abnormal cardiac stress test, increased blood creatinine, decreased blood pressure, increased blood pressure, positive fecal occult blood, prolonged coagulation time, increased intraocular pressure, medical observation, abnormal thoracic cavity drainage test

[15]Metabolism and Nutrition Disorders include: anorexia, dehydration, diabetes mellitus (includes inadequately controlled), diabetic ketoacidosis, electrolyte imbalance. Hyperglycemia, hyperkalemia, hyponatremia

[16]Musculoskeletal and Connective Tissue Disorders include: Pain in limb, back pain (includes aggravated), groin pain, peripheral swelling

[17]Neoplasms Benign, Malignant and Unspecified (incl Cysts and Polyps) include: cancer (includes bladder, breast, colon, gastric, liver, renal cell, pharyngeal, thyroid, ureteric, metastasis), lymphoma, carcinoid tumor, pharyngeal neoplasm

[18]Nervous System Disorders include: cerebrovascular accident, carotid artery aneurysm, carotid artery stenosis, hemaniopia, loss of consciousness, parathesis, convulsions, dizziness, memory impairment, neurological symptoms, aphasia, cerebral hemorrhage, cerebral infarction, clonic convulsion, coma, dementia of the Alzheimers type, dysarthria, embolic stroke, hemorrhagic transformation stroke, hemiparesis, hemiplegia, intraventricular hemorrhage, hypoesthesia, intracranial hemorrhage, ischemic stroke, spinal stenosis (includes lumbar), monoplegia, somnolence, subarachnoid hemorrhage, subdural hematoma, syncope, TIA, vasovagal attack, visual field defect

[19]Psychiatric Disorders include: Agitation, anxiety (includes aggravated), confusion, disorientation, mental status change

[20]Renal and Urinary Disorders include: Renal calculus, renal colic, renal failure (acute, aggravated and chronic), renal impairment, renal nephropathy, renal artery stenosis, urinary retention

[21]Reproductive System and Breast Disorders include: Uterovaginal prolapse

[22]Respiratory, Thoracic and Mediastinal Disorders include: Dyspnea, pulmonary hemorrhage, respiratory failure (includes acute), asthma (includes aggravated), chronic obstructive airway disease (includes aggravated), dyspnea (includes exertional) pleural effusion, aspiration pneumonia, pneumothorax, pulmonary embolism, pulmonary hypertension, respiratory arrest

[23]Skin and Subcutaneous Tissue Disorders include: Chronic skin ulcer

[24]Surgical and Medical Procedures include: Aortic aneurysm repair, aortic valve repair, aortic valve replacement, arterial bypass operation, cardiac pacemaker replacement, carotid endarterectomy, cerebrovascular surgery, cervical operation, colon surgery, CABG, coronary artery surgery, coronary revascularization, detached retina repair, endarterectomy, hernia repair, arthroplasty (includes hip, knee), hip surgery, malignant neoplasm excision, malignant breast lump removal, mitral valve replacement, mastectomy (partial), PTCA, PTA, polypectomy, renal vascularization surgery, shoulder surgery, spinal laminectomy, hospitalization, tracheostomy, cardiac valvuloplasty, vascular bypass grafts, whole blood transfusion

[25]Vascular Disorders include: Aortic aneurysm, arterial restenosis, arterial rupture, arterial stenosis, diabetic peripheral angiopathy, femoral arterial stenosis, femoral artery occlusion, gangrene, hematoma, hemorrhage, hypertension (includes aggravated), hypotension (includes aggravated, orthostatic), iliac artery stenosis, intermittent claudication, peripheral artery dissection, peripheral ischemia, peripheral vascular disorder, peripheral revascularization, poor peripheral circulation, vascular pseudoaneurysm, venous thrombosis (deep limb).

Table 4. Cause of Death[1, 2]

	MAVERIC I n (%)	**MAVERIC II n (%)**
0 - 30 days	**n = 99**	**n = 399**
Neurological	1 (1.0%)	2 (0.5%)
Cardiac	0	2 (0.5%)
Other	0	0
Total (0- 30 days)	**1 (1.0%)**	**4 (1.0%)**
31 - 365 days	**n = 99**	**n = 399**
Neurological	0	2 (0.5)
Cardiac	0	18 (4.5%)
Other: Infection Respiratory Cancer Renal Failure Stroke[3]	0	13 (3.3%%) 2 4 4 2 1
Total (31 - 365 days)	**0**	**33 (8.3)**
Total (0 - 365 days)	**1 (1.0%)**	**37 (9.3%)**

[1] All data based on ITT population.

[2] No reported deaths due to device malfunction or failure.

[3] Death due to progression of arteriosclerosis; does not meet study definition for neurological death.

6.2 Potential Adverse Events

Based on the literature and on clinical and commercial experience with carotid stents and embolic protection systems, the following list includes possible adverse events associated with these devices:

- Abrupt closure
- Acute myocardial infarction
- Allergic reaction (contrast medium; drug; stent or filter material)
- Amaurosis fugax
- Aneurysm or pseudoaneurysm in vessel or at vascular access site
- Angina/ Coronary ischemia
- Arrhythmia (including premature beats, bradycardia, atrial and/or ventricular tachycardia, atrial and/or ventricular fibrillation [VF])
- Asystole or bradycardia requiring placement of a temporary pacemaker
- Arteriovenous fistula
- Bleeding complications from anticoagulant or antiplatelet medication requiring transfusion or surgical intervention
- Cerebral edema
- Cerebral hemorrhage
- Cerebral ischemia
- Congestive heart failure (CHF)
- Death
- Detachment and/or implantation of a component of the system
- Dissection of blood vessel
- Distal embolic protection device thrombosis/ occlusion
- Emboli, distal (air, tissue, plaque, thrombotic material, stent)
- Emergent or urgent surgery (Carotid Endarterectomy [CEA])
- Emergent surgery to remove stent or distal embolic protection device
- Fever
- Hematoma at vascular access site, with or without surgical repair
- Hemorrhagic event, with or without transfusion
- Hyperperfusion syndrome
- Hypotension/Hypertension
- Infection, local or systemic including bacteremia or septicemia
- Ischemia/ infarction of tissue/ organ
- Pain (head/ neck)/ severe unilateral headache
- Pain at catheter insertion site
- Renal failure/ insufficiency secondary to contrast medium
- Restenosis of vessel in stented segment
- Seizure
- Stent/ distal embolic protection device entanglement/ damage
- Stent/ distal embolic protection device collapse or fracture
- Stent malapposition/ migration
- Stent thrombosis/ occlusion
- Stroke / cerebrovascular accident (CVA) / transient ischemic attack (TIA)
- Total occlusion of the carotid artery
- Vascular thrombosis/ occlusion at puncture site, treatment site, or remote site
- Vessel dissection, perforation or rupture
- Vessel spasm or recoil

Any device-related adverse event occurring that involves the Exponent Self-Expanding Carotid Stent with OTW Delivery System or any other product complaints should be reported immediately to Medtronic, Inc., Customer Service at (800) 465-5533.

7.0 CLINICAL STUDIES

The MAVErIC Trial: Evaluation of the Medtronic AVE Self-Expanding Carotid Stent System with Distal Protection in the Treatment of Carotid Stenosis was two prospective, non-randomized, multi-center, single arm clinical trials with the MAVErIC I study being a feasibility study and the MAVErIC II study being a pivotal study. These trials were performed to demonstrate the safety and efficacy of the Medtronic Exponent Self-Expanding Carotid Stent with Over-the-Wire (OTW) Delivery System and the GuardWire Temporary Occlusion & Aspiration System when used to treat high-risk surgical and non-surgical, symptomatic (> 50% stenosis) and asymptomatic (> 80% stenosis) subjects with disease in the common or internal carotid artery. MAVErIC I enrolled a total of 99 patients at 16 clinical sites in the U.S. and MAVErIC II enrolled 399 patients at 34 clinical sites in the U.S. for a combined total of 498 patients. An overview of the MAVErIC I & II Clinical Studies is presented in Table 5.

The primary endpoint is defined as any death, MI, or stroke at 30 days post-procedure plus the rate of ipsilateral stroke from 31 - 365 days.

Table 5. MAVERIC I & II Clinical Studies Overview

	MAVERIC I	MAVERIC II
Products Evaluated	Exponent Self-Expanding Carotid Stent with Over-the-Wire (OTW) Delivery System and the GuardWire Temporary Occlusion & Aspiration System	
Study Design	Non-randomized, multi-center, single-arm, prospective clinical trials.	
Sample Size	99 patients	399 patients
Number of Sites	16 in the U.S.	34 in the U.S.
Primary Endpoint	Any death, MI, stroke to 30 days and ipsilateral stroke from 31 – 365 days.	
Secondary Endpoints	***Safety:*** • Freedom from any stroke, MI or death at 30 days, freedom from target lesion revascularization at one year. ***Efficacy:*** • Acute success defined by: ◦ Lesion[1] ◦ device (stent delivery system and distal protection device)[2] ◦ procedure[3]	***Safety:*** • Major Adverse Events at 30 days post procedure defined as any stroke, MI, and / or death. ***Efficacy:*** • Acute success defined by: ◦ Lesion[1] ◦ device (stent delivery system and distal protection device)[2] ◦ procedure[3]. • Freedom from stroke at one year.
Study Hypothesis	Results meet the Performance Goal (PG) derived from historical carotid endarterectomy (CEA) data	
Patient Follow-Up[4]	• Neurologic evaluation by an independent neurologist at 30 days, 6 months and 365 days. • Clinical assessment via telephone call at 14 days and physical assessment (office visit) at 30 days, 6 months and 365 days, and annually for 3 years thereafter • Carotid duplex scans performed at 2 weeks and 365 days.	• Neurologic evaluation by an independent neurologist or NIHSS stroke-certified surrogate at 30 days, 6 months and 365 days. • Physical assessment (office visit) at 30 days, 6 months and 365 days, and annually for 3 years thereafter. • Carotid duplex scans performed at 4 weeks and 365 days.

[1] Lesion Success: Attainment of < 30% residual in-stent stenosis (by QCA) of the target lesion using any percutaneous method; if in-stent measurements not available, then in-lesion measurements were used; if in-lesion (by QCA) measurements not available, then visual estimates were used.

[2] Device (stent delivery system plus distal protection device) Success: Attainment of < 30% residual in-stent stenosis (by QCA) of the target lesion using the study devices; this measure is a union of Stent and Embolic Protection Device Success.

[3] Procedure Success: Attainment of residual in-stent stenosis (by QCA) of the target lesion and no in-hospital Major Adverse Events. If in-stent measurements not available, then in-lesion measurements (by QCA) were used; if in-lesion measurements not available, then visual estimates were used.

[4] Original protocol included a 5 year follow-up period; however, the follow-up was changed with a revision to the investigational plan reducing the follow-up to 3 years.

The study hypothesis was to demonstrate that the results of the Medtronic Vascular carotid stent clinical studies (MAVERIC I & II) met the 'Performance Goal' (PG) derived from historical carotid endarterectomy (CEA) data, demonstrating that the 1-year primary endpoint event rate was within the anticipated clinically reasonable range as noted in Section 7.1.

The protocol required regular patient follow-up by the treating physician and follow-up neurological assessment by either an independent neurologist or an NIH stroke scale-certified evaluator. Core laboratories provided independent assessments for angiographic, ultrasound and ECG. Medical monitors reviewed all safety data to ensure appropriate reporting of adverse events. A Clinical Events Committee adjudicated suspected primary endpoint events. A Data Safety Monitoring Board monitored adverse events to ensure patient safety.

7.1 Statistical Methods

The statistical analyses of the MAVErIC I and II studies were designed to demonstrate that the primary endpoint event rates were significantly less than a performance goal derived from available CEA literature, which represented the standard of care for carotid revascularization at the time of study initiation.

The one-year major event rate from CEA was estimated as ω_A x 11% + ω_C x 14%, where ω_C = the proportion of subjects with co-morbidity risk factors and ω_A = the proportion of subjects with anatomic risk factors. Based on this estimate, the study hypotheses were established as:

H_0: $\pi_{\text{Medtronic AVE}} \geq \omega_A$ x 11% + ω_C x 14% + 4%
H_A: $\pi_{\text{Medtronic AVE}} < \omega_A$ x 11% + ω_C x 14% + 4%,

where $\pi_{\text{Medtronic AVE}}$ = the one-year primary endpoint event rate and where ω_A and ω_C are based on the observed mix of subjects enrolled with each type of surgical risk factor. With a one-sided type I error of 5% and a type II error of 20%, the upper bound of the one-sided 95% confidence interval for the primary endpoint event rate must be less than the calculated performance goal for the null hypothesis to be rejected.

7.2 Eligibility Criteria Summary

The study population consisted of male and female patients at least 18 years of age, with discrete lesions in the common or internal carotid artery. Patients had to be high-risk candidates for surgery or non-surgical candidates; both symptomatic (≥ 50% stenosis) and asymptomatic (≥ 80% stenosis) patients were eligible. Symptomatic patients were defined as having:

- sudden numbness or weakness of face, arm or leg – especially on one side of the body
- sudden confusion, trouble speaking or understanding
- sudden trouble seeing in one or both eyes
- sudden trouble walking, dizziness, loss of balance or coordination
- sudden severe headache with no known cause

Patients were excluded from eligibility if they had an occurrence of non-disabling stroke, disabling stroke within 4 weeks of the index procedure or symptoms of a TIA or amaurosis fugax within 24 hours of the index procedure.

The inclusion criteria for MAVErIC I and MAVErIC II were similar. Key inclusion criteria included:

- Asymptomatic patient: meets angiographic and clinical inclusion criteria; carotid stenosis to be ≥ 80% by angiography, using NASCET methodology to determine degree of stenosis.
- Symptomatic patient: meets angiographic and clinical inclusion criteria; carotid stenosis to be ≥ 50% by angiography, using NASCET methodology to determine degree of stenosis **and** had one or more of the following criteria:
  a. Previous ipsilateral carotid endarterectomy; restenosis of previous CEA.
  b. Contralateral carotid artery occlusion of the ICA.
  c. Patient is status/ post radical neck dissection.
  d. Patient is status/ post radiation therapy to neck region.
  e. Surgically inaccessible lesions (e.g. target lesion above level of C2 or below the clavicle).
  f. Dissection of the common or internal carotid artery.
  g. Inability to extend neck (i.e. cervical osteoarthritis, mobility limitations).
  h. Tandem lesions ≥ 70% stenosis.
  i. Contralateral laryngeal nerve paralysis (palsy).
  j. Presence of tracheostomy stoma.
  k. Patient is at risk for wound infection due to medical status.
  l. Patients > 80 years of age.
  m. Myocardial infarction within previous 6 weeks and current need for carotid artery revascularization.
  n. COPD with FEV_1 < 30% (predicted).
  o. Unstable angina defined as rest pain with electrocardiogram (ECG) changes.
  p. History of liver failure with elevated prothrombin time.
  q. New York Heart Association (NYHA) Class III or IV heart failure or ejection fraction < 30%.
  r. Two or more major diseased coronary arteries with > 70% stenosis at the time of index procedure in patients with a history of angina that have not been revascularized.
- Target ICA vessel reference diameter had to be ≥ 5.5 mm and ≤ 9.5 mm by angiography.

Specific Inclusion Criteria for the Exponent Carotid Stent and the OTW Delivery System and the GuardWire® Temporary Occlusion & Aspiration System

- The vessel distal to the lesion had to have an absence of excessive tortuosity and an available segment that was straight or mildly angulated ≥ 4.0 cm by angiography in the distal ICA (prior to the petrous portion of the vessel) in which to place the embolic protection device.
- The diameter of the vessel in the distal ICA (straight or mildly angulated) prior to the petrous portion of the vessel had to be ≥ 4.5 mm and ≤ 5.5 mm by angiography.

Table 6 gives the numbers of patients included in the MAVERIC I and II studies based on risk factors.

Table 6. Patient Risk Factors for Inclusion

RISK FACTORS	MAVERIC I (N = 99 Patients) % (n/N)	MAVERIC II (N = 399 Patients) % (n/N)
ANATOMICAL		
Previous Carotid Endarterectomy	59.6% (59/99)	28.6% (114/399)
Contralateral Carotid Artery Occlusion	5.1% (5/99)	8.5% (34/399)
Previous Radical Neck Dissection Or Radiation Therapy To Neck Region	11.1% (11/99)	9.3% (37/399)
Target Lesion Above C-2 (Level Of Jaw)	7.1% (7/99)	10.3% (41/399)
Low Cervical Carotid Lesions	1.0% (1/99)	1.0% (4/399)
Dissection	1.0% (1/99)	0.0% (0/399)
Inability To Extend Neck (i.e. Cervical Osteoarthritis, Mobility Limitations)	8.1% (8/99)	7.3% (29/399)
Tandem Lesions ≥ 70% Stenosis	2.0% (2/99)	1.3% (5/399)
Contralateral Laryngeal Palsy	1.0% (1/99)	1.3% (5/399)
At Risk For Wound Infection	5.1% (5/99)	3.3% (13/399)
Tracheostomy	1.0% (1/99)	1.5% (6/399)
CO-MORBIDITY		
Patients > 80 Years Of Age	10.1% (10/99)	35.3% (141/399)
Two Or More Major Diseased Coronary Arteries With >70% Stenosis At The Time Of Index Procedure In Patients With A History Of Angina	NA	15.3% (61/399)
Myocardial Infarction Within Previous 6 Weeks	0.0% (0/99)	0.8% (3/399)
NYHA Class III Or IV Heart Failure	15.2% (15/99)	12.8% (51/399)
Unstable Angina (Defined As Resting Pain With ECG Changes)	3.0% (3/99)	3.3% (13/399)
History Of Liver Failure With Elevated Prothrombin Time	0.0% (0/99)	0.3% (1/399)
Requires Concurrent CABG, AAA Repair Or Peripheral Vascular Surgery	0.0% (0/99)	0.0% (0/399)
COPD With FEV1 < 30% Predicted	3.0% (3/99)	1.8% (7/399)

7.3 Description of Patients Evaluated

Table 7 summarizes patient follow-up at the endpoint evaluation time points.

Table 7. Patient Follow-up

	MAVERIC I (N = 99 patients) % (n/N)	MAVERIC II N = 399 patients) % (n/N)
30 Days		
Patients Enrolled	100.0% (99/99)	100.0% (399/399)
Cumulative Death	1.0% (1/99)	1.0% (4/399)
Cumulative Withdrawn or LTF	0.0% (0/99)	1.5% (6/399)
Patients Evaluable	99.0% (98/99)	97.5% (389/399)
Patients Evaluated[1]	97.0% (96/99)	94.5% (377/399)
Neurological Evaluation[2]	88.9% (88/99)	89.0% (355/399)
Ultrasound Evaluation[3]	90.9% (90/99)	86.4% (345/399)
Other Clinical Evaluation Only[4]	8.1% (8/99)	5.5% (22/399)
365 Days		
Cumulative Death	1.0% (1/99)	9.3% (37/399)
Cumulative Withdrawn or LTF	1.0% (1/99)	7.5% (30/399)
Patients Evaluable	98.0% (97/99)	83.2% (332/399
Patients Evaluated	96% (95/99)	79.7% (318/399)
Neurological Evaluation	78.8% (78/99)	72.7% (290/399
Ultrasound Evaluation	79.8% (79/99)	73.2% (292/399)
Other Clinical Evaluation Only	17.2% (17/99)	7.0% (28/399)

[1] Patients evaluated defined as a complete 30 or 365 day contact form
[2] Neurological assessment defined as a complete NIH Stroke Scale Form
[3] Ultrasound evaluation took place at 14 days for MAVERIC I
[4] Other Clinical Evaluation Only defined as a complete 30 or 365 day contact form with no neurological evaluation

7.4 Description of Patient Demographics

Table 8 summarizes patient demographic information for the 99 patients enrolled into the MAVERIC I trial and the 399 patients enrolled into the MAVERIC II trial.

Table 8. Patient Demographic Information, MAVERIC I & II

Patient Characteristic	MAVERIC I	MAVERIC II
Age (yrs)		
Mean ± SD (N)	69.26 ± 10.20 (99)	74.08 ± 9.39 (399)
Range (Min, Max)	43.00, 89.00	41.00, 95.00
Gender, % (n/N)[1]		
Male	57.6% (57/99)	58.6% (234/399)
Female	42.4% 42/99	41.4% (165/399)
Race, % (n/N)[1]		
White	89.9% (89/99)	91.2% (364/399)
Black	5.1% (5/99)	3.8% (15/399)
Hispanic	3.0% (3/99)	3.0% (12/399)
Asian	1.0% (1/99)	0.8% (3/399)
Other	1.0% (1/99)	1.3% (5/399)

Patient Characteristic	MAVERIC I	MAVERIC II
Medical History, % (n/N)[1]		
Left Ventricular Function		
Normal (ejection fraction > 55%)	45.0% (27/60)	51.6% (126/244)
Mildly Impaired (ejection fraction 46% to 55%)	25.0% (15/60)	12.3% (30/244)
Moderately Impaired (ejection fraction 30% to 45%)	15.0% (9/60)	22.1% (54/244)
Severely Impaired (ejection fraction < 30%)	15.0% (9/60)	13.9% (34/244)
Clinical Congestive Heart Failure	26.5% (26/98)	24.8% (96/387)
Peripheral Vascular Disease	52.6% (51/97)	44.0% (171/389)
Gastrointestinal/ Genitourinary Bleeding	8.2% (8/97)	5.3% (21/397)
Diabetes Mellitus	27.3% (27/99)	34.1% (136/399)
History of Liver Failure	0.0% (0/97)	0.3% (1/386)
Dyslipidemia Requiring Medication	68.7% (68/99)	70.8% (281/397)
History of Hypertension	91.8% (90/98)	87.9% (350/398)
Uncontrolled Systemic Hypertension	2.2% (2/91)	1.5% (6/393)
Cigarette Smoking (Ever)	72.7% (72/99)	67.3% (266/395)
Family History of Premature Atherosclerosis	41.9% (26/62)	NC
Significant Aortic Arch Atherosclerosis	1.1% (1/93)	NC
History of Cardiac Arrhythmia	17.7% (17/96)	NC
Severe Aortic/Mitral Valvular Disease	7.4% (7/95)	NC
Renal Insufficiency	11.1% (11/99)	NC
Clinical COPD	3.4% (3/88)	NC
Coronary Artery Disease	66.3% (63/95)	NC
Unstable Angina	3.1% (3/98)	NC
Current Smoking	19.4% (19/98)	NC
Previous Q wave or Non-Q wave MI	28.0% (26/93)	27.8% (107/385)
Prior Cardiovascular Procedures, % (n/N)[1]		
Previous PTCA (coronary)	23.5% (23/98)	NC
Previous AVR	3.0% (3/99)	NC
Previous MVR	1.0% (1/99)	NC
Previous CABG	33.3% (33/99)	NC
Neurological History, % (n/N)[1]		
Previous PTA (Carotid)	0.0% (0/97)	2.3% (9/399)
Previous CEA	60.6% (60/99)	33.6% (134/399)
History of TIA	23.5% (23/98)	29.3% (115/392)
History of Stroke	21.9% (21/96)	22.5% (89/396)
Target Lesion Location, % (n/N)[1]		
Right Carotid		
Common	6.2% (6/97)	3.1% (12/389)
Internal	44.3% (43/97)	48.3% (188/389)
Left Carotid		
Common	11.% (11/97)	4.9% (19/389)
Internal	38.1% (37/97)	43.7% (170/389)
Baseline Target Lesion Characteristics, % (n/N)[1]		
Lesion location, %		
Contiguous	43.3% (42/97)	50.1% (194/387)
Remote	48.5% (47/97)	37.7% (146/387)
Sequential	8.2% (8/97)	12.1% (47/387)

Patient Characteristic	MAVERIC I	MAVERIC II
Distance from Ostium (mm)		
Mean ± SD (N)	6.01 ± 7.87 (97)	3.63 ± 5.73 (387)
Minimum, maximum	0.00, 42.40	0.00, 34.40
Lesion Length (mm)		
Mean ± SD (N)	14.71 ± 6.99 (96)	15.17 ± 6.83 (387)
Minimum, maximum	2.29, 33.71	4.56, 39.73
Discrete (< 10 mm), % (n/N)	26.0% (25/96)	25.1% (97/387)
Tubular (10 to 20 mm), % (n/N)	53.1% (51/96)	54.0% (209/387)
Diffuse (≥ 20 mm), % (n/N)	20.8% (20/96)	20.9% (81/387)
Lesion Eccentricity, % (n/N)	35.1% (34/97)	29.2% (113/387)
Thrombus, % (n/N)		
None	93.8% (91/97)	94.3% (365/387)
Possible	6.2% (6/97)	5.7% (22/387)
Mild	0.0% (0/97)	0.0% (0/387)
Moderate	0.0% (0/97)	0.0% (0/387)
Large	0.0% (0/97)	0.0% (0/387)
Total occlusion	0.0% (0/97)	0.0% (0/387)
Access tortuosity (any), % (n/N)	2.1% (2/97)	3.9% (15/387)
Distal tortuosity (any), % (n/N)	33.0% (32/97)	34.9% (135/387)
Calcification (unilateral or bilateral), % (n/N)	49.5% (48/97)	53.7% (208/387)
Ulceration, % (n/N)	23.7% (23/97)	27.4% (106/387)
Aneurysm, % (n/N)	6.2% (6/97)	3.1% (12/387)
Baseline TIMI flow, % (n/N)		
0, 1	0.0% (0/59)	0.0% (0/221)
2	3.4% (2/59)	5.9% (13/221)
3	96.6% (57/59)	94.1% (208/221)

NC = Value not captured

Source: CS002-01, Revision A, Section 14.1., Tables 14.1.3, 14.1.4.
CS007-01, Revision B, Section 14.1., Tables 14.1.3., 14.1.4

[1]Denominators indicate the total number of patients with available data for the related parameter.

Table 9 summarizes quantitative angiographic findings for the MAVERIC I trial.

Table 9. Quantitative Angiographic Findings, MAVERIC I

Parameter / Statistic	Time point	
	Pre-procedure	Final Assessment
Reference diameter		
Common carotid (mm)		
Mean ± SD (N[1])	6.64 ± 1.33 (97)	6.65 ± 1.33 (96)
Minimum, maximum	3.60, 10.00	3.66, 10.00
Internal carotid (mm)		
Mean ± SD (N[1])	4.56 ± 0.88 (97)	4.70 ± 0.93 (96)
Minimum, maximum	2.78, 6.51	3.02, 7.75
RVD (mm)		
Mean ± SD (N[1])	4.99 ± 1.32 (97)	5.12 ± 1.31 (96)
Minimum, maximum	2.78, 9.17	3.02, 8.89
MLD (mm)		
Mean ± SD (N[1])	1.48 ± 0.76 (97)	3.81 ± 0.75 (96)
Minimum, maximum	0.21, 3.30	1.57, 5.59
% Diameter stenosis		
Mean ± SD (N[1])	70.59 ± 12.30 (97)	23.41 ± 13.51 (96)
Minimum, maximum	38.93, 94.05	2.58, 63.99

Source: CS002-01, Revision A, Section 14.2, Table 14.2.4.

[1]Denominators indicate the total number of patients with available data for the related parameter.

Table 10 summarizes quantitative angiographic findings for the 399 patients enrolled into the MAVERIC II trial.

Table 10. Quantitative Angiographic Findings, MAVERIC II

Parameter / Statistic	Time point	
	Pre-procedure	Final Assessment
Reference diameter		
Common carotid (mm)		
Mean ± SD (n)[1]	6.51 ± 1.19 (387)	6.48 ± 1.19 (385)
Minimum, maximum	4.11, 10.45	4.03, 10.73
Internal carotid (mm)		
Mean ± SD (n)[1]	4.25 ± 0.79 (387)	4.32 ± 0.74 (385)
Minimum, maximum	2.22, 6.83	2.66, 6.82
RVD (mm)		
Mean ± SD (n)[1]	4.40 ± 0.93 (387)	4.46 ± 0.89 (385)
Minimum, maximum	2.38, 9.55	2.66, 9.25
MLD (mm)		
Mean ± SD (n)[1]	1.34 ± 0.54 (387)	3.64 ± 0.72 (385)
Minimum, maximum	0.34, 3.62	1.79, 5.84
% Diameter stenosis		
Mean ± SD (n)[1]	69.60 ± 9.88 (387)	17.45 ± 12.42 (385)
Minimum, maximum	36.07, 90.96	-25.54, 60.98

Source: CS007-01, Revision B, Section 14.2, Table 14.2.4.

[1]Denominators indicate the total number of patients with available data for the related parameter.

7.5 Clinical Results Summary

As demonstrated in Table 2, Section 6.1, the primary endpoint events (defined as any death, MI, or stroke reported from 0 to 30 days and any ipsilateral stroke reported from 31 – 365 days) occurred in 6 patients in the MAVERIC I clinical trial, for a rate of 6.1% at both 30 days and 365 days. In the MAVERIC II trial, primary endpoint events occurred in 21 patients at 30 days, for a rate of 5.3%, and occurred in 22 patients at 365 days for a rate of 5.5%. Table 3 details all other adverse events reported in the MAVERIC I and MAVERIC II studies at 30 days and at 365 days. Table 4 details the all-cause death rate of patients enrolled into the study that died between 0 days and 365 days. No deaths were attributed to device malfunction or failure. Table 11 below details the safety and efficacy measures for the ITT population.

Tables 12 and 13 display results of primary endpoint event hypothesis testing (imputation approach) for the MAVERIC I and II studies analysis populations (AP). The 95% one-sided upper confidence interval of the MAVERIC primary endpoint event rate is less than the hypothesized value (ω_A*11% + ω_C*14% + 4%), indicating the MAVERIC primary endpoint event rate is significantly less than the hypothesized value at the one-sided 0.05 level of significance.

Table 11. Safety and Efficacy Measures[1]

Safety and Efficacy Measures	MAVERIC I (N = 99) % (n/N)	MAVERIC II (N = 399) % (n/N)
Primary Endpoint		
Death, MI, Stroke to 30 days and Ipsilateral Stroke from 31-365 Days	6.1% (6/99)	5.5% (22/399)
30 Day Death	1.0% (1/99)	1.0% (4/399)
30 Day MI	1.0% (1/99)	1.5% (6/399)
30 Day Stroke	5.1% (5/99)	4.0% (16/399)
31-365 Day Ipsilateral Stroke	0.0% (0/99)	0.3% (1/399)
Secondary Endpoint		
Any MAE to 30 days (Death, MI, Stroke)	6.1% (6/99)	5.3% (21/399)
TLR	2.0% (2/99)	1.3% (5/399)
TVR	2.0% (2/99)	0.5% (2/399)
Primary Patency at 1 year	85.9% (85/99)	92.1% (363/394)
Technical Success	80.8% (80/99)	87.0% (347/399)
Acute Procedure Success	81.8% (81/99)	88.6% (350/395)

[1] All data based on ITT population

The Kaplan-Meier estimates for freedom-from-primary endpoint events to 365 days for the MAVERIC I & II trials for all ITT patients, all symptomatic patients and all asymptomatic patients are found in Tables 12, 13, 14, 15, 16, 17, 18 & 19.

Table 12. MAVERIC I Statistical Analysis for Primary Endpoint Events

	MAVERIC I (N = 99 Patients)	Weighted PG	Weighted PG + 0.04	Upper Bound of 1-Sided 95% CI
Primary Endpoint Events to 365 days[1] (n = 98)	6.1% (6/98)	11.765%	15.765%	11.73%

[1] Data based on analysis population (AP), defined as ITT population minus patients lost to follow-up.

A primary endpoint event is defined as Death, MI, Stroke to 30 days and Ipsilateral Stroke from 31-365 Days.
The PG (Performance Goal) for the AP population was based on 25 patients with high risk comorbid factors and 73 patients with high risk anatomic factors. The PG 1 year complication rate for high risk anatomic patients is 11% and the PG 1 year complication rate for high risk comorbid patients is 14%.

Table 13. MAVERIC II Statistical Analysis for Primary Endpoint Events

	MAVERIC II (N = 399 Patients)	Weighted PG	Weighted PG + 0.04	Upper Bound of 1-Sided 95% CI
Primary Endpoint Events to 365 days[1] (n = 375)	5.9% (22/375)	12.728%	16.728%	8.27%

[1] Data based on AP

A primary endpoint event is defined as Death, MI, Stroke to 30 days and Ipsilateral Stroke from 31-365 Days.
The PG (Performance Goal) for the AP population was based on 216 patients with high risk comorbid factors and 159 patients with high risk anatomic factors (2 patients with missing high risk data were considered high risk anatomic). The PG 1 year complication rate for high risk anatomic patients is 11% and the PG 1 year complication rate for high risk comorbid patients is 14%.

Table 14. MAVERIC I
Kaplan-Meier Estimate for Freedom-from-Primary Endpoint Events to 365 Days[1]

	Time Intervals (days)										
	0*	1-30	31-60	61-120	121-150	151-180	181-240	241-270	271-300	301-330	331-365
MAVERIC I											
# Entered	99	96	93	93	93	93	93	92	92	92	92
# Censored	0	0	0	0	0	0	1	0	0	0	2
# Incomplete	0	0	0	0	0	0	0	0	0	0	0
# Events	3	3	0	0	0	0	0	0	0	0	0
Cumulative % Event-Free	97.0%	93.9%	93.9%	93.9%	93.9%	93.9%	93.9%	93.9%	93.9%	93.9%	93.9%
SE	1.7%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%

[1] All data based on ITT population

* 0=Peri-procedure
# Entered – The number of patients entering the interval
# Censored – The number of patients who prematurely withdrew without an event in the interval
# Incomplete – The number of patients who died in the interval without event
# Events – The number of patients with event in the interval
Cumulative % Event-Free– Kaplan-Meier Estimate of % of patients without an event at the end of the interval from Peri-procedure
SE - Kaplan-Meier Estimate of % standard error

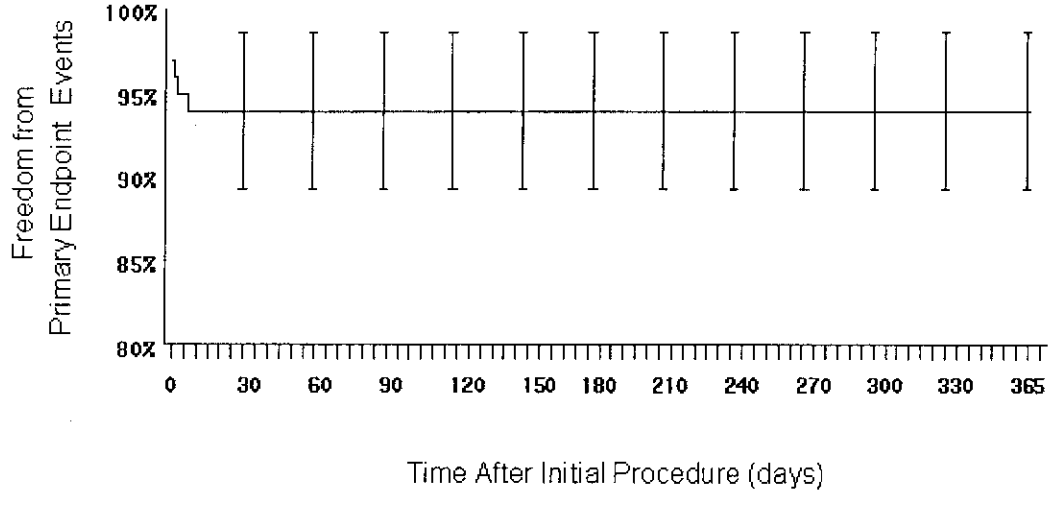


Table 15. MAVErIC I
Kaplan-Meier Estimate for Freedom-from-Primary Endpoint Events to 365 Days
Population: All Symptomatic Patients

	Time Intervals (days)										
	0*	1-30	31-60	61-120	121-150	151-180	181-240	241-270	271-300	301-330	331-365
MAVErIC I											
# Entered	38	35	33	33	33	33	33	33	33	33	33
# Censored	0	0	0	0	0	0	0	0	0	0	1
# Incomplete	0	0	0	0	0	0	0	0	0	0	0
# Events	3	2	0	0	0	0	0	0	0	0	0
Cumulative % Event-free	92.1%	86.8%	86.8%	86.8%	86.8%	86.8%	86.8%	86.8%	86.8%	86.8%	86.8%
SE	4.4%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%

* 0=Peri-procedure
# Entered – The number of patients entering the interval
# Censored – The number of patients who prematurely withdrew without an event in the interval
# Incomplete – The number of patients who died in the interval without event
# Events – The number of patients with event in the interval
Cumulative % Event-free– Kaplan-Meier Estimate of % of patients without an event at the end of the interval from Peri-procedure
SE - Kaplan-Meier Estimate of % standard error

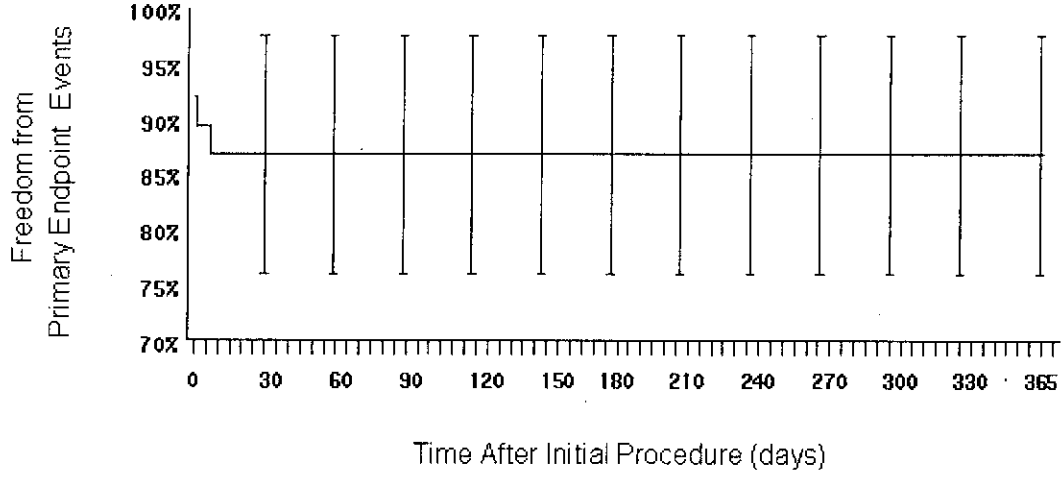


Table 16. MAVERIC I
Kaplan-Meier Estimate for Freedom-from- Primary Endpoint Events to 365 Days
Population: All Asymptomatic Patients

	Time Intervals (days)										
	0*	1-30	31-60	61-120	121-150	151-180	181-240	241-270	271-300	301-330	331-365
MAVERIC I											
# Entered	59	59	58	58	58	58	58	57	57	57	57
# Censored	0	0	0	0	0	0	1	0	0	0	1
# Incomplete	0	0	0	0	0	0	0	0	0	0	0
# Events	0	1	0	0	0	0	0	0	0	0	0
Cumulative % Event-free	100%	98.3%	98.3%	98.3%	98.3%	98.3%	98.3%	98.3%	98.3%	98.3%	98.3%
SE	0.0%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%

* 0=Peri-procedure
# Entered – The number of patients entering the interval
# Censored – The number of patients who prematurely withdrew without an event in the interval
# Incomplete – The number of patients who died in the interval without event
# Events – The number of patients with event in the interval
Cumulative % Event-free– Kaplan-Meier Estimate of % of patients without an event at the end of the interval from Peri-procedure
SE - Kaplan-Meier Estimate of % standard error

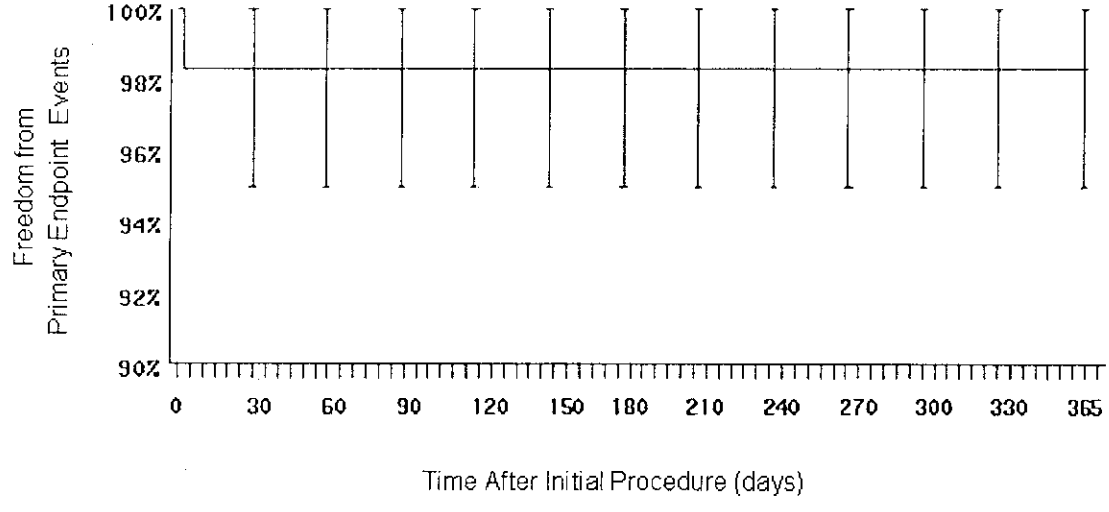


Table 17. MAVERIC II
Kaplan-Meier Estimate for Freedom-from- Primary Endpoint Events to 365 Days[1]

	Time Intervals (days)										
	0*	1-30	31-60	61-120	121-150	151-180	181-240	241-270	271-300	301-330	331-365
MAVERIC II											
# Entered	399	390	369	367	361	359	353	341	336	333	326
# Censored	0	9	2	2	0	3	4	3	0	1	9
# Incomplete	0	0	0	4	2	3	7	2	3	6	2
# Events	9	12	0	0	0	0	1	0	0	0	0
Cumulative % Event-free	97.7%	94.7%	94.7%	94.7%	94.7%	94.7%	94.4%	94.4%	94.4%	94.4%	94.4%
SE	0.7%	1.1%	1.1%	1.1%	1.1%	1.1%	1.2%	1.2%	1.2%	1.2%	1.2%

[1] All data based on ITT population

* 0=Peri-procedure
# Entered – The number of patients entering the interval
# Censored – The number of patients who prematurely withdrew without an event in the interval
# Incomplete – The number of patients who died in the interval without event
# Events – The number of patients with event in the interval
Cumulative % Event-free– Kaplan-Meier Estimate of % of patients without an event at the end of the interval from Peri-procedure
SE - Kaplan-Meier Estimate of % standard error

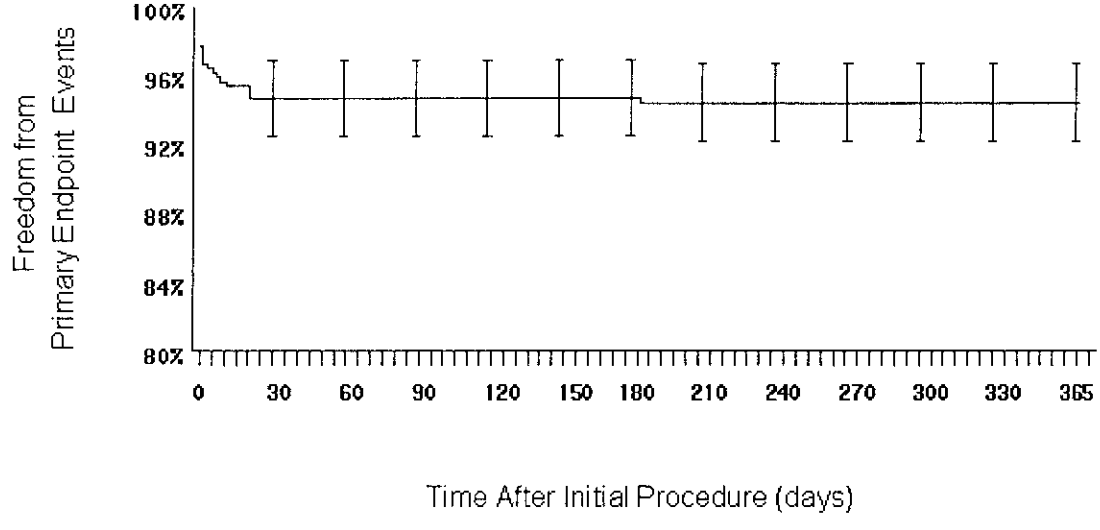


Table 18. MAVERIC II
Kaplan-Meier Estimate for Freedom-from-Primary Endpoint Events to 365 Days
Population: All Symptomatic Patients

	Time Intervals (days)										
	0*	1-30	31-60	61-120	121-150	151-180	181-240	241-270	271-300	301-330	331-365
MAVERIC II											
# Entered	175	171	158	157	153	153	150	145	142	142	139
# Censored	0	5	1	1	0	1	3	2	0	0	5
# Incomplete	0	0	0	3	0	2	2	1	0	3	0
# Events	4	8	0	0	0	0	0	0	0	0	0
Cumulative % Event-free	97.7%	93.1%	93.1%	93.1%	93.1%	93.1%	93.1%	93.1%	93.1%	93.1%	93.1%
SE	1.1%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%

* 0=Peri-procedure
# Entered – The number of patients entering the interval
# Censored – The number of patients who prematurely withdrew without an event in the interval
# Incomplete – The number of patients who died in the interval without event
# Events – The number of patients with event in the interval
Cumulative % Event-free– Kaplan-Meier Estimate of % of patients without an event at the end of the interval from Peri-procedure
SE - Kaplan-Meier Estimate of % standard error

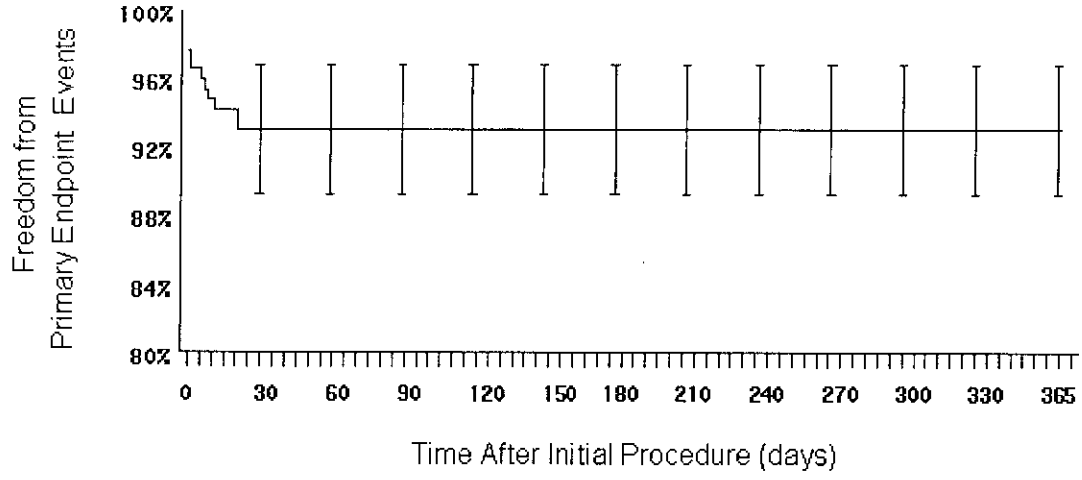
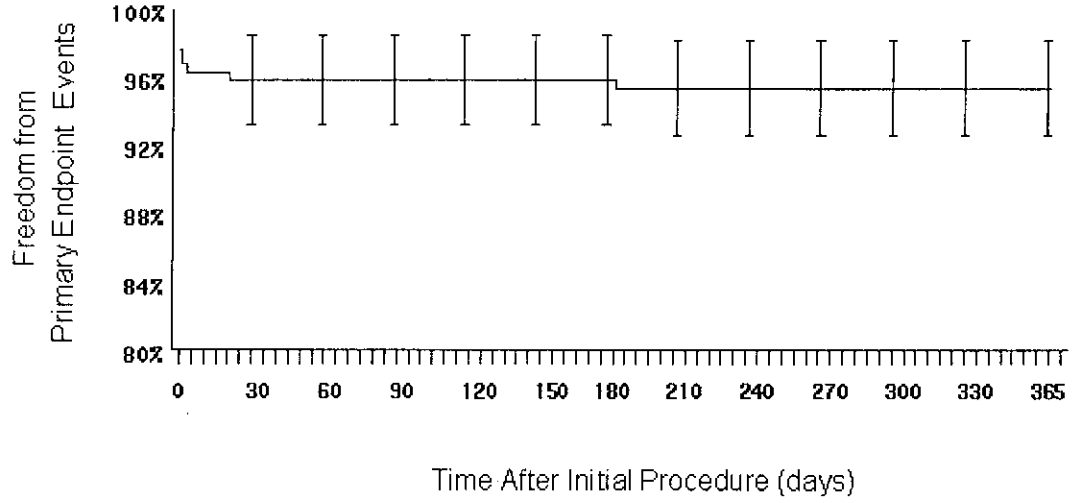


Table 19. MAVERIC II
Kaplan-Meier Estimate for Freedom-from-Primary Endpoint Events to 365 Days
Population: All Asymptomatic Patients

	Time Intervals (days)										
	0*	1-30	31-60	61-120	121-150	151-180	181-240	241-270	271-300	301-330	331-365
MAVERIC II											
# Entered	219	214	207	206	204	202	199	192	190	187	183
# Censored	0	3	1	1	0	2	1	1	0	1	4
# Incomplete	0	0	0	1	2	1	5	1	3	3	2
# Events	5	4	0	0	0	0	1	0	0	0	0
Cumulative % Event-free	97.7%	95.9%	95.9%	95.9%	95.9%	95.9%	95.4%	95.4%	95.4%	95.4%	95.4%
SE	1.0%	1.3%	1.3%	1.3%	1.3%	1.3%	1.4%	1.4%	1.4%	1.4%	1.4%

* 0=Peri-procedure
# Entered – The number of patients entering the interval
# Censored – The number of patients who prematurely withdrew without an event in the interval
# Incomplete – The number of patients who died in the interval without event
# Events – The number of patients with event in the interval
Cumulative % Event-free– Kaplan-Meier Estimate of % of patients without an event at the end of the interval from Peri-procedure
SE - Kaplan-Meier Estimate of % standard error



Results

Data from the MAVErIC Phase I (feasibility) and Phase II (pivotal) studies, in which the Exponent Carotid Stent System was investigated, include the 30-day primary endpoint event rate on 498 patients (Phase I: 99 patients, 6.1% primary endpoint event rate; Phase II: 399 patients, 5.3% primary endpoint event rate; see **Table 2**) and the 365-day primary endpoint event rate on a total of 473 patients (Phase I: 98 patients, 6.1%; Phase II: 375 patients, 5.9%) in the analysis population (see **Table 2**). In the ITT population of MAVErIC I, the probability of stroke at 365 days post procedure was 5.1% based on Kaplan-Meier estimates. In the ITT population of MAVErIC II, the probability of stroke at 365 days post procedure was 4.6% based on Kaplan-Meier estimates. One patient in the feasibility study and 2 patients in the pivotal study suffered a stroke and subsequently died during the combined in- and out-of-hospital 30-day follow-up period. There were no cardiac-related deaths in the MAVErIC Phase I study and 2 cardiac-related deaths in the MAVErIC Phase II study during the combined in- and out-of-hospital 30-day follow-up period.

In the MAVErIC I trial, 6 out of the 99 enrolled subjects followed to one year were observed to have at least one primary endpoint event. This leads to an overall primary endpoint event rate of 6.1%. In the MAVErIC II trial, 22 out of the 399 enrolled subjects followed to one year were observed to have at least one primary endpoint event. This leads to an overall primary endpoint event rate of 5.5%. In all cases, the 95% one-sided upper confidence interval of the MAVErIC primary endpoint event rate is less than the hypothesized value of 17%, indicating the MAVErIC primary endpoint event rate is significantly less than the hypothesized value, at the one-sided 0.05 level of significance.

8.0 CLINICAL USE INFORMATION

Only physicians who have received appropriate training and are familiar with the principles, clinical applications, complications, side effects and hazards commonly associated with carotid stent placement should use this device.

WARNING: *Do not use after the "Use By" date specified on the package. Assure that the device has been properly stored in a cool, dark, dry place prior to use.*

WARNING: *The Exponent Self-Expanding Carotid Stent with OTW Delivery System is supplied sterile and is intended for single-use only. Do not use if the package is open, damaged or if the temperature indicator on the inside pouch is black. Do not reuse. Do not resterilize as this can compromise device performance and increase the risk of cross-contamination due to inappropriate reprocessing.*

8.1 Stent Size Determination

Careful stent sizing is important to successful stenting. The available stent diameters are 6.0 mm, 7.0 mm, 8.0 mm, 9.0 mm, and 10.0 mm each in stent lengths of 20 mm, 30 mm, and 40 mm. A minimum "interference" fit of 0.5 mm between the vessel and the stent is recommended in order to achieve optimum sizing and stent expansion of the self-expanding stent. For example, select a 6.0 mm stent to treat a 4.5 - 5.5 mm diameter vessel. Select a 7.0 mm stent to treat a 5.5 - 6.5 mm diameter vessel. The mean percentage of foreshortening for all stent sizes is less than 6%. The shortest stent length consistent with total lesion coverage is optimal. Should adequate coverage by one stent be impossible, a second Exponent stent may be used.

The delivery system has a 135 cm working length and is compatible with 0.014" embolic protection devices and guidewires. Introducer sheaths and guiding catheters with a minimum inner diameter of 0.081" are compatible with the 6.0 mm and 7.0 mm diameter stents. Introducer sheaths and guiding catheters with a minimum inner diameter of 0.091" are compatible with the 8.0 mm, 9.0 mm and 10.0 mm diameter stents.

WARNING: *The Exponent Carotid Stent System is contraindicated for use with lesions in the ostium of the common carotid artery.*

WARNING: *Appropriate sizing of the stent to the vessel is required to reduce the possibility of stent migration.*

Table 20. Exponent Carotid Stent Diameters

Unconstrained Stent Diameter (mm)	Stent Length (mm)	Reference Vessel Diameter (mm)
6.0 mm	20, 30, 40	4.5 - 5.5
7.0 mm	20, 30, 40	5.5 - 6.5
8.0 mm	20, 30, 40	6.5 - 7.5
9.0 mm	20, 30, 40	7.5 - 8.5
10.0 mm	20, 30, 40	8.5 - 9.5

8.2 Materials Required

- Appropriately sized vascular sheath compatible with the vascular anatomy having an I.D. of 0.081" (2.06 mm) for 6.0 mm and 7.0 mm diameter stents, and 0.091" (2.31 mm) for 8.0 mm, 9.0 mm, and 10.0 mm diameter stents. See Table 1 for minimum guiding catheter or sheath size inner diameter. Guiding catheter or sheath length should not interfere with stent delivery system requirements.
- Rotating Hemostasis Valve (RHV) ≥ 0.096" (2.44 mm) is optional. The Exponent Self-Expanding Carotid Stent with the OTW Delivery System is not recommended for use with bleedback control hemostatic valves.
- Optional balloon dilatation catheter.
- Medtronic carotid distal embolic protection system with 0.014" guidewire.
- Two to three syringes (10 - 20 cc).
- 500 cc heparinized normal saline solution (sterile).

CAUTION: *The Exponent Self- Expanding Carotid Stent with the OTW Delivery System is not compatible with guidewires or embolic protection devices larger than 0.014" (0.037 mm).*

8.3 Periprocedural Care

During the MAVErIC clinical studies, aspirin (ASA) 325 mg orally was given along with either ticlopidine 1000 mg ***or*** clopidogrel 300 mg to patients within 24 hours of the procedure when possible. After the procedure, ASA 325 mg was given indefinitely along with either clopidogrel 75 mg q.d. or ticlopidine 250 mg b.i.d. for a minimum of four weeks post procedure. Ticlopidine or clopidogrel was continued at the discretion of the physician.

Whenever possible, clopidogrel or ticlopidine was started the day before the procedure. Patients on a pre-existing regimen of clopidogrel or ticlopidine were medicated at the physician's discretion. If clopidogrel or ticlopidine were given within 12 hours before the start of the procedure, treatment with a GP IIbIIIa inhibitor is recommended.

WARNING: *Appropriate antiplatelet and anticoagulation therapy should be administrated pre- and post-procedure as suggested in these instructions and carried out in accordance with the MAVErIC protocols; however, all medication regimens are at the discretion of the physician. Special consideration should be given to those patients with recently active gastritis or peptic ulcer disease.*

8.4 Pre-procedure

Patient preparation and sterile precautions should be the same as for any angioplasty procedure. The placement of the carotid stent in a stenotic or obstructed carotid artery must be done in a procedure room with angiography capabilities. Angiography should be performed to map out the extent of the lesion and the collateral flow. If thrombus is present, do not proceed with stent deployment. Access vessels must be sufficiently patent or sufficiently recanalized to proceed with further intervention.

8.5 Inspection Prior to Use

1. Inspect the temperature indicator on the inner pouch.

WARNING: *Do not use if the temperature indicator has changed from a gray square to a black square.*

CAUTION: *The Medtronic Vascular Exponent® Self-Expanding Carotid Stent with OTW Delivery System is only to be used in conjunction with a Medtronic Vascular Carotid Distal Embolic Protection System with 0.014" guidewire.*

2. Remove the Exponent Self-Expanding Carotid Stent with OTW Delivery System from its protective packaging. Lay the device flat. Take care not to kink the shaft of the delivery catheter system.

   CAUTION: *Carefully inspect the Exponent Self-Expanding Carotid Stent with OTW Delivery System to verify that the device has not been damaged in shipment. Do not use damaged equipment.*

   CAUTION: *The delivery system has an internal hypotube. Take care to avoid unnecessary handling which may kink or damage the delivery system. Keep the delivery system as straight as possible and the delivery handle stationary during deployment. Do not use if device is kinked.*

3. Inspect the delivery system sheath to verify that it has not been damaged during shipment and that the stent does not overlap the proximal marker. Ensure that the stent is fully covered by the sheath.

   CAUTION: *Special care must be taken not to handle or in any way disrupt the stent on the delivery system. This is especially important during delivery system removal from packaging, placement over the distal embolic protection device wire and advancement through an RHV and guiding catheter hub.*

   CAUTION: *The stent on the delivery system is intended to perform as a system. Do not remove the stent from the delivery system as removal may damage the stent. If removed, the stent cannot be put back on the delivery system.*

4. Ensure that the slider button is in the locked position at the front of the handle. Verify that the stent is the correct diameter and length by reading the specifications on the handle at the strain relief portion of the delivery system. Do not use if any defects are noted.

   CAUTION: *Leave the slider button in the locked position until the stent is ready to be deployed.*

8.6 Preparation

CAUTION: *Do not expose the delivery system to organic solvents as structural integrity and / or function may be impaired.*

8.6.1 Delivery System Preparation

1. Fill a 10 cc syringe with heparinized normal saline and inject the saline through the luer fittings at the proximal end of the handle for both the guidewire lumen and the stent-sleeve lumen. Flush until fluid is observed exiting the delivery system at the distal end of the catheter.

CAUTION: *Ensure that the stent delivery system is fully flushed with heparinized saline prior to use. Do not use the delivery system if flush is not visible exiting at the distal end of the sheath.*

2. Gently slide the EZ-Place valve relief forward over the delivery system shaft until it stops. Do not force the forward movement.
3. Keep the device straight and flat to avoid kinking the shaft.

8.6.2 Distal Embolic Protection System Preparation

The Exponent Self-Expanding Carotid Stent with OTW Delivery System is indicated for use in conjunction with a Medtronic distal carotid embolic protection system. Please refer to the Instructions for Use for the specific embolic protection system for information on device preparation and placement.

WARNING: *Allow for and maintain adequate distance between the distal embolic protection system and the stent delivery system or the deployed stent in order to prevent possible entanglement. If entanglement occurs between the distal embolic protection device and the stent, surgical conversion for removal of the stent should be considered.*

WARNING: *The distal embolic protection device should be in place prior to insertion of either a predilatation balloon or stent delivery system into the patient.*

8.6.3 Lesion Preparation

WARNING: *Administer heparin dose sufficient to maintain an ACT of ≥ 250 secs to prevent thrombus formation on the devices.*

CAUTION: *Venous access should be available during carotid stenting to manage bradycardia and/ or hypotension by either pacemaker placement or pharmaceutical intervention, if needed.*

CAUTION: *The Exponent Self-Expanding Carotid Stent with OTW Delivery System must be used with a guiding catheter or introducer sheath to maintain adequate support of the 0.014" guidewire or embolic protection device throughout the procedure.*

CAUTION: *Use with bleedback control hemostatic valves is not recommended.*

CAUTION: *When catheters are in the body they should only be manipulated under fluoroscopy. Radiographic equipment that provides high-quality images is needed.*

WARNING: *Maintain continuous flush while removing and reinserting devices on the guidewire or embolic protection device. Perform all exchanges slowly to prevent air embolism or trauma to the artery.*

1. If needed, pre-dilate the lesion with an appropriate size balloon dilatation catheter to a minimum of 2.5 mm after the distal protection device is in place beyond the lesion.

   Note: *If no predilatation balloon is utilized, there must be a minimum luminal opening of 2.5 mm to enable passage of the stent delivery system.*

2. Maintain the embolic protection device wire and withdraw the balloon dilatation catheter.

8.7 Delivery Procedure

1. If lesion pre-dilatation has been performed, remove the balloon catheter and back-load the delivery system onto the 0.014" (0.36 mm) embolic protection device wire. A 300cm embolic protection device wire must be used. The wire will exit the delivery system at the luer.

   CAUTION: *The delivery system is not designed for use with a power injector. Use of a power injector may adversely affect device performance.*

   CAUTION: *For best device performance, the guidewire exit port should remain within the guiding catheter or sheath.*

2. Gently slide the EZ-Place valve relief over the outer shaft until it stops.
3. Keep the device flat to avoid kinking the shaft.
4. Insert the delivery system through the rotating hemostatic valve adapter.
5. Tighten the hemostatic valve adapter over the EZ-Place valve relief to ensure that the hemostatic valve adapter does not clamp down on the outer sheath and impede its movement. The EZ-Place valve relief also limits back flow of blood.

   CAUTION: *Do not over-tighten the hemostatic valve adapter over the EZ-Place valve relief. Do not aspirate blood through the hemostatic valve adapter when the EZ-Place Valve Relief is within the hemostatic valve. This could result in air embolism.*

6. To avoid kinking of the stent delivery system, stabilize the hub of the guiding catheter or introducer sheath, hold the catheter shaft just proximal to the E-Z Place Valve Relief and use short strokes to advance the delivery catheter over the immobilized guidewire of the distal protection device.

   CAUTION: *If resistance is met during delivery system introduction, the system should be withdrawn and another system used.*

7. Advance the stent and delivery system forward under fluoroscopic guidance to the lesion site.

8.8 Stent Deployment

WARNING: *Ensure optimal positioning of the stent prior to deployment. Once deployment is initiated, the stent cannot be repositioned or recaptured. Stent retrieval methods (use of additional wires, snares and/ or forceps) may result in additional trauma to the carotid vasculature and/ or vascular access site. Complications may include death, stroke, bleeding, hematoma, or pseudoaneurysm.*

CAUTION: Once stent placement has been initiated, *do not attempt to pull a partially expanded stent back through the guiding catheter or sheath as dislodgement of the stent from the delivery system may occur.*

1. Confirm the stent position angiographically prior to deployment. Adjust position if necessary.

2. The stent delivery system is designed to deploy the stent using one hand. While holding the handle stationary with one hand, unlock the stent release mechanism (slider button) on the delivery handle with the thumb by rotating the button toward the center (left) of the handle. See Figure 1.

   Note: *Ensure that the delivery system is straight and not coiled and remove any slack in the system. Keep the delivery handle stationary during deployment. Do not hold the outer sheath of the delivery catheter during deployment. It must be free to move.*

3. Deploy the stent by slowly pulling back on the slider button. Continue to pull back on slider button until the slider mechanism reaches the end of the slot in the handle. This will retract the external constraining (outer) sheath and allow the stent to be deployed.

   Note: *If significant resistance is encountered during pullback of the slider button and before stent release is initiated, re-lock the slider button into the handle and remove the system. Once deployment is initiated, the stent cannot be recovered by the sheath.*

   CAUTION: *In the event of partial delivery of the stent as the result of the inability to fully deploy the stent, remove the entire delivery system from the patient. This may result in damage to the vessel wall and may require surgical intervention.*

4. Once the stent is deployed, carefully withdraw the distal tip of the delivery system through the stent. Return the deployment button to the locked position. This will re-sheath the delivery catheter and allow for removal of the system into the guiding catheter or sheath. Remove the delivery system from the patient.

5. Under fluoroscopy, confirm that the stent has been deployed at the target lesion.

6. If additional stent-to-wall apposition is desired or to facilitate the use of other interventional devices, the stent can be post-dilated with a dilatation catheter. Do not expand the stent beyond its unconstrained maximum diameter as stated on the label and in Table 1. Post-dilate as needed in accordance with the compliance chart accompanying the selected balloon catheter.

   CAUTION: *When more than one stent is required to cover the lesion or if there are multiple lesions, the distal lesion should be stented first followed by stenting of the proximal lesion. Stenting in this order obviates the need to cross the proximal stent in order to place the distal stent and reduces the chance of dislodging stents that have already been placed.*

   CAUTION: *If overlap of sequential stents is necessary, the amount of overlap should be kept to a minimum (approximately 5 mm). In no instance should more than two (2) stents overlap.*

   CAUTION: *Care must be exercised when crossing a newly depolyed stent with other interventional devices to avoid disrupting the stent geometry and placement of the stent.*

   WARNING: *Overstretching of the artery may result in rupture and life-threatening bleeding.*

8.9 Post-Stent Placement

1. Following stent placement, an angiogram should be performed to confirm vessel patency and percent stenosis remaining in the vessel lumen.

   WARNING: *The stent may cause a thrombus, distal embolization or may migrate from the site of implant down the arterial lumen. Appropriate sizing of the stent to the vessel is required to reduce the possibility of stent migration. In the event of thrombosis of the expanded stent, thrombolysis and PTA should be attempted.*

2. Upon completion of the angiogram, the embolic protection device should be removed in accordance with the instructions for use with that device.

3. Patients should be put on an appropriate regimen of anticoagulants / antiplatelets such as that described in Section 8.3 .

   WARNING: *In the event of complications such as infection, pseudoaneurysm, or fistulization, surgical removal of the stent may be required.*

   WARNING: *The long-term performance (> 1 year) of the Exponent Self-Expanding Carotid Stent has not been established.*

9.0 PATIENT INFORMATION

In addition to these Instructions for Use, the Exponent Self-Expanding Carotid Stent with OTW Delivery System is packaged with a Patient Implant Card for the patient that contains specific information about the Exponent Self-Expanding Carotid Stent. All patients should keep this card in their possession at all times for the procedure / stent identification.

A Patient Guide, which includes information on carotid artery disease and the carotid stent implant procedure using distal embolic protection, is available from Medtronic Vascular upon request. Please contact Customer Service at 1-(888) 283-7868 to obtain copies.

10.0 HOW SUPPLIED

Sterile: This device is sterilized with electron beam radiation. Non-pyrogenic.

Contents: One (1) Exponent Self-Expanding Carotid Stent with OTW Delivery System

Storage: Store in a dry, dark, cool place.

11.0 PATENTS

Protected by United States Patents 5,203,774; 6,306,141. Additional patents pending in the United States as well as other countries.

DISCLAIMER OF WARRANTY

NOTE: ALTHOUGH THE CAROTID STENT SYSTEM, HEREAFTER REFERRED TO AS "PRODUCT," HAS BEEN MANUFACTURED UNDER CAREFULLY CONTROLLED CONDITIONS, MEDTRONIC INC. AND ITS RESPECTIVE AFFILIATES (COLLECTIVELY "MEDTRONIC") HAVE NO CONTROL OVER CONDITIONS UNDER WHICH THIS PRODUCT IS USED. MEDTRONIC, THEREFORE, DISCLAIMS ALL WARRANTIES, BOTH EXPRESSED AND IMPLIED, WITH RESPECT TO THE PRODUCT, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. MEDTRONIC SHALL NOT BE LIABLE TO ANY PERSON OR ENTITY FOR ANY MEDICAL EXPENSES OR ANY DIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES CAUSED BY ANY USE, DEFECT, FAILURE OR MALFUNCTION OF THE PRODUCT, WHETHER A CLAIM FOR SUCH DAMAGES IS BASED UPON WARRANTY, CONTRACT, TORT OR OTHERWISE. NO PERSON HAS ANY AUTHORITY TO BIND MEDTRONIC TO ANY REPRESENTATION OR WARRANTY WITH RESPECT TO THE PRODUCT.

The exclusions and limitations set out above are not intended to and should not be construed so as to contravene mandatory provisions of applicable law. If any part or term of this Disclaimer of Warranty is held to be illegal, unenforceable or in conflict with applicable law by a court of competent jurisdiction, the validity of the remaining portions of this Disclaimer of Warranty shall not be affected.

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Alleviating Pain · Restoring Health · Extending Life

EXPONENT® SELF-EXPANDING CAROTID STENT with RAPID EXCHANGE (RX) DELIVERY SYSTEM

Instructions for Use

(IFU)

CAUTION: Federal (USA) law restricts this device to sale by or on the order of a physician.

CAUTION: CAREFULLY READ ALL INSTRUCTIONS PRIOR TO USE. FAILURE TO OBSERVE ALL WARNINGS AND PRECAUTIONS MAY RESULT IN COMPLICATIONS.

CONTENTS

This device is supplied in sterile condition. All materials inside the sterile barrier pouch (the delivery system and stent, as shown in Figure 1, as well as the stylet, tray, and retaining hoop) are sterile. The external surface of the sterile barrier pouch, as well as the product carton, should not be considered sterile.

1.0 DEVICE DESCRIPTION

The Medtronic Vascular Exponent® Self-Expanding Carotid Stent with RX Delivery System is designed to deliver a self-expanding stent to the carotid arteries via a sheathed delivery system. The self-expanding stent is constructed of a nickel titanium alloy (Nitinol), and is compressed and loaded into the delivery system. The stent is delivered to the intended lesion site and then expanded by retraction of a protective sheath and remains as a permanent vessel scaffolding implant. Upon deployment, the stent imparts an outward radial force on the arterial lumen to establish patency. The stents are available in diameters of 6.0 mm, 7.0 mm, 8.0 mm, 9.0 mm, and 10.0 mm and lengths of 20 mm, 30 mm, and 40 mm.

The Exponent RX delivery system is comprised of an inner shaft and an outer shaft that is attached to a slider button inside a molded polymer handle. The delivery system has a 135 cm working length and is compatible with 0.014" guidewires and embolic protection devices. A valve relief (EZ-place) component is mounted on the delivery system's proximal outer shaft, which permits movement of the delivery system under the valve relief while a hemostatic valve adapter is closed around the valve relief. Introducer sheaths and guiding catheters with a minimum inner diameter of 0.087" are recommended for use with the Exponent Self-Expanding Carotid Stent with RX Delivery System.

Attached to the proximal end of the handle and inner shaft is a single-arm luer, which permits flushing of the coaxial area around the stent. A strain relief is attached to the distal end of the handle to help prevent kinking of the proximal end of the device at the area of the handle. In addition to a radiopaque marker located just proximal to the stent, the delivery system has a second radiopaque marker located approximately 1 mm proximal to the distal end of the delivery system. This radiopaque marker helps to delineate the tip of the catheter relative to an embolic protection device (typically used in carotid stenting procedures). A pictorial representation of the Exponent Rapid Exchange Delivery System is presented in Figure 1.

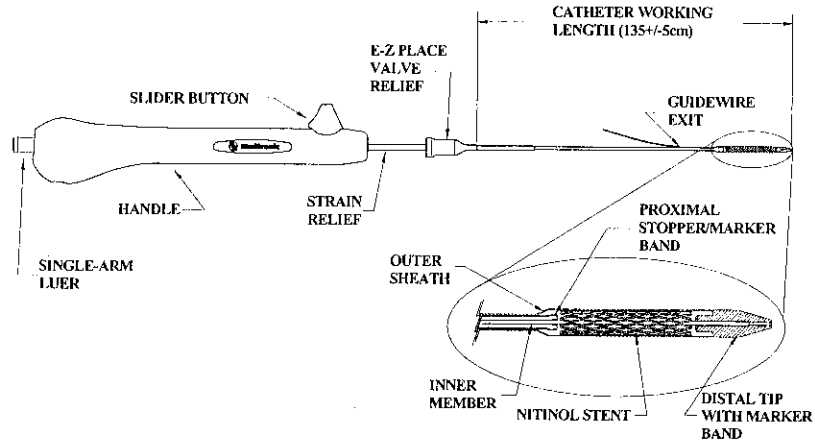


Figure 1. Exponent® Self-Expanding Carotid Stent with Rapid Exchange (RX) Delivery System

Table 1. Medtronic Vascular Exponent® Self-Expanding Carotid Stent with RX Delivery System Product Information

Unconstrained Stent Diameter (mm)	Stent Length (mm)	Reference Vessel Diameter (mm)	Required Sheath or Guiding Catheter I.D.
6.0 mm	20, 30, 40	4.5 - 5.5	0.087" (2.21 mm)
7.0 mm	20, 30, 40	5.5 - 6.5	0.087" (2.21 mm)
8.0 mm	20, 30, 40	6.5 - 7.5	0.087" (2.21 mm)
9.0 mm	20, 30, 40	7.5 - 8.5	0.087" (2.21 mm)
10.0 mm	20, 30, 40	8.5 - 9.5	0.087" (2.21 mm)

2.0 INDICATIONS

The Medtronic Vascular Exponent Self-Expanding Carotid Stent with RX Delivery System, used in conjunction with the Medtronic Vascular embolic protection system, is indicated for improving carotid luminal diameter in patients at high risk for adverse events from carotid endarterectomy who require carotid revascularization and meet the criteria outlined below.

1. Patients with neurological symptoms and ≥ 50% stenosis of the common or internal carotid artery by either ultrasound or angiogram OR patients without neurological symptoms and ≥ 80% stenosis of the common or internal carotid artery by either ultrasound or angiogram, AND
2. Patients having a vessel with reference diameters between 4.5 mm and 9.5 mm at the target lesion.

3.0 CONTRAINDICATIONS

The Exponent Self-Expanding Carotid Stent with RX Delivery System is contraindicated for use in:

- Patients in whom anticoagulant and/ or antiplatelet therapy is contraindicated.
- Patients with severe vascular tortuosity or anatomy that would preclude the safe introduction of a guide catheter, sheath, embolic protection device, or stent delivery system.
- Patients with known hypersensitivity to Nitinol (nickel-titanium).
- Patients with uncorrected bleeding disorders.
- Lesions in the ostium of the common carotid artery.

4.0 WARNINGS

Only physicians who have received appropriate training and are familiar with the principles, clinical applications, complications, side effects, and hazards commonly associated with carotid stent placement should use this device.

4.1 General

- The safety and efficacy of the Exponent Self-Expanding Carotid Stent System has not been demonstrated with embolic protection devices other than the Medtronic Vascular GuardWire Temporary Balloon Occlusion and Aspiration System
- When multiple stents are required, stent materials should be of similar composition.
- Refer to the Instructions for Use supplied with any interventional devices to be used in conjunction with the Exponent Self-Expanding Carotid Stent with RX Delivery System for their intended uses, contraindications, and potential complications.
- As with any type of vascular implant, infection secondary to contamination of the stent may lead to rupture, thrombosis, or pseudoaneurysm.
- Stenting across a major bifurcation may prevent or hinder future diagnostic or therapeutic procedures.
- Long-term (> 1 year) performance of the Exponent Self-Expanding Carotid Stent System has not been established.
- The appropriate anticoagulation and antiplatelet therapy should be administrated pre- and post-procedure as suggested in these instructions. Special considerations should be given to those patients with recent active peptic ulcer disease or gastritis.
- Surgical removal of the stent may be required in the event of complications such as infection, pseudoaneurysm, or fistulization.
- Caution is advised when tracking the stent system through any previously deployed devices to avoid the risk of entanglement.

4.2 Patient Selection

The safety and effectiveness of the Exponent Self-Expanding Carotid Stent with RX Delivery System have NOT been established in patients with the following characteristics:

Patient Characteristics

- Pregnant patients or patients under the age of 18.
- Patients at low to moderate risk for adverse events from carotid endarterectomy.
- Patients with aneurismal dilation immediately proximal to or distal to the lesion.
- Patients experiencing acute ischemic neurological stroke or patients who experienced a stroke within 4 weeks prior to the procedure.
- Patients with coagulopathies.
- Patients with perforated vessels as evidenced by extravasation of contrast media.
- Patients with poor renal function who may be at high risk for a contrast medium reaction, in the opinion of the physician.
- Patients with arteriovenous malformations of the territory of the target carotid artery.
- Patients with an intracranial mass lesion (i.e., abscess, infection, or tumor) or aneurysm > 5 mm.
- Patients with bilateral stenosis.

Lesion Characteristics

- Patients with evidence of intraluminal thrombus thought to increase the risk of distal embolization and/ or plaque fragmentation.
- Patients with a total occlusion of the target vessel.
- Patients having highly calcified lesions resistant to PTA.
- Patients whose lesion(s) may require the use of two or more stents.

Access Characteristics

- Patients in whom vascular access is not possible.
- Patients with known peripheral vascular tortuosity, supra-aortic tortuosity, or carotid artery tortuosity that precludes safe use of catheter-based tecniques.

4.3 Device Use

- This device is intended for single-use only. DO NOT use the product after the 'Use By' date noted on the packaging.
- Package contains one self-expanding carotid stent system. Store at room temperature.
- DO NOT re-use. DO NOT resterilize, as this can compromise device performance and may increase the risk of cross-contamination due to inappropriate reprocessing. Sterilized by e-beam irradiation.
- DO NOT use this product if the temperature indicator on the inner pouch is black.
- Ensure optimal positioning of the stent prior to deployment. Once deployment is initiated the stent cannot be repositioned or recaptured. Stent retrieval methods and the use of additional wires, snares, and/ or forceps may result in additional trauma to the carotid vessel or the vascular access site. Complications may result in bleeding, hematoma, pseudoaneurysm, stroke or death.
- Overstretching of the artery may result in rupture and life-threatening bleeding.
- Implanting a stent may lead to dissection of the vessel distal to and/ or proximal to the stent and may cause acute vessel closure requiring additional intervention such as carotid endarterectomy, placement of additional stents or further dilatation.
- Appropriate stent sizing is required to reduce the possibility of stent migration. The stent may migrate from the site of implant, embolize or cause a thrombus distally from the implant site down the arterial lumen. Maintain the patient's activated clotting time (ACT) at > 250 seconds throughout the stent delivery and implant procedure to prevent thrombus formation on the stent delivery system. In the event of thrombosis of the expanded stent, thrombolysis and PTA may be attempted. If IIb / IIIa inhibitors are used, maintain the ACT at > 200 seconds.
- Maintain a continuous flush while removing and inserting devices over the guidewire of the embolic protection device. Perform all device exchanges slowly in order to prevent air embolism or trauma to the artery.
- Allow for and maintain an adequate distance between the embolic protection system and the stent delivery system and/ or the deployed stent in order to prevent possible entanglement of the two systems. If entanglement should occur and cannot be corrected, surgical intervention should be considered.

5.0 PRECAUTIONS

- Venous access should be available during carotid intervention to manage bradycardia or tachycardia by either medical therapy or temporary pacing. .

5.1 Stent Handling – Precautions

- Special care must be taken not to handle or in any way disrupt the stent on the delivery system. This is most important during catheter removal from packaging, placement over the guidewire and advancement through a rotating hemostasis valve (RHV) adapter and guiding catheter hub.
- Carefully inspect the Exponent Self-Expanding Carotid Stent with RX Delivery System to verify that the device has not been damaged in shipment. Do not use damaged product.
- Take care to avoid unnecessary handling which may kink or damage the delivery system. Keep the delivery system as straight as possible and the delivery handle stationary during deployment. Do not use if device is kinked.
- Do not hold the shaft of the delivery catheter during deployment. Ensure the EZ Place valve relief is being utilized to assure freedom of movement of the outer sheath during deployment.
- Do not expose the delivery system to organic solvents as structural integrity and/ or device function may be impaired.
- Do not remove the stent from its delivery system, as removal may damage the stent. If removed, the stent cannot be put back onto the delivery system.
- The stent and the delivery system are designed to perform as an integrated system to be used only as designed.

5.2 Stent Placement – Precautions

- Ensure that the stent delivery system is fully flushed with heparinized saline prior to use. Do not use the delivery system if the flush is not observed exiting at the distal end of the catheter.
- Use with bleedback control hemostatic valves is not recommended.
- The Exponent Self-Expanding Carotid Stent with RX Delivery System is not compatible with guidewires or embolic protection devices larger than 0.014" (0.36 mm).
- The Exponent Self-Expanding Carotid Stent with RX Delivery System must be used with a guiding catheter or sheath to maintain adequate support of the 0.014" guidewire or embolic protection device throughout the procedure.
- If resistance is met during introduction or delivery of the stent delivery system, or during retraction of the outer sheath, the system should be carefully withdrawn and another system used.
- When catheters are in the body, they should be manipulated only under fluoroscopy. Radiographic equipment that provides high quality images is needed.
- Leave the slider button locked in place until the stent is ready to be deployed.
- Do not attempt to pull a partially deployed stent back through the guiding catheter or sheath; dislodgement of the stent from the delivery system may occur.
- Prior to stent deployment, remove all slack from the delivery system.
- Withdraw the stent system carefully if resistance is encountered during movement through the sheath or during initial retraction of the sheath.
- The delivery system is not designed for use with power injection. Use of power injection may adversely affect device performance.
- When more than one stent is required to cover the lesion or if there are multiple lesions, the distal lesion should be stented first followed by stenting of the proximal lesion. Stenting in this order obviates the need to cross the proximal stent for placement of the distal stent and reduces the chance of dislodging stents that have already been placed.

- Although not studied in the clinical trial, if overlap of sequential stents is necessary, the amount of overlap should be kept to a minimum (approximately 5 mm). In no instance should more than 2 stents overlap.

Note: The full effect of overlapping multiple stents in the carotid system has not been established.

5.3 Post- Implant – Precautions

- Care must be exercised when crossing a newly deployed stent with other interventional devices to avoid disrupting the stent geometry and placement of the stent.
- In the event of thrombosis of the expanded stent, thrombolysis and PTA should be attempted.

5.3.1 MRI Compatibility

Non-clinical testing has demonstrated that the Exponent Self-Expanding Carotid Stent is Magnetic Resonance (MR) Conditional. It can be scanned under the following conditions:

- Static magnetic field strength of 3.0 Tesla or less
- Spacial gradient field strength of 720 Gauss/cm or less
- Maximum whole-body-averaged specific absorption rate (SAR) of 3.0 W/kg for 15 minutes of scanning

In non-clinical testing, the Exponent Carotid Stent produced a temperature rise of less than 0.8° C at a maximum MR system reported whole body averaged specific absorption rate (SAR) of 3.0 W/kg for 15 minutes of MR scanning in a 3-Tesla (Excite, Software G3.0-052B General Electric Medical Systems, Milwaukee WI) active-shielded, horizontal field scannner.

MR image quality may be compromised if the area of interest is in the exact same area or relatively close to the position of the Exponent Carotid Stent. Therefore, it may be necessary to optimize MR imaging parameters for the presence of this metallic implant. The effect of performing MRI procedures using higher levels of RF energy on a patient with the stent has not been determined. The effect of performing MRI procedures on patients with overlapping stents has not been determined.

6.0 ADVERSE EVENTS

6.1 Observed Adverse Events

Note: Although the Exponent Self-Expanding Carotid Stent with RX Delivery System was not studied in the MAVERIC I and II multi-center clinical studies, the stent is identical to those used in the studies.

The Exponent Self-Expanding Carotid Stent with Over-the-Wire (OTW) Delivery System and the GuardWire® Temporary Occlusion & Aspiration System were evaluated for the treatment of high-risk surgical patients with lesions in the common carotid and internal carotid artery that are amenable to percutaneous treatment with stenting. A total of 498 patients were enrolled into two separate trials as follows:

- MAVERIC I, a feasibility study, evaluated the Over-the-Wire (OTW) Exponent Self-Expanding Carotid Stent System with the GuardWire Temporary Occlusion & Aspiration System and included 99 patients. The primary objective of this study was to evaluate the safety and efficacy in treating carotid stenosis in patients at high risk for carotid endarterectomy (CEA) in the population under evaluation.

- MAVERIC II, a pivotal study, evaluated the Over-the-Wire (OTW) Exponent Self-Expanding Carotid Stent System and the GuardWire Temporary Occlusion & Aspiration System expanded to include 399 patients. The primary objective of the study was the same as MAVERIC I in treating carotid stenosis in patients at high risk for carotid endarterectomy (CEA) in the population under evaluation.

Table 2 presents the primary endpoint events that were reported within the first 30 days and 365 days for patients enrolled in the MAVERIC I & II studies. Table 3 details all other adverse events reported in the MAVERIC I and MAVERIC II studies at 30 days and at 365 days. Table 4 details the all-cause death rate of patients enrolled into the study that died between Day 0 - 365. No deaths were attributed to device malfunction or failure. All events are patient-based.

Table 2. Major Adverse Events Summary[1]

	Events to 30 Days		Events to 365 Days	
	MAVERIC I N = 99 n (%)	MAVERIC II N = 399 n (%)	MAVERIC I N = 99 n (%)	MAVERIC II N = 399 n (%)
Primary Endpoint Event: (Death, MI, Stroke to 30 days and Ipsilateral Stroke from 31 – 365 days)	6 (6.1%)	21 (5.3%)	6 (6.1%)	22 (5.5%)
Any MAE (Death, MI, Stroke) from 0 – 30 days	6 (6.1%)	21 (5.3%)	N/A	N/A
All-cause death[2]	1 (1.0%)	4 (1.0%)	1 (1.0%)	37 (9.3%)
Neurological	1 (1.0%)	2 (0.5%)	1 (1.0%)	4 (1.0%)
Cardiac	0 (0.0%)	2 (0.5%)	0 (0.0%)	20 (5.0%)
Other	0 (0.0%)	0 (0.0%)	0 (0.0%)	13 (3.3%)
Myocardial Infarction (Q Wave and Non-Q Wave)	1 (1.0%)	6 (1.5%)	1 (1.0%)	9 (2.3%)
Q Wave MI	0 (0.0%)	2 (0.5%)	0 (0.0%)	2 (0.5%)
Non-Q Wave MI	1 (1.0%)	4 (1.0%)	1 (1.0%)	8 (2.0%)
Stroke	5 (5.1%)	16 (4.0%)	5 (5.1%)	18 (4.5%)
Ipsilateral	4 (4.0%)	13 (3.3%)	4 (4.0%)	14 (3.5%)
Major Ischemic	3 (3.0%)	6 (1.5%)	3 (3.0%)	7 (1.8%)
Minor Ischemic	1 (1.0%)	5 (1.3%)	1 (1.0%)	6 (1.5%)
Major Hemorrhagic	1 (1.0%)	3 (0.8%)	1 (1.0%)	3 (0.8%)
Minor Hemorrhagic	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Non-ipsilateral (to 30 days)	1 (1.0%)	4 (1.0%)	1 (1.0%)	4 (1.0%)
Non-ipsilateral (31 - 365 days)	N/A	N/A	0 (0.0%)	1 (0.3%)
Non-ipsilateral (All)	1 (1.0%)	4 (1.0%)	1 (1.0%)	5 (1.3%)
Major Ischemic	0 (0.0%)	3 (0.8%)	0 (0.0%)	4 (1.0%)
Minor Ischemic	1 (1.0%)	0 (0.0%)	1 (1.0%)	0 (0.0%)
Major Hemorrhagic	0 (0.0%)	1 (0.3%)	0 (0.0%)	1 (0.3%)
Minor Hemorrhagic	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)

[1]All data based on ITT (intent-to-treat) population, which includes all subjects enrolled in the study regardless of whether they received a stent

[2]Death: The Clinical Events Committee (CEC) adjudicated all deaths to determine if the death was defined as neurological (death due to a stroke, a complication of the procedure including bleeding, vascular repair or surgery or any death in which a neurological cause could not be excluded), or non-neurological (defined as death due to either a cardiac-related cause or due to another [other] cause).

Table 3. Other Adverse Events Summary[1]

	Events to 30 Days		Events to 365 Days	
	MAVERIC I N = 99 n (%)	MAVERIC II N = 399 n (%)	MAVERIC I N = 99 n (%)	MAVERIC II N = 399 n (%)
Target Lesion Revascularization (TLR)[2]	0 (0.0)	0 (0.0)	2 (2.0)	5 (1.3)
Surgery	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.3)
Percutaneous	0 (0.0)	0 (0.0)	2 (2.0)	4 (1.0)
Target Vessel Revascularization (not TLR)[3]	0 (0.0)	0 (0.0)	2 (2.0)	2 (0.5)
Surgery	0 (0.0)	0 (0.0)	1 (1.0)	0 (0.0)
Percutaneous	0 (0.0)	0 (0.0)	1 (1.0)	2 (0.5)
Blood and Lymphatic System Disorders[4]	0 (0.0)	14 (3.5)	0 (0.0)	31 (7.8)
Cardiac Disorders[5]	2 (2.0)	27 (6.8)	7 (7.1)	72 (18.0)
Congenital, Familial and Genetic Disorders[6]	0 (0.0)	1 (0.3)	0 (0.0)	2 (0.5)
Ear and Labyrinth Disorders[7]	0 (0.0)	1 (0.3)	0 (0.0)	1 (0.3)
Eye Disorders[8]	3 (3.0)	0 (0.0)	3 (3.0)	2 (0.5)
Gastrointestinal Disorders[9]	0 (0.0)	13 (3.3)	2 (2.0)	38 (9.5)
General Disorders and Administration Site Conditions[10]	0 (0.0)	15 (3.8)	2 (2.0)	55 (13.8)
Hepatobiliary Disorders[11]	0 (0.0)	0 (0.0)	0 (0.0)	2 (0.5)
Infections and Infestations[12]	0 (0.0)	18 (4.5)	3 (3.0)	33 (8.3)
Injury, Poisoning and Procedural Complications[13]	0 (0.0)	6 (1.5)	3 (3.0)	22 (5.5)
Investigations[14]	1 (1.0)	23 (5.8)	5 (5.1)	34 (8.5)
Metabolism and Nutrition Disorders[15]	0 (0.0)	1 (0.3)	1 (1.0)	11 (2.8)
Musculoskeletal and Connective Tissue Disorders[16]	0 (0.0)	2 (0.5)	1 (1.0)	5 (1.3)
Neoplasms Benign, Malignant and Unspecified (incl Cysts and Polyps)[17]	1 (1.0)	5 (1.3)	3 (3.0)	11 (2.8)
Nervous System Disorders[18]	5 (5.1)	30 (7.5)	9 (9.1)	50 (12.5)
Psychiatric Disorders[19]	0 (0.0)	6 (1.5)	0 (0.0)	9 (2.3)
Renal and Urinary Disorders[20]	0 (0.0)	8 (2.0)	3 (3.0)	24 (6.0)
Reproductive System and Breast Disorders[21]	0 (0.0)		0 (0.0)	1 (0.3)
Respiratory, Thoracic and Mediastinal Disorders[22]	1 (1.0)	8 (2.0)	3 (3.0)	28 (7.0)
Skin and Subcutaneous Tissue Disorders[23]	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.3)
Surgical and Medical Procedures[24]	2 (2.0)	9 (2.3)	16 (16.2)	47 (11.8)
Vascular Disorders[25]	5 (5.1)	28 (7.0)	10 (10.1)	70 (17.5)

[1]All data based on ITT population

[2]Target Lesion Revascularization: Any 'clinically driven' repeat percutaneous intervention (including angioplasty, stenting, endarterectomy, or thrombolysis) or carotid endarterectomy performed to open or increase the luminal diameter of the previously treated lesion.

[3]Target Vessel Revascularization: Any 'clinically driven' repeat percutaneous intervention (including angioplasty, stenting, endarterectomy or thrombolysis) or carotid endarterectomy of the previously treated vessel.

[4]Blood and Lymphatic System Disorders include: anemia, blood dyscrasia, coagulopathy, iron deficiency anemia, aggravated neutropenia, secondary anemia, thrombocytopenia

[5]Cardiac Disorders include: Angina pectoris (includes unstable), bradycardia (includes sinus), aortic valve stenosis, atrial fibrillation, AV block (includes complete), cardiac arrest, CAD, CHF, cardiac failure (includes congestive), cardiac tamponade, cardio-respiratory arrest, cardiomyopathy, cardiopulmonary failure, mitral valve incompetence, MI, myocardial ischemia, pulmonary edema (includes acute), coronary artery

insufficiency, sick sinus syndrome, tachycardia (includes supraventricular and ventricular), asystole (includes ventricular), ventricular fibrillation

[6]Congenital, Familial and Genetic Disorders include: Arterio-venous malformation, congenital atrial septal defect

[7]Ear and Labyrinth Disorders include: Labyrinthitis

[8]Eye Disorders include: Transient blindness, blindness (unilateral), blurred vision, reduced visual acuity, visual disturbances

[9]Gastrointestinal Disorders include: Abdominal hernia, abdominal pain, small intestinal perforation, colonic perforation, diverticulitis, diverticulum intestinal, duodenal ulcer (hemorrhage), esophageal obstruction, gastric ulcer (hemorrhage), gastritis, gastroduodenal ulcer, GI hemorrhage, hematemesis, lower GI hemorrhage, melena, mesenteric artery stenosis, discolored feces, nausea, pancreatitis, rectal hemorrhage, retroperitoneal hemorrhage, stomatitis, vomiting

[10]General Disorders and Administration Site Conditions include: Injection site hemorrhage, peripheral edema, adverse drug reaction, cardiac death, chest pain, death, fall, fatigue, migration of implant, multi-organ failure, peripheral edema, pyrexia, weakness

[11]Hepatobiliary Disorders include: cholecystitis, hepatic failure

[12]Infections and Infestations include: Bacteremia, cellulitis, colitis pseudomembranous, Infection, pneumonia, UTI, bacterial endocarditis, GU tract infections, groin infection, herpes zoster, klebsiella infection, pseudomonas infection, sepsis, upper respiratory tract infection, urosepsis, West Nile viral infection

[13]Injury, Poisoning and Procedural Complications include: Accidental overdose, coronary artery restenosis, fracture (includes femur, hip, humerus, lower limb, radius, upper limb), wound evisceration, hemothorax, intraoperative hypotension, postoperative anemia, postoperative hypotension, post-procedure diarrhea, post-procedure hemorrhage, road traffic accident, stent occlusion

[14]Investigations include: Decreased hematocrit, decreased hemoglobin, coronary ateriogram, increased cardiac enzymes, abnormal cardiac stress test, increased blood creatinine, decreased blood pressure, increased blood pressure, positive fecal occult blood, prolonged coagulation time, increased intraocular pressure, medical observation, abnormal thoracic cavity drainage test

[15]Metabolism and Nutrition Disorders include: anorexia, dehydration, diabetes mellitus (includes inadequately controlled), diabetic ketoacidosis, electrolyte imbalance. Hyperglycemia, hyperkalemia, hyponatremia

[16]Musculoskeletal and Connective Tissue Disorders include: Pain in limb, back pain (includes aggravated), groin pain, peripheral swelling

[17]Neoplasms Benign, Malignant and Unspecified (incl Cysts and Polyps) include: cancer (includes bladder, breast, colon, gastric, liver, renal cell, pharyngeal, thyroid, ureteric, metastasis), lymphoma, carcinoid tumor, pharyngeal neoplasm

[18]Nervous System Disorders include: cerebrovascular accident, carotid artery aneurysm, carotid artery stenosis, hemaniopia, loss of consciousness, parathesis, convulsions, dizziness, memory impairment, neurological symptoms, aphasia, cerebral hemorrhage, cerebral infarction, clonic convulsion, coma, dementia of the Alzheimers type, dysarthria, embolic stroke, hemorrhagic transformation stroke, hemiparesis, hemiplegia, intraventricular hemorrhage, hypoesthesia, intracranial hemorrhage, ischemic stroke, spinal stenosis (includes lumbar), monoplegia, somnolence, subarachnoid hemorrhage, subdural hematoma, syncope, TIA, vasovagal attack, visual field defect

[19]Psychiatric Disorders include: Agitation, anxiety (includes aggravated), confusion, disorientation, mental status change

[20]Renal and Urinary Disorders include: Renal calculus, renal colic, renal failure (acute, aggravated and chronic), renal impairment, renal nephropathy, renal artery stenosis, urinary retention

[21]Reproductive System and Breast Disorders include: Uterovaginal prolapse

[22]Respiratory, Thoracic and Mediastinal Disorders include: Dyspnea, pulmonary hemorrhage, respiratory failure (includes acute), asthma (includes aggravated), chronic obstructive airway disease (includes aggravated), dyspnea (includes exertional) pleural effusion, aspiration pneumonia, pneumothorax, pulmonary embolism, pulmonary hypertension, respiratory arrest

[23]Skin and Subcutaneous Tissue Disorders include: Chronic skin ulcer

[24]Surgical and Medical Procedures include: Aortic aneurysm repair, aortic valve repair, aortic valve replacement, arterial bypass operation, cardiac pacemaker replacement, carotid endarterectomy, cerebrovascular surgery, cervical operation, colon surgery, CABG, coronary artery surgery, coronary revascularization, detached retina repair, endarterectomy, hernia repair, arthroplasty (includes hip, knee), hip surgery, malignant neoplasm excision, malignant breast lump removal, mitral valve replacement, mastectomy (partial), PTCA, PTA, polypectomy, renal vascularization surgery, shoulder surgery, spinal laminectomy, hospitalization, tracheostomy, cardiac valvuloplasty, vascular bypass grafts, whole blood transfusion

[25]Vascular Disorders include: Aortic aneurysm, arterial restenosis, arterial rupture, arterial stenosis, diabetic peripheral angiopathy, femoral arterial stenosis, femoral artery occlusion, gangrene, hematoma, hemorrhage, hypertension (includes aggravated), hypotension (includes aggravated, orthostatic), iliac artery stenosis, intermittent claudication, peripheral artery dissection, peripheral ischemia, peripheral vascular disorder, peripheral revascularization, poor peripheral circulation, vascular pseudoaneurysm, venous thrombosis (deep limb).

Table 4. Cause of Death[1,2]

	MAVERIC I n (%)	**MAVERIC II n (%)**
0 - 30 days	**n = 99**	**n = 399**
Neurological	1 (1.0%)	2 (0.5%)
Cardiac	0	2 (0.5%)
Other	0	0
Total (0- 30 days)	**1 (1.0%)**	**4 (1.0%)**
31 - 365 days	**n = 99**	**n = 399**
Neurological	0	2 (0.5)
Cardiac	0	18 (4.5%)
Other: Infection Respiratory Cancer Renal Failure Stroke[3]	0	13 (3.3%%) 2 4 4 2 1
Total (31 - 365 days)	**0**	**33 (8.3)**
Total (0 - 365 days)	**1 (1.0%)**	**37 (9.3%)**

[1]All data based on ITT population

[2] No reported deaths due to device malfunction or failure.

[3] Death due to progression of arteriosclerosis; does not meet study definition for neurological death.

6.2 Potential Adverse Events

Based on the literature and on clinical and commercial experience with carotid stents and embolic protection systems, the following list includes possible adverse events associated with these devices:

- Abrupt closure
- Acute myocardial infarction
- Allergic reaction (contrast medium; drug; stent or filter material)
- Amaurosis fugax
- Aneurysm or pseudoaneurysm in vessel or at vascular access site
- Angina/ Coronary ischemia
- Arrhythmia (including premature beats, bradycardia, atrial and/or ventricular tachycardia, atrial and/or ventricular fibrillation [VF])
- Asystole or bradycardia requiring placement of a temporary pacemaker
- Arteriovenous fistula
- Bleeding complications from anticoagulant or antiplatelet medication requiring transfusion or surgical intervention
- Cerebral edema
- Cerebral hemorrhage
- Cerebral ischemia
- Congestive heart failure (CHF)
- Death
- Detachment and/or implantation of a component of the system
- Dissection of blood vessel
- Distal embolic protection device thrombosis/ occlusion
- Emboli, distal (air, tissue, plaque, thrombotic material, stent)
- Emergent or urgent surgery (Carotid Endarterectomy [CEA])
- Emergent surgery to remove stent or distal embolic protection device
- Fever
- Hematoma at vascular access site, with or without surgical repair
- Hemorrhagic event, with or without transfusion
- Hyperperfusion syndrome
- Hypotension/Hypertension
- Infection, local or systemic including bacteremia or septicemia
- Ischemia/ infarction of tissue/ organ
- Pain (head/ neck)/ severe unilateral headache
- Pain at catheter insertion site
- Renal failure/ insufficiency secondary to contrast medium
- Restenosis of vessel in stented segment
- Seizure
- Stent/ distal embolic protection device entanglement/ damage
- Stent/ distal embolic protection device collapse or fracture
- Stent malapposition/ migration
- Stent thrombosis/ occlusion
- Stroke / cerebrovascular accident (CVA) / transient ischemic attack (TIA)
- Total occlusion of the carotid artery
- Vascular thrombosis/ occlusion at puncture site, treatment site, or remote site
- Vessel dissection, perforation or rupture
- Vessel spasm or recoil

Any device-related adverse event occurring that involves the Exponent Self-Expanding Carotid Stent with RX Delivery System or any other product complaints should be reported immediately to Medtronic, Inc., Customer Service at (800) 465-5533.

7.0 CLINICAL STUDIES

The MAVErIC Trial: Evaluation of the Medtronic AVE Self-Expanding Carotid Stent System with Distal Protection in the Treatment of Carotid Stenosis was two prospective, non-randomized, multi-center, single arm clinical trials with the MAVErIC I study being a feasibility study and the MAVErIC II study being a pivotal study. These trials were performed to demonstrate the safety and efficacy of the Medtronic Exponent Self-Expanding Carotid Stent with Over-the-Wire (OTW) Delivery System and the GuardWire Temporary Occlusion & Aspiration System when used to treat high-risk surgical and non-surgical, symptomatic (> 50% stenosis) and asymptomatic (> 80% stenosis) subjects with disease in the common or internal carotid artery. MAVErIC I enrolled a total of 99 patients at 16 clinical sites in the U.S. and MAVErIC II enrolled 399 patients at 34 clinical sites in the U.S. for a combined total of 498 patients. An overview of the MAVErIC I & II Clinical Studies is presented in Table 5.

The primary endpoint is defined as any death, MI, or stroke at 30 days post-procedure plus the rate of ipsilateral stroke from 31 – 365 days.

Table 5. MAVERIC I & II Clinical Studies Overview

	MAVERIC I	MAVERIC II
Products Evaluated	Exponent Self-Expanding Carotid Stent with Over-the-Wire (OTW) Delivery System and the GuardWire Temporary Occlusion & Aspiration System	
Study Design	Non-randomized, multi-center, single-arm, prospective clinical trials.	
Sample Size	99 patients	399 patients
Number of Sites	16 in the U.S.	34 in the U.S.
Primary Endpoint	Any death, MI, stroke to 30 days and ipsilateral stroke from 31 - 365 days.	
Secondary Endpoints	***Safety:*** • Freedom from any stroke, MI or death at 30 days, freedom from target lesion revascularization at one year. ***Efficacy:*** • Acute success defined by: ◦ Lesion[1] ◦ device (stent delivery system and distal protection device)[2] ◦ procedure[3].	***Safety:*** • Major Adverse Events at 30 days post procedure defined as any stroke, MI, and / or death. ***Efficacy:*** • Acute success defined by: ◦ Lesion[1] ◦ device (stent delivery system and distal protection device)[2] ◦ procedure[3]. • Freedom from stroke at one year.
Study Hypothesis	Results meet the Performance Goal (PG) derived from historical carotid endarterectomy (CEA) data	
Patient Follow-Up[4]	• Neurologic evaluation by an independent neurologist at 30 days, 6 months, and 365 days. • Clinical assessment via telephone call at 14 days and physical assessment (office visit) at 30 days, 6 months, and 365 days, and annually for 3 years thereafter • Carotid duplex scans performed at 2 weeks and 365 days.	• Neurologic evaluation by an independent neurologist or NIHSS stroke-certified surrogate at 30 days, 6 months, and 365 days. • Physical assessment (office visit) at 30 days, 6 months, and 365 days, and annually for 3 years thereafter. • Carotid duplex scans performed at 4 weeks and 365 days.

[1]Lesion Success: Attainment of < 30% residual in-stent stenosis (by QCA) of the target lesion using any percutaneous method; if in-stent measurements not available, then in-lesion measurements were used; if in-lesion (by QCA) measurements not available, then visual estimates were used.

[2]Device (stent delivery system plus distal protection device) Success: Attainment of < 30% residual in-stent stenosis (by QCA) of the target lesion using the study devices; this measure is a union of Stent and Embolic Protection Device Success.

[3]Procedure Success: Attainment of residual in-stent stenosis (by QCA) of the target lesion and no in-hospital Major Adverse Events. If in-stent measurements not available, then in-lesion measurements (by QCA) were used; if in-lesion measurements not available, then visual estimates were used.

[4]Original protocol included a 5 year follow-up period; however, the follow-up was changed with a revision to the investigational plan reducing the follow-up to 3 years.

The study hypothesis was to demonstrate that the results of the Medtronic Vascular carotid stent clinical studies (MAVERIC I & II) met the 'Performance Goal' (PG) derived from historical carotid endarterectomy (CEA) data, demonstrating that the 1-year primary endpoint event rate was within the anticipated clinically reasonable range as noted in Section 7.1.

The protocol required regular patient follow-up by the treating physician and follow-up neurological assessment by either an independent neurologist or an NIH stroke scale-certified evaluator. Core laboratories provided independent assessments for angiographic, ultrasound and ECG. Medical monitors reviewed all safety data to ensure appropriate reporting of adverse events. A Clinical Events Committee adjudicated suspected primary endpoint events. A Data Safety Monitoring Board monitored adverse events to ensure patient safety.

7.1 Statistical Methods

The statistical analyses of the MAVErIC I and II studies were designed to demonstrate that the primary endpoint event rates were significantly less than a performance goal derived from available CEA literature, which represented the standard of care for carotid revascularization at the time of study initiation.

The one-year major event rate from CEA was estimated as ω_A x 11% + ω_C x 14%, where ω_C = the proportion of subjects with co-morbidity risk factors and ω_A = the proportion of subjects with anatomic risk factors. Based on this estimate, the study hypotheses were established as:

H_0: $\pi_{\text{Medtronic AVE}} \geq \omega_A$ x 11% + ω_C x 14% + 4%
H_A: $\pi_{\text{Medtronic AVE}} < \omega_A$ x 11% + ω_C x 14% + 4%,

where $\pi_{\text{Medtronic AVE}}$ = the one-year primary endpoint event rate and where ω_A and ω_C are based on the observed mix of subjects enrolled with each type of surgical risk factor. With a one-sided type I error of 5% and a type II error of 20%, the upper bound of the one-sided 95% confidence interval for the primary endpoint event rate must be less than the calculated performance goal for the null hypothesis to be rejected.

7.2 Eligibility Criteria Summary

The study population consisted of male and female patients at least 18 years of age, with discrete lesions in the common or internal carotid artery. Patients had to be high-risk candidates for surgery or non-surgical candidates; both symptomatic (≥ 50% stenosis) and asymptomatic (≥ 80% stenosis) patients were eligible. Symptomatic patients were defined as having:

- sudden numbness or weakness of face, arm or leg – especially on one side of the body
- sudden confusion, trouble speaking or understanding
- sudden trouble seeing in one or both eyes
- sudden trouble walking, dizziness, loss of balance or coordination
- sudden severe headache with no known causes

Patients were excluded from eligibility if they had an occurrence of non-disabling stroke, disabling stroke within 4 weeks of the index procedure or symptoms of a TIA or amaurosis fugax within 24 hours of the index procedure.

The inclusion criteria for MAVErIC I and MAVErIC II were similar. Key inclusion criteria included:

- Asymptomatic patient: meets angiographic and clinical inclusion criteria; carotid stenosis to be ≥ 80% by angiography, using NASCET methodology to determine degree of stenosis.
- Symptomatic patient: meets angiographic and clinical inclusion criteria; carotid stenosis to be ≥ 50% by angiography, using NASCET methodology to determine degree of stenosis **and** had one or more of the following criteria:
  a. Previous ipsilateral carotid endarterectomy; restenosis of previous CEA.
  b. Contralateral carotid artery occlusion of the ICA.
  c. Patient is status/ post radical neck dissection.
  d. Patient is status/ post radiation therapy to neck region.
  e. Surgically inaccessible lesions (e.g. target lesion above level of C2 or below the clavicle).
  f. Dissection of the common or internal carotid artery.
  g. Inability to extend neck (i.e. cervical osteoarthritis, mobility limitations).
  h. Tandem lesions ≥ 70% stenosis.
  i. Contralateral laryngeal nerve paralysis (palsy).
  j. Presence of tracheostomy stoma.
  k. Patient is at risk for wound infection due to medical status.
  l. Patients > 80 years of age.
  m. Myocardial infarction within previous 6 weeks and current need for carotid artery revascularization.
  n. COPD with FEV_1 < 30% (predicted).
  o. Unstable angina defined as rest pain with electrocardiogram (ECG) changes.
  p. History of liver failure with elevated prothrombin time.
  q. New York Heart Association (NYHA) Class III or IV heart failure or ejection fraction < 30%.
  r. Two or more major diseased coronary arteries with > 70% stenosis at the time of index procedure in patients with a history of angina that have not been revascularized.
- Target ICA vessel reference diameter had to be ≥ 5.5 mm and ≤ 9.5 mm by angiography.

Specific Inclusion Criteria for the Exponent Carotid Stent and the OTW Delivery System and the GuardWire® Temporary Occlusion & Aspiration System

- The vessel distal to the lesion had to have an absence of excessive tortuosity and an available segment that was straight or mildly angulated ≥ 4.0 cm by angiography in the distal ICA (prior to the petrous portion of the vessel) in which to place the embolic protection device.
- The diameter of the vessel in the distal ICA (straight or mildly angulated) prior to the petrous portion of the vessel had to be ≥ 4.5 mm and ≤ 5.5 mm by angiography.

Table 6 gives the numbers of patients included in the MAVErIC I and II studies based on risk factors.

Table 6. Patient Risk Factors for Inclusion

RISK FACTORS	MAVErIC I (N = 99 Patients) % (n/N)	MAVErIC II (N = 399 Patients) % (n/N)
ANATOMICAL		
Previous Carotid Endarterectomy	59.6% (59/99)	28.6% (114/399)
Contralateral Carotid Artery Occlusion	5.1% (5/99)	8.5% (34/399)
Previous Radical Neck Dissection Or Radiation Therapy To Neck Region	11.1% (11/99)	9.3% (37/399)
Target Lesion Above C-2 (Level Of Jaw)	7.1% (7/99)	10.3% (41/399)
Low Cervical Carotid Lesions	1.0% (1/99)	1.0% (4/399)
Dissection	1.0% (1/99)	0.0% (0/399)
Inability To Extend Neck (i.e. Cervical Osteoarthritis, Mobility Limitations)	8.1% (8/99)	7.3% (29/399)
Tandem Lesions ≥ 70% Stenosis	2.0% (2/99)	1.3% (5/399)
Contralateral Laryngeal Palsy	1.0% (1/99)	1.3% (5/399)
At Risk For Wound Infection	5.1% (5/99)	3.3% (13/399)
Tracheostomy	1.0% (1/99)	1.5% (6/399)
CO-MORBIDITY		
Patients > 80 Years Of Age	10.1% (10/99)	35.3% (141/399)
Two Or More Major Diseased Coronary Arteries With >70% Stenosis At The Time Of Index Procedure In Patients With A History Of Angina	NA	15.3% (61/399)
Myocardial Infarction Within Previous 6 Weeks	0.0% (0/99)	0.8% (3/399)
NYHA Class III Or IV Heart Failure	15.2% (15/99)	12.8% (51/399)
Unstable Angina (Defined As Resting Pain With ECG Changes)	3.0% (3/99)	3.3% (13/399)
History Of Liver Failure With Elevated Prothrombin Time	0.0% (0/99)	0.3% (1/399)
Requires Concurrent CABG, AAA Repair Or Peripheral Vascular Surgery	0.0% (0/99)	0.0% (0/399)
COPD With FEV1 < 30% Predicted	3.0% (3/99)	1.8% (7/399)

7.3 Description of Patients Evaluated

Table 7 summarizes patient follow-up at the endpoint evaluation time points.

Table 7. Patient Follow-up

	MAVERIC I (N = 99 patients) % (n/N)	MAVERIC II N = 399 patients) % (n/N)
30 Days		
Patients Enrolled	100.0% (99/99)	100.0% (399/399)
Cumulative Death	1.0% (1/99)	1.0% (4/399)
Cumulative Withdrawn or LTF	0.0% (0/99)	1.5% (6/399)
Patients Evaluable	99.0% (98/99)	97.5% (389/399)
Patients Evaluated[1]	97.0% (96/99)	94.5% (377/399)
Neurological Evaluation[2]	88.9% (88/99)	89.0% (355/399)
Ultrasound Evaluation[3]	90.9% (90/99)	86.4% (345/399)
Other Clinical Evaluation Only[4]	8.1% (8/99)	5.5% (22/399)
365 Days		
Cumulative Death	1.0% (1/99)	9.3% (37/399)
Cumulative Withdrawn or LTF	1.0% (1/99)	7.5% (30/399)
Patients Evaluable	98.0% (97/99)	83.2% (332/399
Patients Evaluated	96% (95/99)	79.7% (318/399)
Neurological Evaluation	78.8% (78/99)	72.7% (290/399
Ultrasound Evaluation	79.8% (79/99)	73.2% (292/399)
Other Clinical Evaluation Only	17.2% (17/99)	7.0% (28/399)

[1]Patients evaluated defined as a complete 30 or 365 day contact form
[2]Neurological assessment defined as a complete NIH Stroke Scale Form
[3]Ultrasound evaluation took place at 14 days for MAVERIC I
[4]Other Clinical Evaluation Only defined as a complete 30 or 365 day contact form with no neurological evaluation

7.4 Description of Patient Demographics

Table 8 summarizes patient demographic information for the 99 patients enrolled into the MAVERIC I trial and the 399 patients enrolled into the MAVERIC II trial.

Table 8. Patient Demographic Information, MAVERIC I & II

Patient Characteristic	MAVERIC I	MAVERIC II
Age (yrs)		
Mean ± SD (N)	69.26 ± 10.20 (99)	74.08 ± 9.39 (399)
Range (Min, Max)	43.00, 89.00	41.00, 95.00
Gender, % (n/N)[1]		
Male	57.6% (57/99)	58.6% (234/399)
Female	42.4% 42/99	41.4% (165/399)
Race, % (n/N)[1]		
White	89.9% (89/99)	91.2% (364/399)
Black	5.1% (5/99)	3.8% (15/399)
Hispanic	3.0% (3/99)	3.0% (12/399)
Asian	1.0% (1/99)	0.8% (3/399)
Other	1.0% (1/99)	1.3% (5/399)
Medical History, % (n/N)[1]		

Patient Characteristic	MAVERIC I	MAVERIC II
Left Ventricular Function		
Normal (ejection fraction > 55%)	45.0% (27/60)	51.6% (126/244)
Mildly Impaired (ejection fraction 46% to 55%)	25.0% (15/60)	12.3% (30/244)
Moderately Impaired (ejection fraction 30% to 45%)	15.0% (9/60)	22.1% (54/244)
Severely Impaired (ejection fraction < 30%)	15.0% (9/60)	13.9% (34/244)
Clinical Congestive Heart Failure	26.5% (26/98)	24.8% (96/387)
Peripheral Vascular Disease	52.6% (51/97)	44.0% (171/389)
Gastrointestinal/ Genitourinary Bleeding	8.2% (8/97)	5.3% (21/397)
Diabetes Mellitus	27.3% (27/99)	34.1% (136/399)
History of Liver Failure	0.0% (0/97)	0.3% (1/386)
Dyslipidemia Requiring Medication	68.7% (68/99)	70.8% (281/397)
History of Hypertension	91.8% (90/98)	87.9% (350/398)
Uncontrolled Systemic Hypertension	2.2% (2/91)	1.5% (6/393)
Cigarette Smoking (Ever)	72.7% (72/99)	67.3% (266/395)
Family History of Premature Atherosclerosis	41.9% (26/62)	NC
Significant Aortic Arch Atherosclerosis	1.1% (1/93)	NC
History of Cardiac Arrhythmia	17.7% (17/96)	NC
Severe Aortic/ Mitral Valvular Disease	7.4% (7/95)	NC
Renal Insufficiency	11.1% (11/99)	NC
Clinical COPD	3.4% (3/88)	NC
Coronary Artery Disease	66.3% (63/95)	NC
Unstable Angina	3.1% (3/98)	NC
Current Smoking	19.4% (19/98)	NC
Previous Q wave or Non-Q wave MI	28.0% (26/93)	27.8% (107/385)
Prior Cardiovascular Procedures, % (n/N)[1]		
Previous PTCA (coronary)	23.5% (23/98)	NC
Previous AVR	3.0% (3/99)	NC
Previous MVR	1.0% (1/99)	NC
Previous CABG	33.3% (33/99)	NC
Neurological History, % (n/N)[1]		
Previous PTA (Carotid)	0.0% (0/97)	2.3% (9/399)
Previous CEA	60.6% (60/99)	33.6% (134/399)
History of TIA	23.5% (23/98)	29.3% (115/392)
History of Stroke	21.9% (21/96)	22.5% (89/396)
Target Lesion Location, % (n/N)[1]		
Right Carotid		
Common	6.2% (6/97)	3.1% (12/389)
Internal	44.3% (43/97)	48.3% (188/389)
Left Carotid		
Common	11.% (11/97)	4.9% (19/389)
Internal	38.1% (37/97)	43.7% (170/389)
Baseline Target Lesion Characteristics, % (n/N)[1]		
Lesion location, %		
Contiguous	43.3% (42/97)	50.1% (194/387)
Remote	48.5% (47/97)	37.7% (146/387)
Sequential	8.2% (8/97)	12.1% (47/387)
Distance from Ostium (mm)		
Mean ± SD (N)	6.01 ± 7.87 (97)	3.63 ± 5.73 (387)

Patient Characteristic	MAVERIC I	MAVERIC II
Minimum, maximum	0.00, 42.40	0.00, 34.40
Lesion Length (mm)		
Mean ± SD (N)	14.71 ± 6.99 (96)	15.17 ± 6.83 (387)
Minimum, maximum	2.29, 33.71	4.56, 39.73
Discrete (< 10 mm), % (n/N)	26.0% (25/96)	25.1% (97/387)
Tubular (10 to 20 mm), % (n/N)	53.1% (51/96)	54.0% (209/387)
Diffuse (≥ 20 mm), % (n/N)	20.8% (20/96)	20.9% (81/387)
Lesion Eccentricity, % (n/N)	35.1% (34/97)	29.2% (113/387)
Thrombus, % (n/N)		
None	93.8% (91/97)	94.3% (365/387)
Possible	6.2% (6/97)	5.7% (22/387)
Mild	0.0% (0/97)	0.0% (0/387)
Moderate	0.0% (0/97)	0.0% (0/387)
Large	0.0% (0/97)	0.0% (0/387)
Total occlusion	0.0% (0/97)	0.0% (0/387)
Access tortuosity (any), % (n/N)	2.1% (2/97)	3.9% (15/387)
Distal tortuosity (any), % (n/N)	33.0% (32/97)	34.9% (135/387)
Calcification (unilateral or bilateral), % (n/N)	49.5% (48/97)	53.7% (208/387)
Ulceration, % (n/N)	23.7% (23/97)	27.4% (106/387)
Aneurysm, % (n/N)	6.2% (6/97)	3.1% (12/387)
Baseline TIMI flow, % (n/N)		
0, 1	0.0% (0/59)	0.0% (0/221)
2	3.4% (2/59)	5.9% (13/221)
3	96.6% (57/59)	94.1% (208/221)

NC = Value not captured

Source: CS002-01, Revision A, Section 14.1., Tables 14.1.3, 14.1.4.
CS007-01, Revision B, Section 14.1., Tables 14.1.3., 14.1.4

[1]Denominators indicate the total number of patients with available data for the related parameter.

Table 9 summarizes quantitative angiographic findings for the MAVErIC I trial.

Table 9. Quantitative Angiographic Findings, MAVErIC I

Parameter / Statistic	Time point	
	Pre-procedure	Final Assessment
Reference diameter		
Common carotid (mm)		
Mean ± SD (N[1])	6.64 ± 1.33 (97)	6.65 ± 1.33 (96)
Minimum, maximum	3.60, 10.00	3.66, 10.00
Internal carotid (mm)		
Mean ± SD (N[1])	4.56 ± 0.88 (97)	4.70 ± 0.93 (96)
Minimum, maximum	2.78, 6.51	3.02, 7.75
RVD (mm)		
Mean ± SD (N[1])	4.99 ± 1.32 (97)	5.12 ± 1.31 (96)
Minimum, maximum	2.78, 9.17	3.02, 8.89
MLD (mm)		
Mean ± SD (N[1])	1.48 ± 0.76 (97)	3.81 ± 0.75 (96)
Minimum, maximum	0.21, 3.30	1.57, 5.59
% Diameter stenosis		
Mean ± SD (N[1])	70.59 ± 12.30 (97)	23.41 ± 13.51 (96)
Minimum, maximum	38.93, 94.05	2.58, 63.99

Source: CS002-01, Revision A, Section 14.2, Table 14.2.4.

[1]Denominators indicate the total number of patients with available data for the related parameter.

Table 10 summarizes quantitative angiographic findings for the 399 patients enrolled into the MAVErIC II trial.

Table 10. Quantitative Angiographic Findings, MAVErIC II

Parameter / Statistic	Time point	
	Pre-procedure	Final Assessment
Reference diameter		
Common carotid (mm)		
Mean ± SD (n)[1]	6.51 ± 1.19 (387)	6.48 ± 1.19 (385)
Minimum, maximum	4.11, 10.45	4.03, 10.73
Internal carotid (mm)		
Mean ± SD (n)[1]	4.25 ± 0.79 (387)	4.32 ± 0.74 (385)
Minimum, maximum	2.22, 6.83	2.66, 6.82
RVD (mm)		
Mean ± SD (n)[1]	4.40 ± 0.93 (387)	4.46 ± 0.89 (385)
Minimum, maximum	2.38, 9.55	2.66, 9.25
MLD (mm)		
Mean ± SD (n)[1]	1.34 ± 0.54 (387)	3.64 ± 0.72 (385)
Minimum, maximum	0.34, 3.62	1.79, 5.84
% Diameter stenosis		
Mean ± SD (n)[1]	69.60 ± 9.88 (387)	17.45 ± 12.42 (385)
Minimum, maximum	36.07, 90.96	-25.54, 60.98

Source: CS007-01, Revision B, Section 14.2, Table 14.2.4.

[1]Denominators indicate the total number of patients with available data for the related parameter.

7.5 Clinical Results Summary

As demonstrated in Table 2, Section 6.1, the primary endpoint events (defined as any death, MI, or stroke reported from 0 to 30 days and any ipsilateral stroke reported from 31 – 365 days) occurred in 6 patients in the MAVERIC I clinical trial for a rate of 6.1% at both 30 days and 365 days. In the MAVERIC II trial, primary endpoint events occurred in 21 patients at 30 days for a rate of 5.3%, and occurred in 22 patients at 365 days for a rate of 5.5%. Table 3 details all other adverse events reported in the MAVERIC I and MAVERIC II studies at 30 days and at 365 days. Table 4 details the all-cause death rate of patients enrolled into the study that died between 0 days and 365 days. No deaths were attributed to device malfunction or failure. Table 11 below details the safety and efficacy measures for the ITT population.

Tables 12 and 13 display results of primary endpoint event hypothesis testing (imputation approach) for the MAVERIC I and II studies analysis populations (AP). The 95% one-sided upper confidence interval of the MAVERIC primary endpoint event rate is less than the hypothesized value (ω_A*11% + ω_C*14% + 4%), indicating the MAVERIC primary endpoint event rate is significantly less than the hypothesized value at the one-sided 0.05 level of significance.

Table 11. Safety and Efficacy Measures[1]

Safety and Efficacy Measures	MAVERIC I (N = 99) % (n/N)	MAVERIC II (N = 399) % (n/N)
Primary Endpoint		
Death, MI, Stroke to 30 days and Ipsilateral Stroke from 31-365 Days	6.1% (6/99)	5.5% (22/399)
30 Day Death	1.0% (1/99)	1.0% (4/399)
30 Day MI	1.0% (1/99)	1.5% (6/399)
30 Day Stroke	5.1% (5/99)	4.0% (16/399)
31-365 Day Ipsilateral Stroke	0.0% (0/99)	0.3% (1/399)
Secondary Endpoint		
Any MAE to 30 days (Death, MI, Stroke)	6.1% (6/99)	5.3% (21/399)
TLR	2.0% (2/99)	1.3% (5/399)
TVR	2.0% (2/99)	0.5% (2/399)
Primary Patency at 1 year	85.9% (85/99)	92.1% (363/394)
Technical Success	80.8% (80/99)	87.0% (347/399)
Acute Procedure Success	81.8% (81/99)	88.6% (350/395)

[1] All data based on ITT population

The Kaplan-Meier estimates for freedom-from-primary endpoint events to 365 days for the MAVERIC I & II trials for all ITT patients, all symptomatic patients and all asymptomatic patients are found in Tables 12, 13, 14, 15, 16, 17, 18 & 19.

Table 12. MAVERIC I Statistical Analysis for Primary Endpoint Events

	MAVERIC I (N = 99 Patients)	Weighted PG	Weighted PG + 0.04	Upper Bound of 1-Sided 95% CI
Primary Endpoint Events to 365 days[1] (n = 98)	6.1% (6/98)	11.765%	15.765%	11.73%

[1] Data based on analysis population (AP), defined as ITT population minus patients lost to follow-up.

A primary endpoint event is defined as Death, MI, Stroke to 30 days and Ipsilateral Stroke from 31-365 Days.
The PG (Performance Goal) for the AP population was based on 25 patients with high risk comorbid factors and 73 patients with high risk anatomic factors. The PG 1 year complication rate for high risk anatomic patients is 11% and the PG 1 year complication rate for high risk comorbid patients is 14%.

Table 13. MAVERIC II Statistical Analysis for Primary Endpoint Events

	MAVERIC II (N = 399 Patients)	Weighted PG	Weighted PG + 0.04	Upper Bound of 1-Sided 95% CI
Primary Endpoint Events to 365 days[1] (n = 375)	5.9% (22/375)	12.728%	16.728%	8.27%

[1] Data based on AP

A primary endpoint event is defined as Death, MI, Stroke to 30 days and Ipsilateral Stroke from 31-365 Days.
The PG (Performance Goal) for the AP population was based on 216 patients with high risk comorbid factors and 159 patients with high risk anatomic factors (2 patients with missing high risk data were considered high risk anatomic). The PG 1 year complication rate for high risk anatomic patients is 11% and the PG 1 year complication rate for high risk comorbid patients is 14%.

Table 14. MAVErIC I
Kaplan-Meier Estimate for Freedom-from-Primary Endpoint Events to 365 Days[1]

	Time Intervals (days)										
	0*	1-30	31-60	61-120	121-150	151-180	181-240	241-270	271-300	301-330	331-365
MAVErIC I											
# Entered	99	96	93	93	93	93	93	92	92	92	92
# Censored	0	0	0	0	0	0	1	0	0	0	2
# Incomplete	0	0	0	0	0	0	0	0	0	0	0
# Events	3	3	0	0	0	0	0	0	0	0	0
Cumulative % Event-Free	97.0%	93.9%	93.9%	93.9%	93.9%	93.9%	93.9%	93.9%	93.9%	93.9%	93.9%
SE	1.7%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%

[1] All data based on ITT population

* 0=Peri-procedure
# Entered – The number of patients entering the interval
# Censored – The number of patients who prematurely withdrew without an event in the interval
# Incomplete – The number of patients who died in the interval without event
# Events – The number of patients with event in the interval
Cumulative % Event-Free– Kaplan-Meier Estimate of % of patients without an event at the end of the interval from Peri-procedure
SE - Kaplan-Meier Estimate of % standard error

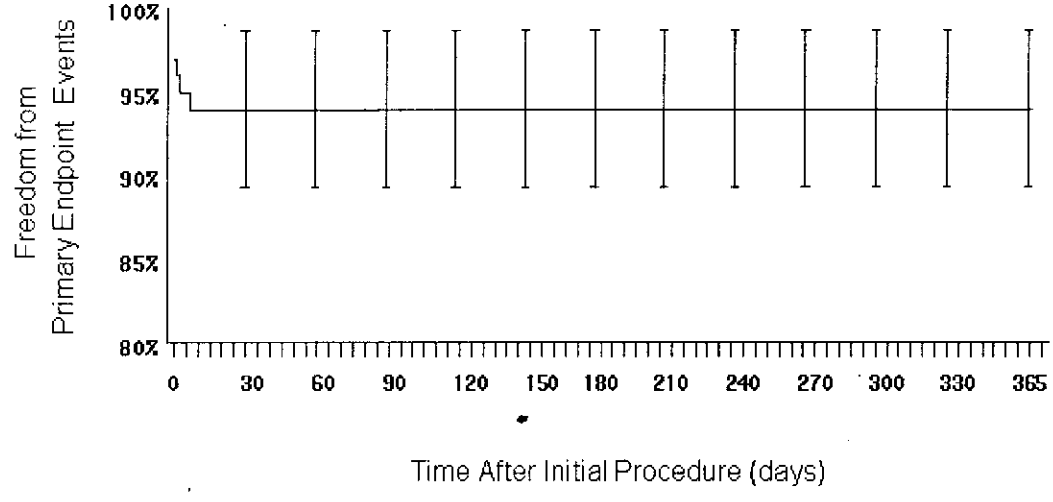


Table 15. MAVErIC I
Kaplan-Meier Estimate for Freedom-from-Primary Endpoint Events to 365 Days
Population: All Symptomatic Patients

	Time Intervals (days)										
	0*	1-30	31-60	61-120	121-150	151-180	181-240	241-270	271-300	301-330	331-365
MAVErIC I											
# Entered	38	35	33	33	33	33	33	33	33	33	33
# Censored	0	0	0	0	0	0	0	0	0	0	1
# Incomplete	0	0	0	0	0	0	0	0	0	0	0
# Events	3	2	0	0	0	0	0	0	0	0	0
Cumulative % Event-free	92.1%	86.8%	86.8%	86.8%	86.8%	86.8%	86.8%	86.8%	86.8%	86.8%	86.8%
SE	4.4%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%

* 0=Peri-procedure
# Entered – The number of patients entering the interval
# Censored – The number of patients who prematurely withdrew without an event in the interval
# Incomplete – The number of patients who died in the interval without event
# Events – The number of patients with event in the interval
Cumulative % Event-free– Kaplan-Meier Estimate of % of patients without an event at the end of the interval from Peri-procedure
SE - Kaplan-Meier Estimate of % standard error

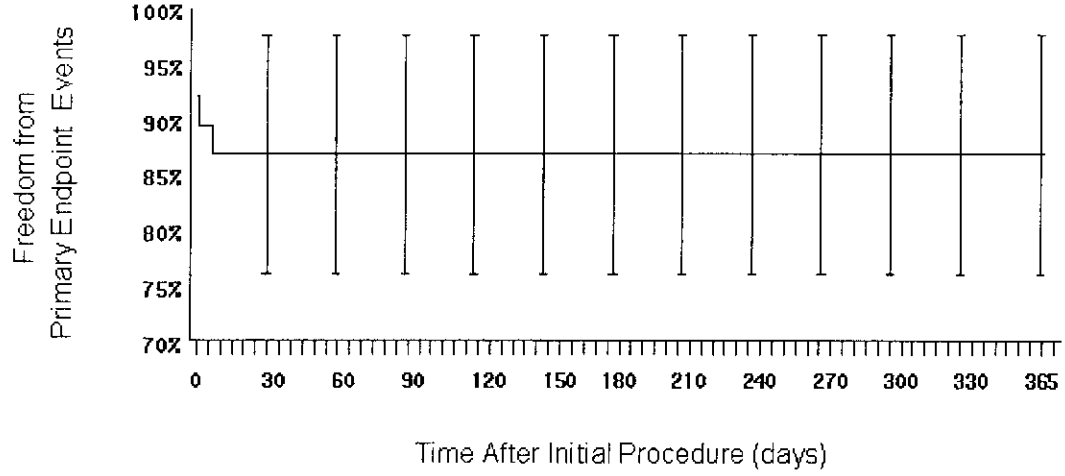


Table 16. MAVErIC I
Kaplan-Meier Estimate for Freedom-from-Primary Endpoint Events to 365 Days
Population: All Asymptomatic Patients

	Time Intervals (days)										
	0*	1-30	31-60	61-120	121-150	151-180	181-240	241-270	271-300	301-330	331-365
MAVErIC I											
# Entered	59	59	58	58	58	58	58	57	57	57	57
# Censored	0	0	0	0	0	0	1	0	0	0	1
# Incomplete	0	0	0	0	0	0	0	0	0	0	0
# Events	0	1	0	0	0	0	0	0	0	0	0
Cumulative % Event-free	100%	98.3%	98.3%	98.3%	98.3%	98.3%	98.3%	98.3%	98.3%	98.3%	98.3%
SE	0.0%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%

* 0=Peri-procedure
# Entered – The number of patients entering the interval
# Censored – The number of patients who prematurely withdrew without an event in the interval
# Incomplete – The number of patients who died in the interval without event
# Events – The number of patients with event in the interval
Cumulative % Event-free– Kaplan-Meier Estimate of % of patients without an event at the end of the interval from Peri-procedure
SE - Kaplan-Meier Estimate of % standard error

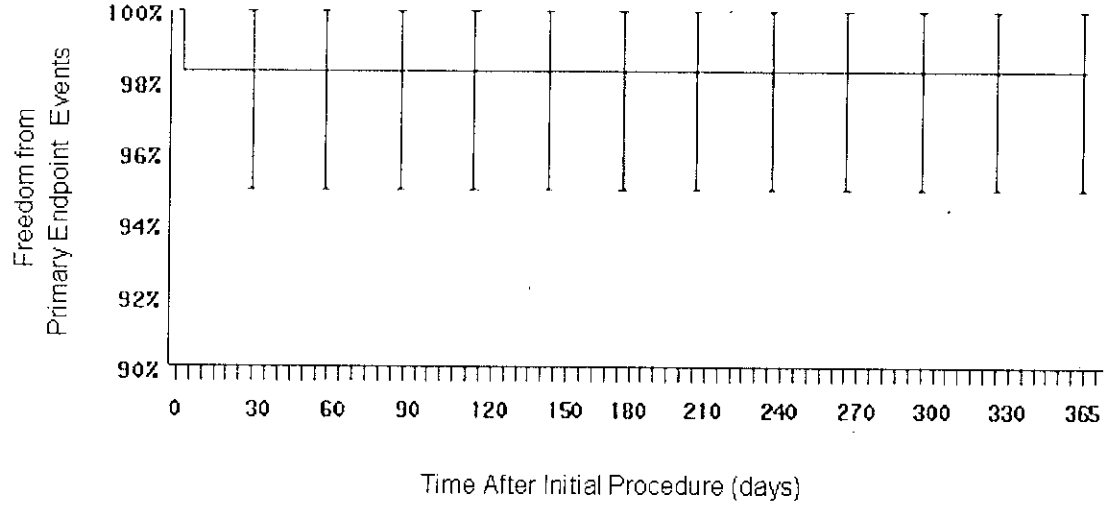


Table 17. MAVERIC II
Kaplan-Meier Estimate for Freedom-from-Primary Endpoint Events to 365 Days[1]

	Time Intervals (days)										
	0*	1-30	31-60	61-120	121-150	151-180	181-240	241-270	271-300	301-330	331-365
MAVERIC II											
# Entered	399	390	369	367	361	359	353	341	336	333	326
# Censored	0	9	2	2	0	3	4	3	0	1	9
# Incomplete	0	0	0	4	2	3	7	2	3	6	2
# Events	9	12	0	0	0	0	1	0	0	0	0
Cumulative % Event-free	97.7%	94.7%	94.7%	94.7%	94.7%	94.7%	94.4%	94.4%	94.4%	94.4%	94.4%
SE	0.7%	1.1%	1.1%	1.1%	1.1%	1.1%	1.2%	1.2%	1.2%	1.2%	1.2%

[1] All data based on ITT population

* 0=Peri-procedure
# Entered – The number of patients entering the interval
# Censored – The number of patients who prematurely withdrew without an event in the interval
# Incomplete – The number of patients who died in the interval without event
# Events – The number of patients with event in the interval
Cumulative % Event-free– Kaplan-Meier Estimate of % of patients without an event at the end of the interval from Peri-procedure
SE - Kaplan-Meier Estimate of % standard error

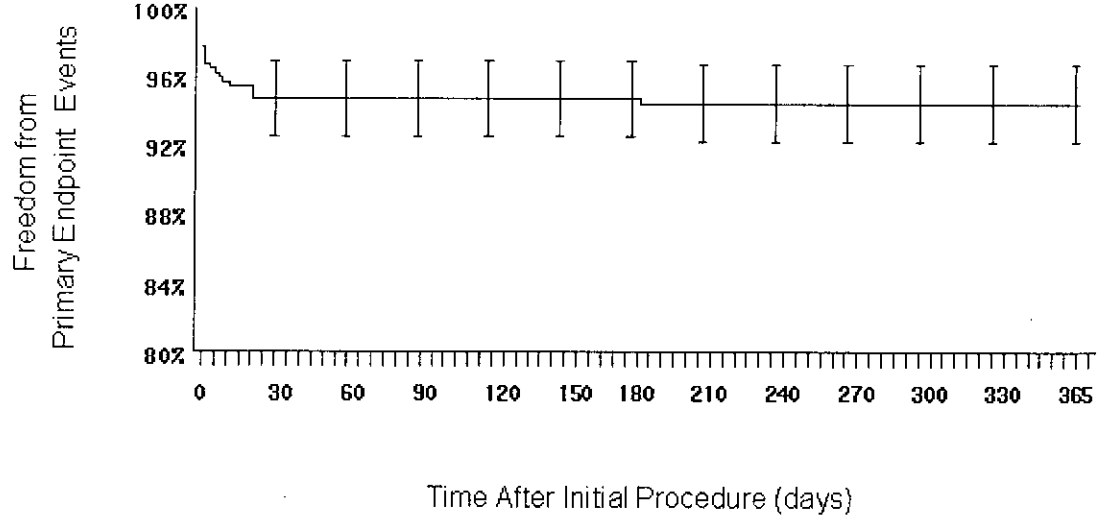


Table 18. MAVErIC II
Kaplan-Meier Estimate for Freedom-from-Primary Endpoint Events to 365 Days
Population: All Symptomatic Patients

	Time Intervals (days)										
	0*	1-30	31-60	61-120	121-150	151-180	181-240	241-270	271-300	301-330	331-365
MAVErIC II											
# Entered	175	171	158	157	153	153	150	145	142	142	139
# Censored	0	5	1	1	0	1	3	2	0	0	5
# Incomplete	0	0	0	3	0	2	2	1	0	3	0
# Events	4	8	0	0	0	0	0	0	0	0	0
Cumulative % Event-free	97.7%	93.1%	93.1%	93.1%	93.1%	93.1%	93.1%	93.1%	93.1%	93.1%	93.1%
SE	1.1%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%

* 0=Peri-procedure
# Entered – The number of patients entering the interval
# Censored – The number of patients who prematurely withdrew without an event in the interval
# Incomplete – The number of patients who died in the interval without event
# Events – The number of patients with event in the interval
Cumulative % Event-free– Kaplan-Meier Estimate of % of patients without an event at the end of the interval from Peri-procedure
SE - Kaplan-Meier Estimate of % standard error

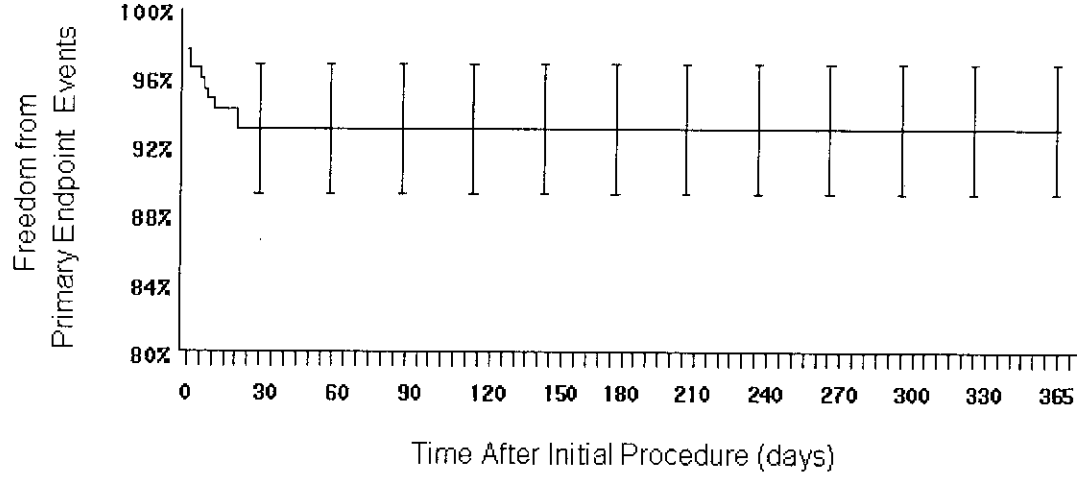
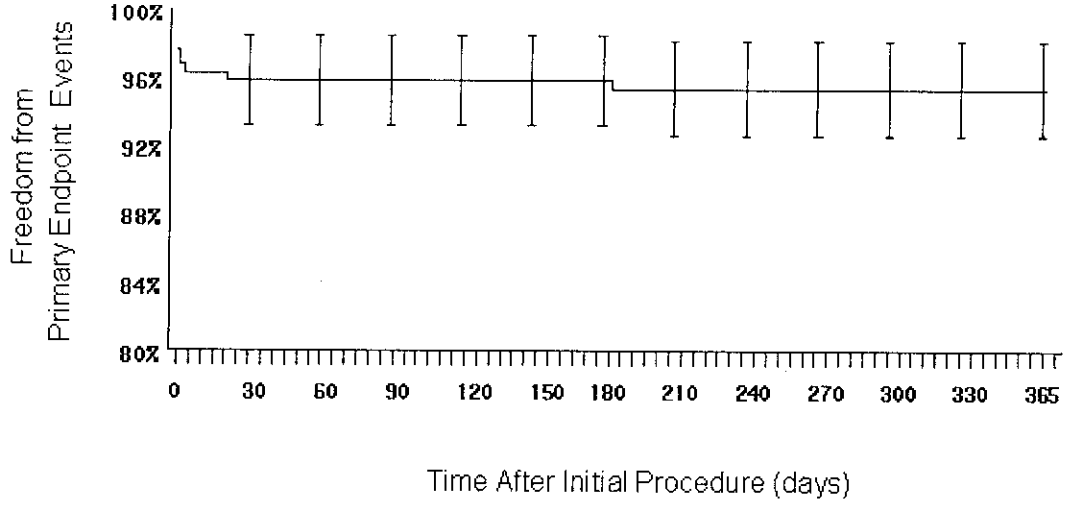


Table 19. MAVERIC II
Kaplan-Meier Estimate for Freedom-from-Primary Endpoint Events to 365 Days
Population: All Asymptomatic Patients

	Time Intervals (days)										
	0*	1-30	31-60	61-120	121-150	151-180	181-240	241-270	271-300	301-330	331-365
MAVERIC II											
# Entered	219	214	207	206	204	202	199	192	190	187	183
# Censored	0	3	1	1	0	2	1	1	0	1	4
# Incomplete	0	0	0	1	2	1	5	1	3	3	2
# Events	5	4	0	0	0	0	1	0	0	0	0
Cumulative % Event-free	97.7%	95.9%	95.9%	95.9%	95.9%	95.9%	95.4%	95.4%	95.4%	95.4%	95.4%
SE	1.0%	1.3%	1.3%	1.3%	1.3%	1.3%	1.4%	1.4%	1.4%	1.4%	1.4%

* 0=Peri-procedure
# Entered – The number of patients entering the interval
# Censored – The number of patients who prematurely withdrew without an event in the interval
# Incomplete – The number of patients who died in the interval without event
# Events – The number of patients with event in the interval
Cumulative % Event-free– Kaplan-Meier Estimate of % of patients without an event at the end of the interval from Peri-procedure
SE - Kaplan-Meier Estimate of % standard error



Results

Data from the MAVErIC Phase I (feasibility) and Phase II (pivotal) studies, in which the Exponent Carotid Stent System was investigated, include the 30-day primary endpoint event rate on 498 patients (Phase I: 99 patients, 6.1% primary endpoint event rate; Phase II: 399 patients, 5.3% primary endpoint event rate; see **Table 2**) and the 365-day primary endpoint event rate on a total of 473 patients (Phase I: 98 patients, 6.1%; Phase II: 375 patients, 5.9%) in the analysis population (see **Table 2**). In the ITT population of MAVErIC I, the probability of stroke at 365 days post procedure was 5.1% based on Kaplan-Meier estimates. In the ITT population of MAVErIC II, the probability of stroke at 365 days post procedure was 4.6% based on Kaplan-Meier estimates. One patient in the feasibility study and 2 patients in the pivotal study suffered a stroke and subsequently died during the combined in- and out-of-hospital 30-day follow-up period. There were no cardiac-related deaths in the MAVErIC Phase I study and 2 cardiac-related deaths in the MAVErIC Phase II study during the combined in- and out-of-hospital 30-day follow-up period.

In the MAVErIC I trial, 6 out of the 99 enrolled subjects followed to one year were observed to have at least one primary endpoint event. This leads to an overall primary endpoint event rate of 6.1%. In the MAVErIC II trial, 22 out of the 399 enrolled subjects followed to one year were observed to have at least one primary endpoint event. This leads to an overall primary endpoint event rate of 5.5%. In all cases, the 95% one-sided upper confidence interval of the MAVErIC primary endpoint event rate is less than the hypothesized value of 17%, indicating the MAVErIC primary endpoint event rate is significantly less than the hypothesized value, at the one-sided 0.05 level of significance.

8.0 CLINICAL USE INFORMATION

Only physicians who have received appropriate training and are familiar with the principles, clinical applications, complications, side effects and hazards commonly associated with carotid stent placement should use this device.

WARNING: *Do not use after the "Use By" date specified on the package. Assure that the device has been properly stored in a cool, dark, dry place prior to use.*

WARNING: *The Exponent Self-Expanding Carotid Stent with RX Delivery System is supplied sterile and is intended for single-use only. Do not use if the package is open or damaged or if the temperature indicator on the inside pouch is black. Do not reuse. Do not resterilize as this can compromise device performance and increase the risk of cross-contamination due to inappropriate reprocessing.*

8.1 Stent Size Determination

Careful stent sizing is important to successful stenting. The available stent diameters are 6.0 mm, 7.0 mm, 8.0 mm, 9.0 mm, and 10.0 mm each in stent lengths of 20 mm, 30 mm, and 40 mm. A minimum "interference" fit of 0.5 mm between the vessel and the stent is recommended in order to achieve optimum sizing and stent expansion of the self-expanding stent. For example, select a 6.0 mm stent to treat a 4.5 - 5.5 mm diameter vessel. Select a 7.0 mm stent to treat a 5.5 - 6.5 mm diameter vessel. The mean percentage of foreshortening for all stent sizes is less than 6%. The shortest stent length consistent with total lesion coverage is optimal. Should adequate coverage by one stent be impossible, a second Exponent stent may be used.

The delivery system has a 135 cm working length and is compatible with 0.014" embolic protection devices and guidewires. Introducer sheaths and guiding catheters with a minimum inner diameter of 0.087" are recommended for use with the Exponent Self-Expanding Carotid Stent with RX Delivery System.

WARNING: *The Exponent Carotid Stent System is contraindicated for use with lesions in the ostium of the common carotid artery.*

WARNING: *Appropriate sizing of the stent to the vessel is required to reduce the possibility of stent migration.*

Table 20. Exponent Carotid Stent Diameters

Unconstrained Stent Diameter (mm)	Stent Length (mm)	Reference Vessel Diameter (mm)
6.0 mm	20, 30, 40	4.5 - 5.5
7.0 mm	20, 30, 40	5.5 - 6.5
8.0 mm	20, 30, 40	6.5 - 7.5
9.0 mm	20, 30, 40	7.5 - 8.5
10.0 mm	20, 30, 40	8.5 - 9.5

8.2 Materials Required

- Appropriately vascular sheath compatible with the vascular anatomy having an I.D. of 0.087" (2.21 mm). Guiding catheter or sheath length should not interfere with stent delivery system requirements.
- Rotating Hemostasis Valve (RHV) ≥ 0.096" (2.44 mm) is optional. The Exponent Self-Expanding Carotid Stent with the RX Delivery System is not recommended for use with bleedback control hemostatic valves.
- Optional balloon dilatation catheter.
- Medtronic carotid distal embolic protection system with 0.014" guidewire.
- Two to three syringes (10 - 20 cc).
- 500 cc heparinized normal saline solution (sterile).

CAUTION: *The Exponent Self- Expanding Carotid Stent with the RX Delivery System is not compatible with guidewires or embolic protection devices larger than 0.014" (0.037 mm).*

8.3 Periprocedural Care

During the MAVErIC clinical studies, aspirin (ASA) 325 mg orally was given along with either ticlopidine 1000 mg ***or*** clopidogrel 300 mg to patients within 24 hours of the procedure when possible. After the procedure, ASA 325 mg was given indefinitely along with either clopidogrel 75 mg q.d. or ticlopidine 250 mg b.i.d. for a minimum of four weeks post procedure. Ticlopidine or clopidogrel was continued at the discretion of the physician.

Whenever possible, clopidogrel or ticlopidine was started the day before the procedure. Patients on a pre-existing regimen of clopidogrel or ticlopidine were medicated at the physician's discretion. If clopidogrel or ticlopidine were given within 12 hours before the start of the procedure, treatment with a GP IIbIIIa inhibitor is recommended.

WARNING: *Appropriate antiplatelet and anticoagulation therapy should be administrated pre- and post-procedure as suggested in these instructions and carried out in accordance with the MAVErIC protocols; however, all medication regimens are at the discretion of the physician. Special consideration should be given to those patients with recently active gastritis or peptic ulcer disease.*

8.4 Pre-procedure

Patient preparation and sterile precautions should be the same as for any angioplasty procedure. The placement of the carotid stent in a stenotic or obstructed carotid artery must be done in a procedure room with angiography capabilities. Angiography should be performed to map out the extent of the lesion and the collateral flow. If thrombus is present, do not proceed with stent deployment. Access vessels must be sufficiently patent or sufficiently recanalized to proceed with further intervention.

8.5 Inspection Prior to Use

1. Inspect the temperature indicator on the inner pouch.

   WARNING: *Do not use if the temperature indicator has changed from a gray square to a black square.*

   CAUTION: *The Medtronic Vascular Exponent® Self-Expanding Carotid Stent with RX Delivery System is only to be used in conjunction with a Medtronic carotid distal embolic protection system with 0.014" guidewire.*

2. Remove the Exponent Self-Expanding Carotid Stent with RX Delivery System from its protective packaging. Lay the device flat. Take care not to kink the shaft of the delivery catheter system. Do not remove the wire stylet from the catheter at this time.

   CAUTION: *Carefully inspect the Exponent Self-Expanding Carotid Stent with RX Delivery System to verify that the device has not been damaged in shipment. Do not use damaged equipment.*

   CAUTION: *The delivery system has an internal hypotube. Take care to avoid unnecessary handling which may kink or damage the delivery system. Keep the delivery system as straight as possible and the delivery handle stationary during deployment. Do not use if device is kinked.*

3. Inspect the delivery system sheath to verify that it has not been damaged during shipment and that the stent does not overlap the proximal marker. Ensure that the stent is fully covered by the sheath and that the wire stylet is within the inner guidewire lumen.

   CAUTION: *Special care must be taken not to handle or in any way disrupt the stent on the delivery system. This is especially important during delivery system removal from packaging, placement over the distal embolic protection device wire, stylet removal and advancement through an RHV and guiding catheter hub.*

   CAUTION: *The stent on the delivery system is intended to perform as a system. Do not remove the stent from the delivery system as removal may damage the stent. If removed, the stent cannot be put back on the delivery system.*

4. Ensure that the slider button is in the locked position at the front of the handle. Verify that the stent is the correct diameter and length by reading the specifications on the handle at the strain relief portion of the delivery system. Do not use if any defects are noted.

   CAUTION: *Leave the slider button in the locked position until the stent is ready to be deployed.*

8.6 Preparation

CAUTION: *Do not expose the delivery system to organic solvents as structural integrity and / or function may be impaired.*

8.6.1 Delivery System Preparation

1. Keep the wire stylet in the guidewire lumen.
2. Fill a 10 cc syringe with heparinized normal saline and inject the saline through the luer fitting at the proximal end of the handle. Flush until fluid is observed exiting the delivery system at the guidewire exit.
3. Firmly pinch the guidewire exit port on the delivery catheter between the thumb and forefinger. Vigorously flush the system again until fluid is observed exiting at both the wire stylet and the distal end of the sheath. Carefully remove the wire stylet from the delivery system by pulling the wire out of the lumen.

   CAUTION: *Do not hold the sheath or stent during wire stylet removal.*

4. Flush the system again after the wire stylet is removed and verify fluid exiting the distal tip of the delivery system. If the wire stylet does not remove easily, do not use the system.

   CAUTION: *Ensure that the stent delivery system is fully flushed with heparinized saline prior to use. Do not use the delivery system if flush is not visible exiting at the distal end of the sheath.*
5. Gently slide the E-Z Place valve relief forward over the delivery system shaft until it stops. Do not force the forward movement.
6. Keep the device straight and flat to avoid kinking the shaft.

8.6.2 Distal Embolic Protection System Preparation

The Exponent Self-Expanding Carotid Stent with RX Delivery System is indicated for use in conjunction with a Medtronic distal carotid embolic protection system. Please refer to the Instructions for Use for the specific embolic protection system for information on device preparation and placement.

WARNING: *Allow for and maintain adequate distance between the distal embolic protection system and the stent delivery system or the deployed stent in order to prevent possible entanglement. If entanglement occurs between the distal embolic protection device and the stent, surgical conversion for removal of the stent should be considered.*

WARNING: *The distal embolic protection device should be in place prior to insertion of either a predilatation balloon or stent delivery system into the patient.*

8.6.3 Lesion Preparation

WARNING: *Administer heparin dose sufficient to maintain an ACT of ≥ 250 secs to prevent thrombus formation on the devices.*

CAUTION: *Venous access should be available during carotid stenting to manage bradycardia and/ or hypotension by either pacemaker placement or pharmaceutical intervention, if needed.*

CAUTION: *The Exponent Self-Expanding Carotid Stent with RX Delivery System must be used with a guiding catheter or introducer sheath to maintain adequate support of the 0.014" guidewire or embolic protection device throughout the procedure.*

CAUTION: *Use with bleedback control hemostatic valves is not recommended.*

CAUTION: *When catheters are in the body they should only be manipulated under fluoroscopy. Radiographic equipment that provides high-quality images is needed.*

WARNING: *Maintain continuous flush while removing and reinserting devices on the guidewire or embolic protection device. Perform all exchanges slowly to prevent air embolism or trauma to the artery.*

1. If needed, pre-dilate the lesion with an appropriate size balloon dilatation catheter to a minimum of 2.5 mm after the distal protection device is in place beyond the lesion.

Note: *If no predilatation balloon is utilized, there must be a minimum luminal opening of 2.5 mm to enable passage of the stent delivery system.*

2. Maintain the embolic protection device wire and withdraw the balloon dilatation catheter.

8.7 Delivery Procedure

1. If lesion pre-dilatation has been performed, removed the balloon catheter and back-load the stent delivery system onto the 0.014" (0.36 mm) embolic protection device wire. The wire will exit the delivery system approximately 28 cm from the distal tip.

   CAUTION: *The delivery system is not designed for use with a power injector. Use of a power injector may adversely affect device performance.*

   CAUTION: *For best device performance, the guidewire exit port should remain within the guiding catheter or sheath.*
2. Gently slide the EZ-Place valve relief over the outer shaft until it stops.
3. Keep the device flat to avoid kinking the shaft.
4. Insert the delivery system through the rotating hemostatic valve adapter.
5. Tighten the hemostatic valve adapter over the EZ-Place valve relief to ensure that the hemostatic valve adapter does not clamp down on the outer sheath and impede its movement. The EZ-Place valve relief also limits back flow of blood.

   CAUTION: *Do not over-tighten the hemostatic valve adapter over the EZ-Place valve relief. Do not aspirate blood through the hemostatic valve adapter when the EZ-Place Valve Relief is within the hemostatic valve. This could result in air embolism.*
6. To avoid kinking of the stent delivery system, stabilize the hub of the guiding catheter or introducer sheath, hold the catheter shaft just proximal to the EZ-Place Valve Relief and use short strokes to advance the delivery catheter over the immobilized guidewire of the distal protection device.

   CAUTION: *If resistance is met during delivery system introduction, the system should be withdrawn and another system used.*
7. Advance the stent and delivery system forward under fluoroscopic guidance to the lesion site.

8.8 Stent Deployment

WARNING: *Ensure optimal positioning of the stent prior to deployment. Once deployment is initiated, the stent cannot be repositioned or recaptured. Stent retrieval methods (use of additional wires, snares and/ or forceps) may result in additional trauma to the carotid vasculature and/ or vascular access site. Complications may include death, stroke, bleeding, hematoma, or pseudoaneurysm.*

CAUTION: Once stent placement has been initiated, *do not attempt to pull a partially expanded stent back through the guiding catheter or sheath as dislodgement of the stent from the delivery system may occur.*

1. Confirm the stent position angiographically prior to deployment. Adjust position if necessary.

2. The stent delivery system is designed to deploy the stent using one hand. While holding the handle stationary with one hand, unlock the stent release mechanism (slider button) on the delivery handle with the thumb by rotating the button toward the center (left) of the handle. See Figure 1.

   Note: *Ensure that the delivery system is straight and not coiled and remove any slack in the system. Keep the delivery handle stationary during deployment. Do not hold the outer sheath of the delivery catheter during deployment. It must be free to move.*

3. Deploy the stent by slowly pulling back on the slider button. Continue to pull back on slider button until the slider mechanism reaches the end of the slot in the handle. This will retract the external constraining (outer) sheath and allow the stent to be deployed.

   Note*: If significant resistance is encountered during pullback of the slider button and before stent release is initiated, re-lock the slider button into the handle and remove the system. Once deployment is initiated, the stent cannot be recovered by the sheath.*

   CAUTION: *In the event of partial delivery of the stent as the result of the inability to fully deploy the stent, remove the entire delivery system from the patient. This may result in damage to the vessel wall and may require surgical intervention.*

4. Once the stent is deployed, carefully withdraw the distal tip of the delivery system through the stent. Return the deployment button to the locked position. This will re-sheath the delivery catheter and allow for removal of the system into the guiding catheter or sheath. Remove the delivery system from the patient.

5. Under fluoroscopy, confirm that the stent has been deployed at the target lesion.

6. If additional stent-to-wall apposition is desired or to facilitate the use of other interventional devices, the stent can be post-dilated with a dilatation catheter. Do not expand the stent beyond its unconstrained maximum diameter as stated on the label and in Table 1. Post-dilate as needed in accordance with the compliance chart accompanying the selected balloon catheter.

   CAUTION: *When more than one stent is required to cover the lesion or if there are multiple lesions, the distal lesion should be stented first followed by stenting of the proximal lesion. Stenting in this order obviates the need to cross the proximal stent in order to place the distal stent and reduces the chance of dislodging stents that have already been placed.*

   CAUTION: *If overlap of sequential stents is necessary, the amount of overlap should be kept to a minimum (approximately 5 mm). In no instance should more than two (2) stents overlap.*

   CAUTION: *Care must be exercised when crossing a newly depolyed stent with other interventional devices to avoid disrupting the stent geometry and placement of the stent.*

   WARNING: *Overstretching of the artery may result in rupture and life-threatening bleeding.*

8.9 Post-Stent Placement

1. Following stent placement, an angiogram should be performed to confirm vessel patency and percent stenosis remaining in the vessel lumen.

   WARNING: *The stent may cause a thrombus, distal embolization or may migrate from the site of implant down the arterial lumen. Appropriate sizing of the stent to the vessel is required to reduce the possibility of stent migration. In the event of thrombosis of the expanded stent, thrombolysis and PTA should be attempted.*

2. Upon completion of the angiogram, the embolic protection device should be removed in accordance with the instructions for use with that device.
3. Patients should be put on an appropriate regimen of anticoagulants / antiplatelets such as that described in Section 8.3 .

WARNING: *In the event of complications such as infection, pseudoaneurysm, or fistulization, surgical removal of the stent may be required.*

WARNING: *The long-term performance (> 1 year) of the Exponent Self-Expanding Carotid Stent has not been established.*

9.0 PATIENT INFORMATION

In addition to these Instructions for Use, the Exponent Self-Expanding Carotid Stent with RX Delivery System is packaged with a Patient Implant Card for the patient that contains specific information about the Exponent Self-Expanding Carotid Stent. All patients should keep this card in their possession at all times for the procedure / stent identification.

A Patient Guide, which includes information on carotid artery disease and the carotid stent implant procedure using distal embolic protection, is available from Medtronic Vascular upon request. Please contact Customer Service at 1-(888) 283-7868 to obtain copies.

10.0 HOW SUPPLIED

Sterile: This device is sterilized with electron beam radiation. Non-pyrogenic.

Contents: One (1) Exponent Self-Expanding Carotid Stent with RX Delivery System

Storage: Store in a dry, dark, cool place.

11.0 PATENTS

Protected by United States Patents 5,203,774; 6,306,141. Additional patents pending in the United States as well as other countries.

DISCLAIMER OF WARRANTY

NOTE: ALTHOUGH THE CAROTID STENT SYSTEM, HEREAFTER REFERRED TO AS "PRODUCT," HAS BEEN MANUFACTURED UNDER CAREFULLY CONTROLLED CONDITIONS, MEDTRONIC INC. AND ITS RESPECTIVE AFFILIATES (COLLECTIVELY "MEDTRONIC") HAVE NO CONTROL OVER CONDITIONS UNDER WHICH THIS PRODUCT IS USED. MEDTRONIC, THEREFORE, DISCLAIMS ALL WARRANTIES, BOTH EXPRESSED AND IMPLIED, WITH RESPECT TO THE PRODUCT, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. MEDTRONIC SHALL NOT BE LIABLE TO ANY PERSON OR ENTITY FOR ANY MEDICAL EXPENSES OR ANY DIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES CAUSED BY ANY USE, DEFECT, FAILURE OR MALFUNCTION OF THE PRODUCT, WHETHER A CLAIM FOR SUCH DAMAGES IS BASED UPON WARRANTY, CONTRACT, TORT OR OTHERWISE. NO PERSON HAS ANY AUTHORITY TO BIND MEDTRONIC TO ANY REPRESENTATION OR WARRANTY WITH RESPECT TO THE PRODUCT.

The exclusions and limitations set out above are not intended to and should not be construed so as to contravene mandatory provisions of applicable law. If any part or term of this Disclaimer of Warranty is held to be illegal, unenforceable or in conflict with applicable law by a court of competent jurisdiction, the validity of the remaining portions of this Disclaimer of Warranty shall not be affected.

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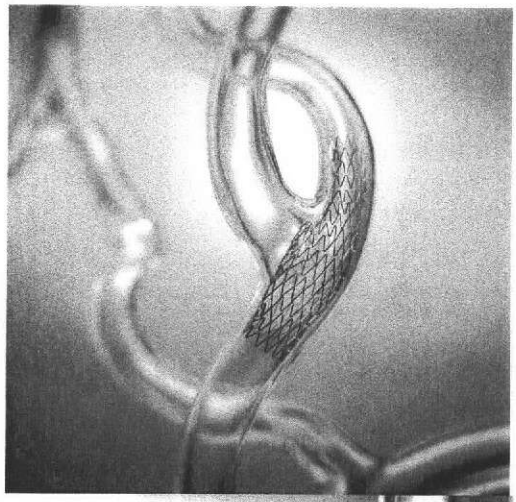
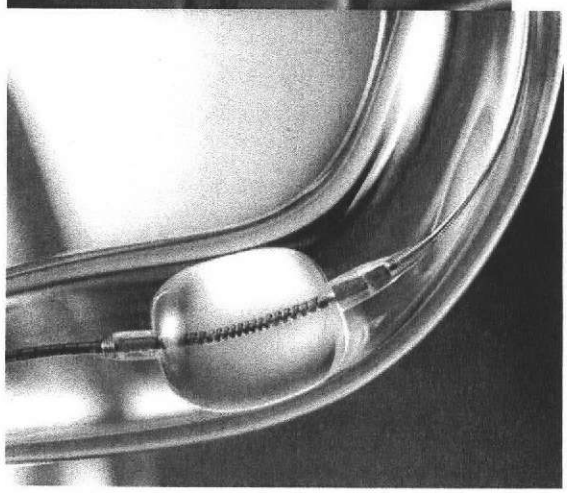
Patient Guide
to
Carotid Stenting with Distal Protection





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Introduction

You have been identified by your doctor to be a possible candidate for treatment of your carotid artery disease. A type of treatment known as an endovascular procedure may be used to treat your carotid artery disease. This type of treatment is done through your blood vessels and may use the Medtronic Exponent® Self-Expanding Carotid Stent System (Exponent Stent System) along with the GuardWire®3-6 Temporary Occlusion & Aspiration System (GuardWire Temporary Occlusion & Aspiration System).

Use of the Exponent® Carotid Stent System and the GuardWire® Temporary Occlusion & Aspiration System are intended for treatment of carotid artery disease for patients who are not candidates for treatment using current surgical options or who are considered by their doctor to be at high-risk for surgical-related complications. As with any medical procedure, there are risks and benefits to having an endovascular procedure.

This booklet will give you information on the procedure used to insert a stent into your carotid arteries using the Exponent® Carotid Stent System and the GuardWire® Temporary Occlusion & Aspiration System. Technical terms that may be unfamiliar to you are listed in the glossary at the end of this booklet.

As you read the booklet and learn about the carotid stent procedure, make a list of questions that you might want to ask your nurse or doctor. There is a place at the back of this booklet for questions and reminders.

1. The Carotid Arteries and Your Brain

Your brain is the control center of your body and controls all functions of your body. If blood flow is slowed or obstructed to any part of your brain, your brain loses its energy supply and may become injured. The ***carotid arteries*** are the arteries that bring oxygen and nutrients in your blood to nourish your brain. They are located on either side of your neck next to your windpipe. For normal function of your brain to occur, adequate blood supply must flow through your carotid arteries to your brain (Figure 1).

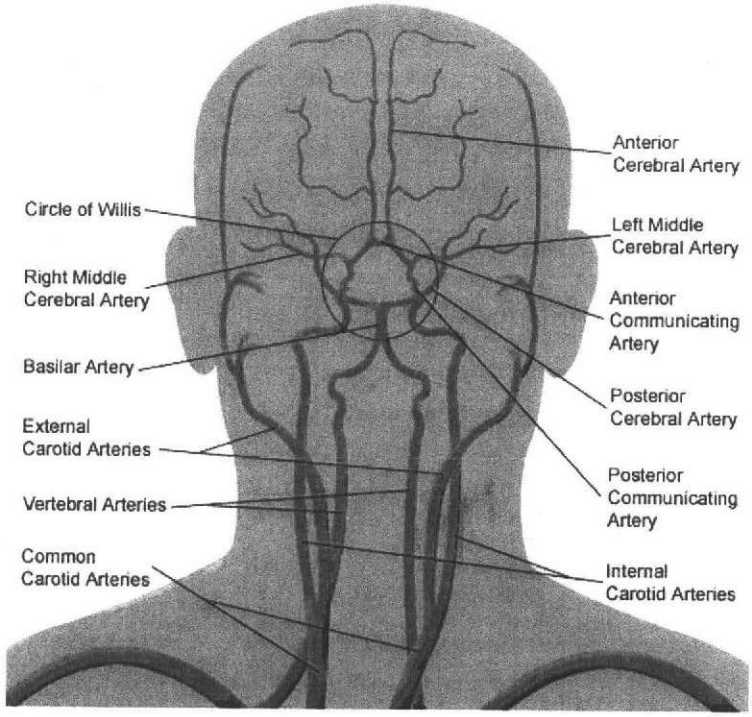

Figure 1, Arteries of the Brain

Each carotid artery begins as a single blood vessel known as the ***common carotid artery*** (Figure 2) on either the right side or the left side. The common carotid artery branches into two blood vessels- the ***external carotid artery*** and the ***internal carotid artery***. The external carotid artery mainly supplies blood to the muscles and nerves of your face, neck, tongue and scalp. The internal carotid artery supplies blood directly to the part of your brain that is responsible for speaking, thinking, your personality and the motor functions of your body.

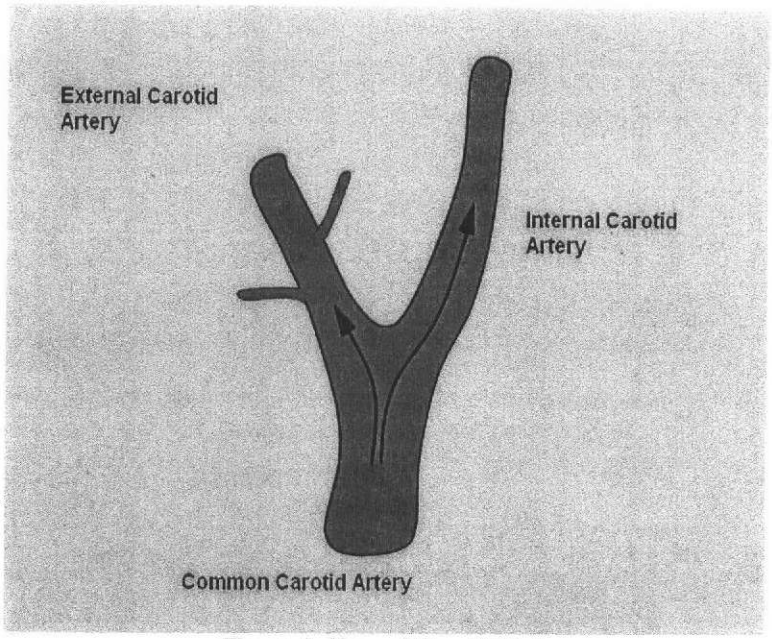

Figure 2, Normal Carotid Artery

2. Carotid Artery Disease

As people get older, deposits of cholesterol and calcium (also referred to as ***plaque***) may build up on the inside of the arteries in our body including the carotid arteries (Figure 3).

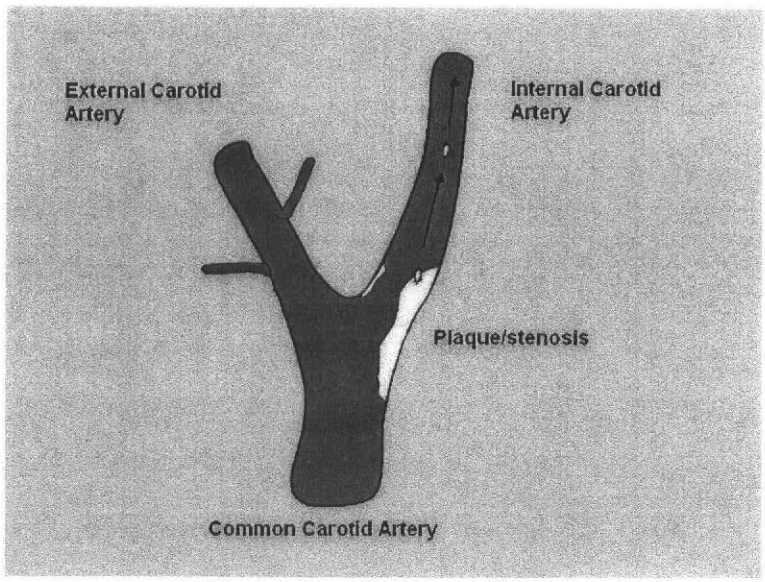

Figure 3, Carotid Artery with Plaque

Over time, these deposits (also referred to as a ***stenosis***) can become more severe and reduce the flow of blood through the carotid arteries to the brain or a piece can break off and block smaller vessels in the brain (Figure 4). If the reduced flow is significant depriving the brain of important oxygen and nutrients to keep your brain functioning properly, it can result in either a ***stroke*** or a ***TIA*** (transient-ischemic attack).

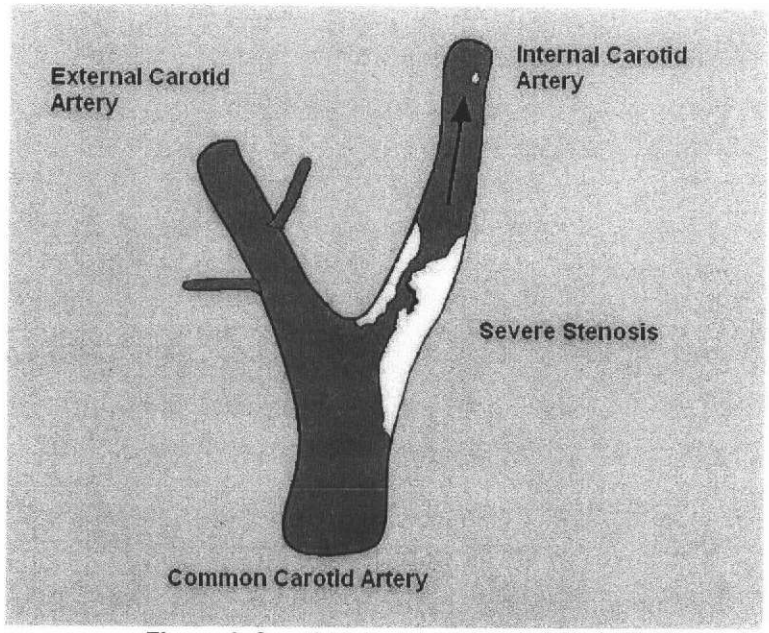

Figure 4, Carotid Artery with Severe Stenosis

2.1 Risk Factors for Carotid Artery Disease

A ***risk factor*** is something that increases your chance of developing a disease. Some risk factors, such as your age, gender, your race, your family history (your parents, siblings or other relatives who may have had a stroke) cannot be controlled by you. Other risk factors that can be modified, treated or changed by changing your personal habits may reduce the risk of developing a particular disease. These may include:

- Arterial disease, outside the heart and the main blood vessels (treated)
- Diabetes (treated and controlled)
- Heart disease such as heart attack or heart failure
- High blood pressure (treated and controlled)
- High cholesterol levels (change personal habits; treated and controlled)
- Lack of exercise (change personal habits)
- Obesity (change personal habits; treated and controlled)
- Smoking (change personal habits)

2.1.1 Lifestyle Modifications

Your doctor may recommend ways to control your risk factors for a stroke by recommending that you change your lifestyle. Lifestyle changes may include:

- Quitting cigarette smoking and use of tobacco products
- Beginning an exercise and low fat, low cholesterol diet program to lose weight or maintain a desirable weight
- Controlling diabetes, high blood pressure and cholesterol levels (good cholesterol versus bad cholesterol)
- Controlling other physical disorders such as heart disease and atrial fibrillation
- Having regular check-ups with your doctor

2.2 Symptoms of Stroke

A stroke is a medical emergency and an understanding of the warning signs or symptoms is very important to a person surviving a stroke. Stroke warning signs include

- Sudden numbness or weakness of your face, arm or leg (especially on one side of the body)
- Sudden difficulty swallowing
- Sudden confusion, difficulty speaking or slurred speech or difficulty understanding others
- Sudden difficulty seeing in one or both eyes (blurred vision or loss of vision)
- Sudden difficulty walking, dizziness or loss of balance or loss of coordination
- Sudden severe headache with no known cause

2.3 Symptoms of TIA

TIAs are sometimes referred to as "mini-strokes" or "temporary strokes". Symptoms are usually the same as for a stroke, but they are ***temporary***. Usually symptoms occur suddenly and may disappear within an hour, but may last up to 24 hours. TIAs are warning signs that you may be at high risk for having a stroke.

Call your doctor immediately if you, or a loved one, have any of the symptoms of a stroke or TIA. Immediate treatment may increase your chance of a full recovery or save your life.

3. Diagnosis

The diagnosis of a stroke involves gathering medical history information from you or your authorized family member(s) if you are unable to give it. In addition to your medical history, your doctor will perform a physical exam while asking you about any symptoms you may have had. As part of the physical exam you may also have a neurological evaluation performed to test your nerves and reflexes. There are also different tests that your doctor may use in order to make your diagnosis of carotid artery disease. These tests help your doctor to better recommend the most appropriate treatment for you. Your doctor will explain the risks and benefits of your treatment options and answer any questions that you or your family members may have.

3.1 Diagnostic tests:

- A ***CAT or CT scan*** (Computerized Axial Tomography scan) utilizes x-rays to make 3-D images of your brain. Your doctor may also choose to do a CAT scan using dye if your doctor wants to see the carotid vessels.

- A ***MRI*** (Magnetic Resonance Imaging) uses a very strong magnet to make 3-D images of your brain and gives a more detailed picture of your brain. It is able to show if areas in your brain have been damaged by a previous stroke or if there is a blockage in your carotid artery. Your doctor may also choose to do a MRI scan using dye if your doctor wants to see the carotid vessels

- A ***Doppler Ultrasound Scan*** uses high-frequency sound waves to make pictures of your blood vessels to detect blockages or narrowing in the arteries in your brain. This test is always performed outside the body (non-invasive) and is painless, unlike CAT or MRI which are minimally invasive when dye is used.

- An ***ECG*** (electrocardiogram) and other monitoring of your heart may show evidence of heart problems, such as an irregular heart rate, that may contribute to the possibility of a stroke.

4. Cerebral Arteriogram or Angiogram

A ***cerebral angiogram*** is a test that may be performed to check for narrowing or blockages in your carotid arteries. Tell your doctor if you have a known allergy to iodine or contrast dye. During this test, contrast dye is injected into the carotid arteries while x-rays are being taken. The x-ray pictures will show any blockages or narrowing in your artery (Figure 5).

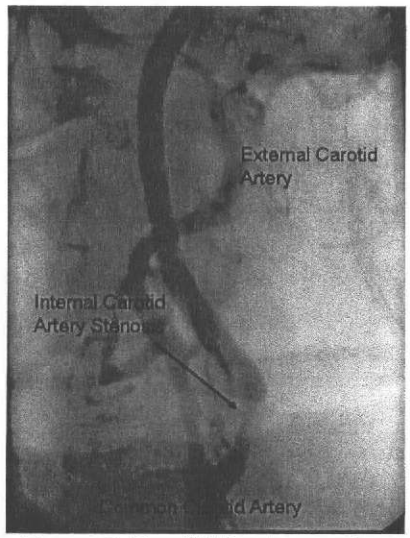

Figure 5, Carotid Angiogram Image

This test may be performed in the ***angiographic laboratory*** (angio lab) or ***catheterization laboratory*** (cath lab) - a room specially designed for this and similar procedures. It may also be done in the radiology (X-ray) department. This test may take approximately 40 minutes. During the procedure the staff and your doctor will:

- Place you on an x-ray procedure table- you will be lying down for the procedure.
- Insert a small tube (intravenous or IV) into your arm. This tube allows fluids and medication to be given to you- this may be done prior to your arrival to the cath lab or x-ray department.
- Place small sticky patches (electrodes) on your chest to monitor your heart rate and heart rhythm.
- Shave and wash the area where a catheter (hollow tube usually made out of plastic materials) will be inserted (your groin or arm) into your artery. This is usually in your groin but it may be in another area.
- Cover your body with sterile sheets.
- Give you a mild sedative to help you relax.
- Use medication (local anesthesia) to numb the area that has been cleansed- this may sting a little when the medication is injected.
- Place a tube called a 'sheath' into the artery in your groin or arm.
- Insert a catheter through the sheath into the artery in your groin or arm. Through this catheter, the doctor can move or advance guidewires (help position the catheters) and catheters to the arteries in your neck.
- Inject a dye (contrast) through the catheter to allow your doctor to see the arteries in your neck on an x-ray monitor similar to a television screen.
- After the test, you will go to a recovery area for monitoring before returning to your hospital room or going home.

5. Treatment Options for Carotid Artery Disease

In addition to changing your lifestyle to help reduce your risk factors, the treatment of your carotid artery disease is dependent on whether your symptoms are due to a TIA or a stroke. A thorough medical exam will determine this. Your doctor may recommend drug therapy, surgery or stenting- all of which can increase blood flow to your brain and reduce the risk of you having a stroke.

5.1 Medical Therapy

A standard treatment for patients at risk for stroke is to use medications such as aspirin and ***antiplatelet*** agents (blood thinners), which prevent blood platelets from attaching to the plaque in your artery. Use of these drugs lowers the risk of you forming blood clots in your arteries. Your doctor may also prescribe additional medications to lower your blood pressure or reduce your cholesterol levels in your blood. Blood thinner medicine may include drugs such as aspirin, Plavix®, Ticlid®, and Coumadin®.

5.2 Surgery (Carotid Endarterectomy - CEA)

Carotid endarterectomy (CEA) is a very common surgical procedure in which the harmful plaque causing the blockage in your vessel is removed from the inner wall of your carotid artery by a surgeon. This surgery can be done either under ***general anesthesia*** in which you will be asleep or done under ***local anesthesia*** where you will be given some medication to numb your neck and another medication to relax you but not put you to sleep. The surgery involves making a small incision into your neck and your carotid artery. The surgeon will place a clamp on the affected area of the artery. Sometimes a small tube,

called a ***shunt***, is used to divert blood flowing through the artery around the area that the surgeon is working on. The artery is then opened, and a special instrument is used to remove plaque from the inside of it to open the passageway for the blood. This restores blood flow to your brain. Your surgeon will use either sutures (stitches) or a graft made of special materials to repair your artery. The entire procedure usually takes about 1.5 to 2 hours. You may have pain near the incision in your neck and may have some difficulty swallowing during the first few days after surgery. Most patients are able to go home after one or two days, and return to work usually within a month. You should avoid driving and limit physical activities for a few weeks after your surgery. CEA has been performed in the United States for approximately 50 years.

5.3 Stent Placement (Carotid stenting)

Carotid stent placement is a procedure in which a metallic tube (a stent) is placed in the diseased area in your carotid artery. This helps to support and keep the artery open while allowing for blood to flow to your brain. Currently, there are multiple stent systems approved by the United States Food and Drug Administration (FDA) that are available for use in the carotid arteries in the United States.

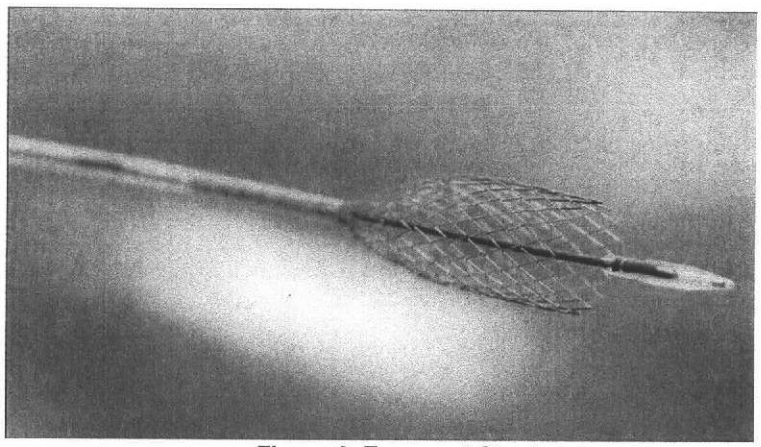

Figure 6, Exponent Stent

5.3.1 Exponent Carotid Stent Device Description

The Medtronic Exponent Carotid Stent is on a specially-designed catheter that is moved over the guidewire to the diseased area of the artery to deliver the stent. The stent is covered by a moveable plastic sleeve that surrounds it to prevent the stent from moving or expanding before your doctor places it at the correct location within your artery. The stent is made out of a Nickel-Titanium metal alloy called ***Nitinol***. Nitinol is a metal that has superior elastic properties that.when bent gives it the ability to go back to its original shape (Figure 6).

Once your doctor has the delivery catheter is in position in the lesion in your artery, the sleeve is pulled back and the stent expands by itself and compresses the fatty plaque deposits against the wall of the carotid artery. The stent keeps the artery open and aids in increasing blood flow to the brain. The stent stays in place permanently and after approximately six to eight weeks the thin lining on the inside of your artery wall will grow over the stent.

Angioplasty in the carotid artery began approximately 25 years ago and the use of stents in the carotid artery began about 15 years ago. Recent clinical studies have shown that carotid stenting is as safe and effective as CEA in those patients considered being at high-risk for surgery. Stenting does not require an incision in your neck or general anesthesia like CEA does.

5.4 Embolic Protection Device (Occlusion balloon)

The stent will be used along with a device called a ***distal embolic protection device.*** The distal embolic protection device is used to prevent or reduce the amount of ***embolic material*** (small debris made up of plaque material; also called emboli) that may travel in your blood to the small blood vessels of your brain when your doctor puts the carotid stent in your artery. This debris, made up of small pieces of plaque material, could possibly block a small blood vessel that supplies blood to your brain and could possibly cause a stroke.

5.4.1 GuardWire Device Description

The ***GuardWire®3-6 Temporary Occlusion & Aspiration System*** (GuardWire) is a flexible catheter that has a small balloon attached close to the end of it. The balloon can be inflated to block blood flow in your carotid artery during stent placement. It is temporarily placed in your artery beyond the diseased area to stop embolic material that may become loose during the placement of the stent (stenting procedure). The GuardWire is a specially designed balloon catheter that is expanded when the physician is ready to start the procedure. The expanded balloon fits in the artery against the walls and does not allow blood and embolic material to flow around it. It stops the debris that may become loose and prevents it from possibly causing a stroke. The balloon stay inflated until your doctor has finished your stent procedure. Near the end of the procedure, another catheter called the ***Export catheter*** is used to aspirate (remove by sucking into a syringe) a small amount of blood with the trapped debris and remove it from your artery. This is done to reduce the risk of TIA or stroke associated with the stenting procedure.

This catheter may also cause damage or trauma to the vessel wall. Once your doctor has aspirated the debris with the blood, he will deflate the balloon and remove the GuardWire catheter.

6. Risks versus Benefits of Carotid Stenting

It is important to understand that the decision to undergo carotid stent placement or to have CEA surgery to treat your carotid artery disease depends on many different factors. You will have to make a personal choice by weighing the risks of CEA surgery against the risks of carotid stenting while also weighing the long-term benefits of both procedures. Some patients who have carotid arterial disease are not considered to be candidates for CEA surgery because of either anatomy-related issues such as a previous CEA in the diseased area or the location of the carotid artery disease in the neck or medical-related (health) issues such as a recent heart attack, severe respiratory problems, or severe disease in the coronary arteries. Patients considered to be at high-risk for complications related to CEA surgery have been enrolled into multiple carotid stent clinical studies in the United States (U.S.). Based on the results of those studies, the U.S. Food and Drug Administration (FDA) has approved multiple carotid stent systems for use in the U.S.

Both procedures carry the possibility that you may have a ***restenosis*** of the lesion, a stroke as the result of the procedure or another adverse event associated with those procedures. Some of the similar risks for both procedures are listed in the 'Adverse Events' section below. Your doctor may recommend carotid stenting if he or she believes that you will benefit more from it than CEA and if the benefits of carotid stenting appear to outweigh the risks of you having a CEA surgical procedure. Finally, it is important to weigh the risks of carotid stenting and CEA surgery with the short-term and long-term benefits of each procedure. It is important that you discuss these benefits with your doctor to determine which procedure is more beneficial to you

Although carotid stenting is an invasive procedure, there are some procedural advantages of an endovascular procedure over that of a surgical procedure. Those advantages include the following:

- Your doctor will use local anesthesia and you will be awake during the procedure; with surgery you may have general anesthesia and be asleep during the procedure
    - Hospital recovery time is usually shorter;
    - You may go home the next day or possibly even the same day;
    - You can generally return to normal activities sooner, usually within few days
- The endovascular procedure is performed through catheters in your groin whereas surgery is an open surgical procedure
    - A very small scar in your groin versus a scar on your neck
    - As an open procedure, surgery may involve higher risks such as internal bleeding or infection.
- The risk of complications associated with an endovascular procedure is lower than those associated with a surgical procedure

- Many people who experience a complication with an endovascular procedure may have complications such as bruising where the catheter was inserted.

6.1 Possible Adverse Events of Carotid Stenting

Adverse events may happen with the use of medical devices. An ***adverse event*** is any undesirable or unwanted sign, symptom, illness, abnormal laboratory value, or other medical event that can occur in you during the stenting procedure. Some are related to the procedure and some related to the placement of the carotid stent in your body.

Adverse events may include:

- Heart attack (acute myocardial infarction);
- An allergic reaction to either the contrast medium or drugs used during the stent procedure or a reaction to the stent or catheter material;
- An aneurysm or pseudoaneurysm in vessel or at vascular access site;
- Chest pain (angina/coronary ischemia);
- An irregular heart rhythm (including premature/early beats, slow heart rate [bradycardia], or fast heart rate [atrial and/or ventricular tachycardia, atrial and/or ventricular fibrillation]);
- No heart rate (asystole) or slow heart rate (bradycardia) that may require placement of a temporary pacemaker to control your heart rate;
- Blood flow directly from the artery to the vein bypassing the capillaries (Arteriovenous fistula);
- Bleeding complications from anticoagulant or antiplatelet medication requiring transfusion or surgical intervention;
- Swelling in your brain (cerebral edema);
- Bleeding in your brain (cerebral hemorrhage);
- Decreased oxygen in the blood that goes to your brain (cerebral ischemia);
- Inability of the heart to pump enough blood to the other body organs, Congestive heart failure (CHF);
- Death;
- Detachment (breaking off) and/or implantation of a piece of the stent delivery system or distal embolic protection system;
- Tearing (dissection) of your blood vessel;
- Closing off of the distal embolic protection device because of blood clot formation (thrombosis);
- Emboli (debris), distal to diseased portion of the vessel (tissue, plaque, thrombotic material, air or stent);
- Emergency carotid artery surgery (Carotid Endarterectomy [CEA]) or surgery to remove the stent or distal embolic protection device;
- Elevated temperature (fever);
- Bleeding under your skin (hematoma) at the vascular access site- with or without surgery to repair the vessel;
- Bleeding event that may or may not require a blood transfusion;
- Hyperperfusion syndrome as the result of increased blood flow into your brain;

- High blood pressure (hypertension) or low blood pressure (hypotension);
- Local or systemic infection including bacteremia or septicemia;
- Ischemia/ infarction of tissue/ organ;
- Pain in the head or neck or severe headache on one side of the head;
- Pain at the catheter insertion site in the groin;
- Renal (kidney) insufficiency or kidney failure as the result of the contrast medium (dye) used during the procedure;
- Return of the blockage in the vessel in the stented segment (restenosis);
- Seizures;
- Damage to the stent and/or the distal embolic protection device as the result of the devices becoming entangled.
- Stent malposition (incorrect location) or stent movement (migration);
- Stroke (cerebrovascular accident [CVA);
- Thrombosis of the blood vessel (blockage or occlusion as the result of the formation of blood clots);
- Thrombosis of the stent (blockage of the stent due to blood clot formation [thrombus]);
- Transient Ischemic Attack (TIA)
- Vessel occlusion at puncture site, the stented site, or to a remote site;
- Vessel dissection (tear), perforation (hole) or rupture (tearing);
- Vessel spasm or vessel narrowing due to recoil (blood vessel attempting to return to its original shape).

6.2 CONTRAINDICATIONS FOR USE OF THE EXPONENT STENT

A ***contraindication*** is a factor that puts you at a higher risk for a possible problem. It is a reason for a person to not take a particular medication, to not have a particular procedure performed or a device used during a procedure, or to not have a particular treatment such as a surgical procedure. You and your doctor should discuss whether carotid stenting is the right treatment for you and why the use of a carotid stent may not be the right choice for you.

The Medtronic Exponent Carotid Stent is contraindicated for use in the following patients:

- Patients who cannot take anticoagulant medications or antiplatelet medications due to a medical condition;
- Patients who have severe vascular twists, turns and bends of their blood vessels (tortuosity) or patients who have a vessel anatomy that will not allow for the safe use of the medical devices used to perform stent placement (guide catheter, sheath, embolic protection device, or stent delivery system).
- Patients with a known allergy or severe sensitivity to Nitinol (nickel and/ or titanium) metal.
- Patients that have bleeding problems (disorders) that have not been corrected and could result in increased medical problems;
- Patients with a blockage (lesion) at the beginning (ostium) of the common carotid artery that needs to be treated.

6.3 PRECAUTIONS AND WARNINGS FOR USE OF THE EXPONENT STENT

There is always a chance that you may have a complication associated with an endovascular procedure. Some of the complications that may occur include:

- Blood clots or problems with restenosis that may affect blood flow in the area where the carotid stent was placed
- Bruising or infection of the groin area where the catheter was placed into your body
- Damage to the blood vessel
- Emboli moving up the vessel from where the doctor is working toward the brain, including blood clots, air, plaque material or the stent
- General complications of any endovascular procedure including an allergic reaction, bleeding, heart attack, stroke, TIA, or death

7. Your Stent Procedure

The carotid stent procedure, for treatment of your carotid artery disease, is very similar to that for the cerebral angiogram procedure described in Section 4.

7.1 Before Your Stent Procedure

When you arrive at the hospital for your procedure, you will be registered into the hospital's database system. You will be given an identification band (I.D.) and will change from your street clothes into a hospital gown. In some instances you may be admitted before the day of the stenting procedure. You will have an IV started and if you have any tests that need to be completed before the stenting procedure, such as blood work, you will have it done at this time.

Before the procedure, remember to tell your doctor if you are allergic to iodine, contrast dye, aspirin or any other medication, and any metal (nickel-titanium or stainless steel) or plastics. You will be instructed to not eat any solid food or liquids (other than water) after midnight of the day before your procedure. Be sure to take all of your prescription medications unless instructed otherwise by your doctor and to tell your doctor if you are taking any other medications.

Prior to signing your informed consent, your doctor will explain the possible risks and benefits of the procedure to you and answer any outstanding questions that you or your family may have. Be sure to follow all instructions given to you by either your nurse or doctor. You will be awake during the carotid stent placement procedure, however, a short while before your procedure you will receive some medicine (this is called a *sedative*) to help you relax- it may also cause you to become sleepy. Any other necessary medications, such as aspirin, may be given to you before the procedure as well.

7.2 During Your Stent Procedure

After you are on the x-ray table and prepared for the procedure as described in Section 4, your doctor and the hospital staff will focus on placement of the GuardWire distal protection system and the placement of the stent. Many things will be occurring at the same time. You will also receive a 'blood thinning' medication (anticoagulant) during the procedure to help prevent blood clots from forming on the wires, the catheters and other devices that are placed inside your blood vessels during the stent procedure.

- Your doctor will insert a catheter into the artery in your groin or arm. Through this catheter, your doctor can inject contrast dye, move or advance the GuardWire distal protection system and move the Exponent carotid stent to the arteries in your neck.

- Your doctor will inject the contrast through the catheter in order to take some pictures and see the arteries in your neck and brain again on the x-ray monitor. This allows your doctor to verify where the GuardWire distal protection system and the Exponent carotid stent need to be placed. Your face may feel warm when the contrast is injected but that feeling will go away after a short period of time.

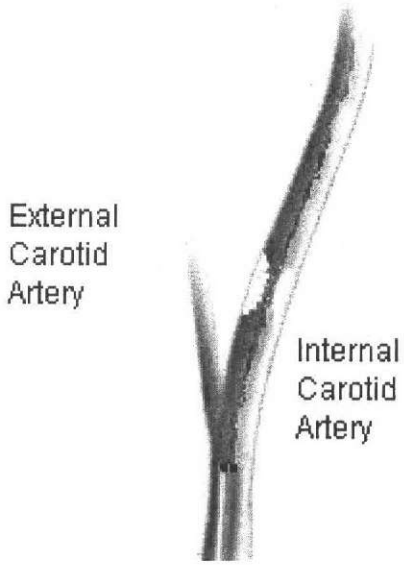

Figure 7, GuardWire across Lesion

- After the pictures are taken and your doctor determines you are a candidate to have a carotid stent implanted, your doctor will first place the GuardWire distal protection system into your carotid artery. It will be placed beyond (distal to) the blockage (Figure 7). The GuardWire distal protection system includes a small balloon that is inflated in your carotid artery to block any plaque debris from going to your brain (Figure 8). You should tell your doctor and the staff if you feel dizzy or light-headed when the balloon is inflated in your carotid artery.

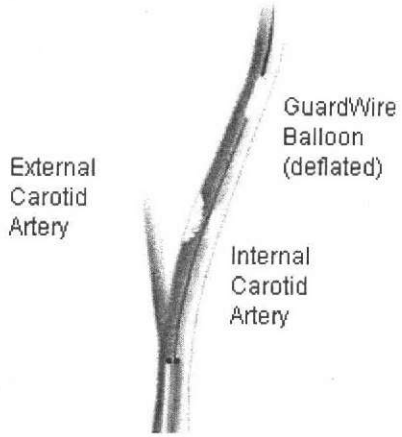

Figure 8, GuardWire Balloon in Position

- Once the GuardWire distal protection system is in your artery and the balloon is inflated, your doctor may first use an angioplasty balloon catheter to open up your artery by inflating the balloon on the catheter to stretch-open (dilate) your blood vessel and compress (squish) the plaque against the blood vessel wall. This catheter will then be removed from your body prior to the Exponent carotid stent system being placed into your artery.
- Once the balloon catheter is removed, your doctor will place the Exponent carotid stent system over the GuardWire and bring it to the area of the plaque. The stent will be expanded while the GuardWire balloon is still inflated in order to prevent any debris that may be released from traveling up to your brain (Figure 9). The stent is intended to stay inside your blood vessel to keep the blood vessel open while squishing the plaque against the wall of the blood vessel.

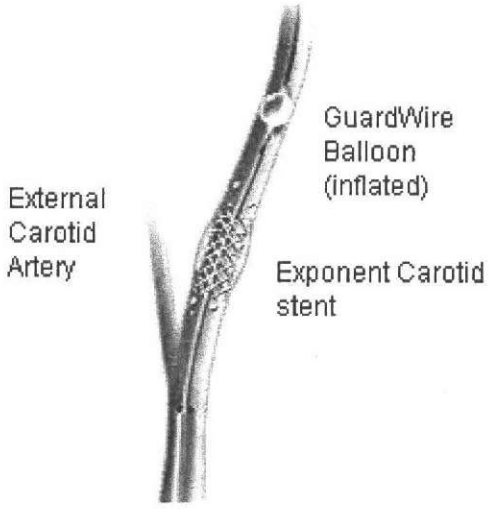

Figure 9, Exponent Stent Expansion

- Your doctor will then remove the Exponent carotid stent delivery system leaving the expanded stent in your artery. He will then use another catheter called an aspiration catheter over the GuardWire distal protection system to remove a small amount of blood that contains the plaque debris prior to deflating the GuardWire balloon (Figure 10).

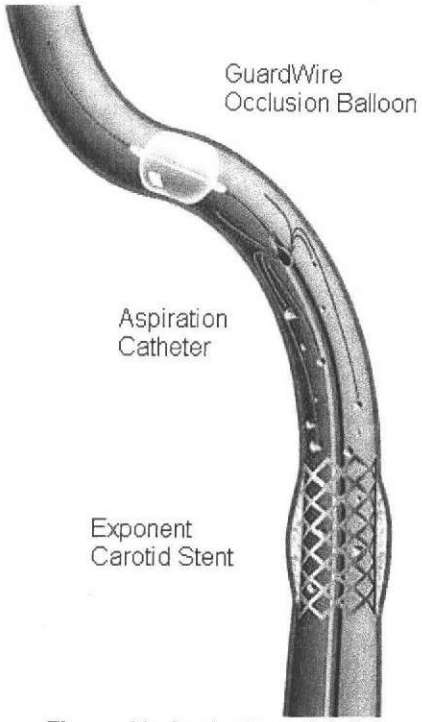

Figure 10, Aspiration of Debris

- Once this is completed your doctor will deflate the GuardWire balloon, remove it from your carotid artery and remove it from your body leaving the stent in place in your carotid artery (Figure 11 and 12).

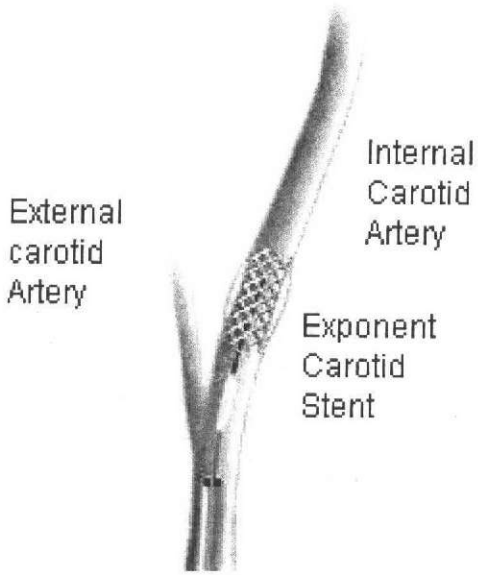

Figure 11, Removal of the GuardWire

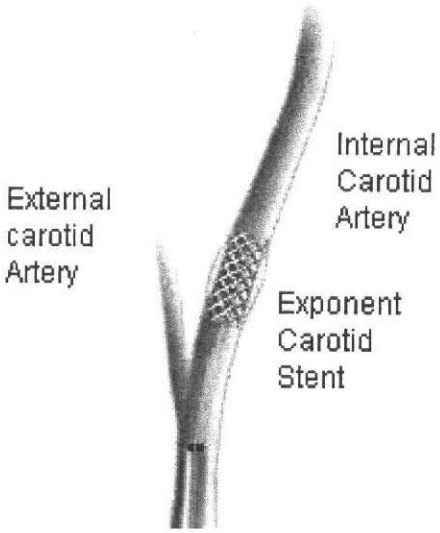

Figure 12, Exponent Carotid Stent in Vessel

- After the stent placement is completed, you will go to a special recovery area for close observation (monitoring) before you return to your hospital room or go home. The nurses and your doctor will monitor you closely as the sedative wears off and you are more awake. They will monitor your blood pressure, your heart rate, the level of pain and/or alertness, and the area in your groin where the catheter was inserted. They will also check your neurological status by asking you questions and asking you to move your fingers, toes, and other body parts. Your pupils will also be checked by shining a light in your eyes to check your pupils.

- Your doctor will remove the sheath from your groin after the anticoagulant medicine has worn off. This will help to decrease bleeding after the sheath is removed. Your doctor may choose to use a special device called a ***closure device*** to close the small hole in your artery caused by the sheath. Slight pressure will be applied to this area until the small amount of bleeding stops.

8. After Your Stent Procedure

Once your procedure is complete, you will be placed on bed rest for a limited amount of time before being discharged home. You may need to take medications before and after your stent placement procedure. Aspirin and antiplatelet drugs (platelet inhibitors) are the most commonly prescribed medications and you will take need to take these while you are in the hospital and after you go home. The purpose of these medications is to prevent blood clots (thrombus) from forming in the area of the stent placement. While taking these medications, you may need to have periodic blood tests.

Your doctor or nurse will give you instructions about your medications and how you should take them before you leave the hospital. If the medications cause you to be sick to your stomach (nauseous) or to throw-up (vomit) or make you feel 'funny' or different, notify your doctor immediately. Do not stop taking your medicine unless your doctor tells you to do so.

It is very important that you take all of your medications until your doctor tells you to stop taking them.

8.1 While you are in the hospital

After the stenting procedure and before you go home you will be given instructions on your diet, your activities and your medications for when you are at home. While in the hospital, the following will occur:

- You will need to drink large amounts of fluids to help wash the contrast dye out of your body.
- You will be instructed to not bend your arm or leg, depending on where your doctor inserted the catheters. You will need to remain in bed for a few hours with your affected leg or arm straight in order for your incision to heal and to reduce bleeding possibilities. You will be allowed out of bed when the nursing staff and your doctor have determined that an appropriate amount of time has passed and that the risk of bleeding is at a minimum.
- Be sure to let your nurse and doctor know if you have any difficulty swallowing or speaking, a severe headache, any dizziness, any weakness or sudden numbness of your legs or arms on one side of your body, any blurred vision or blindness in either one eye or both eyes or any pain at the site in your groin or arm where the catheters went in.
- You may need to remain in the hospital from one to three days after the stenting procedure.

Before you leave the hospital, if you have any questions or feel that you do not understand the instructions to follow, you should be sure to clarify these with your doctor or hospital nursing staff.

9. Going home from the hospital

After you leave the hospital, your doctor will continue to monitor your progress. The majority of patients who go home after a successful stent implantation procedure have no additional problems. If you have any of the following symptoms, contact your doctor immediately. If your doctor is unavailable, call 911 or your local emergency service to have them take you to the nearest hospital emergency room.

- Neck pain
- Severe headache with no known cause
- Discomfort (pain) or bleeding from your puncture site in either your groin or arm
- Any symptoms of TIA or stroke:
    - Sudden numbness or weakness of your face, arm or leg (especially on one side of the body)
    - Sudden difficulty swallowing
    - Sudden confusion, difficulty speaking or slurred speech or difficulty understanding others
    - Sudden difficulty seeing in one or both eyes (blurred vision or loss of vision)
    - Sudden difficulty walking, dizziness or loss of balance or loss of coordination

Remember to continue to take all your medications after you get home. Because your medications are a very important part of your ongoing treatment, it is important to continue your medication schedule as prescribed by your doctor. Do not stop taking the medications without speaking with your doctor first. Should it be required, your doctor may need to prescribe new medications for you to take that have less unpleasant reactions.

Remember to keep all scheduled appointments with your doctor and other medical personnel that your doctor may have made for you. You may need to have a follow-up duplex ultrasound scan or an angiogram to be sure that your carotid artery and the stent remain open and that you have sufficient blood flow to your brain. In a small number of patients, the narrowing in the carotid artery returns within the first six to twelve months- this is called '***restenosis***'. Should this occur, you will have a return of the symptoms that you originally had before your stent placement procedure. Notify your doctor if you are suspicious of this or if you have any questions regarding restenosis.

If you need to have a MRI or MRA scan, please inform the medical staff that you have an Exponent Carotid stent and refer them to your stent implant card. Should you need to have a MRI, you can have one anytime after your stent is implanted. The Exponent Carotid stent is "MRI conditional". Also, be sure to inform the person running the MRI machine that you have an Exponent Carotid stent so that they can make any necessary adjustments to the MRI equipment.

Be sure that your doctor always has your correct address and/or telephone number so that you can be contacted if any additional information regarding your stent becomes available in the future.

9.1 Your Stent Implant card

You will receive a ***stent implant card*** prior to leaving the hospital. This card has information regarding your stent and the stenting procedure. The implant card also contains the name and telephone number of your doctor, the date of your procedure, the location of the stent in your carotid artery and the hospital where it was implanted. It is important to keep the implant card with you at all times. Be sure to let hospital staff know that you have a stent if you have a need to go to the hospital for any reason in the future. Also, be sure to tell any dentist that treats you that you have an Exponent Carotid stent implanted in your neck. There are also telephone numbers on the card that your doctor can call if he or she has any questions regarding the stent.

10. Definitions of Medical Terms

Acute: Having a rapid onset

Adverse Events: Any unwanted experience or event associated with the stenting procedure

Aneurysm: Localized, blood-filled dilation (bulge) of a blood vessel caused by disease or weakening of the vessel wall

Angina: Chest pain or discomfort that occurs when your heart muscle does not get enough blood

Angiogram: A procedure in which x-ray pictures are taken of your blood vessels; contrast (dye) is injected into the arteries through a catheter and is used to help doctors evaluate the number and severity of blockages in your arteries

Angiographic Suite: A special room having x-ray equipment for taking angiograms and for performing catheter-based endovascular procedures

Angioplasty: A procedure in which a small balloon mounted on a catheter is passed to the area of blockage in an artery and used to open the vessel; also called PTA (percutaneous transluminal angioplasty)

Anticoagulant: A medication used to slow down your blood from clotting, also known as a blood 'thinner'

Antiplatelet Agents: A medication used to prevent platelets in your blood, from sticking together to form thrombus in your artery

Arrhythmia: An irregular heart beat or a loss of the rhythm of the heart

Artery/Arteries: A blood vessel that carries oxygen and nutrient-rich blood away from the heart to the entire body

Arterial Disease: A disease that involves thickening or hardening of the arteries or buildup of plaque within the arteries; see *atherosclerosis*

Arteriovenous Fistula: A connection between an artery and a vein in which blood flows directly from the artery into the vein bypassing the capillaries

Aspirate: To remove by aspirating or sucking in

Aspiration: The process of sucking in a small amount of blood with the trapped debris through a syringe

Aspiration Catheter: A catheter used for aspiration of debris during the stenting procedure

Asystole: A state in which the heart muscle does not contract; thereby not pumping blood to the body; cardiac standstill

Atherosclerosis: A build up of fatty materials inside the blood vessel wall that may cause narrowing and hardening of the arteries

Atrial/ Ventricle Fibrillation: Irregular rhythm of contraction of the atria (upper chambers) or ventricles (lower chambers) of the heart

Atrial/ Ventricle Tachycardia: Rapid heart rhythm that occurs in either the atria or the ventricle portion of the heart

Bacteremia: The presence of bacteria in the blood

Balloon Catheter: A small tube with a balloon attached to the tip that is inflated to open the narrowing (blockage) in the artery during an endovascular procedure.

Blockage: An obstruction of blood flow in the arteries due to plaque buildup

Blood Clots: A formation of blood platelets that results in small, bead-like obstructions of blood, blocking flow in the blood vessels

Blood Platelets: A particular type of cell in the blood that causes clotting

Blood Pressure: The pressure or force exerted by the blood on the walls of your blood vessels

Blood Thinner: Medicine that slows down the clotting of blood used before, during and/or after the endovascular procedure

Blood Vessels: The part of your body that serves to transport blood to or from the heart throughout the body consisting of the arteries and the veins

Bradycardia: A slowing of the heart rate of less than 60 beats per minute in an adult human

Calcium : A mineral in your body and blood that could build up in the arteries to result in plaque formation and an obstruction

Carotid Arteries: The major arteries located on either side of your neck that run up to the brain; they are responsible for supplying oxygen and nutrient rich blood to the brain. The common carotid artery divides into the internal and external carotid arteries

Carotid Artery Disease: A condition in which the carotid arteries in your neck become narrowed or blocked by plaque and reduces blood flow to the brain

Carotid Endarterectomy (CEA): A common surgical procedure in which plaque is removed from the inner wall of the carotid artery through an open incision

CAT Scan or CT Scan

Computerized Axial Tomography' scan	A diagnostic test in which x-ray is used along with a computer to make scanned 3-D images of the inside of the body; to see blood vessels an X-ray dye (contrast) must be used.

Catheter: A hollow, flexible tube used during the endovascular procedure to allow the doctor to inject contrast, move or advance small wires or other devices; see also *balloon catheter* and *guiding catheter*

Catheterization Lab: A room in a hospital or clinic that has x-ray equipment to support the stent placement procedure; see also *angiographic suite*

Cerebral Angiogram: A cerebral angiogram (or arteriogram) is a particular diagnostic test that produces images of blood flowing though the arteries in the brain or head

Cerebral Edema: An excess accumulation of fluid in the intracellular and/or extracellular spaces of the brain

Cerebral Hemorrhage: Bleeding into the brain tissue

Cerebral Ischemia: A condition where the brain or parts of the brain do not receive enough oxygen containing blood flow to maintain normal brain function

Cerebrovascular: The series of blood vessels in the brain

Cerebrovascular Accident (CVA): a sudden loss of consciousness resulting when the rupture or occlusion of a blood vessel leads to lack of oxygen in the brain. CVA is also referred to às stroke

Cholesterol: A soft, waxy substance found among the lipids (fats) in the bloodstream and in all your body's cells

Closure Devicesee *vascular closure device*

Common Carotid Artery: The main artery that supplies the head, neck and brain with oxygenated blood; divides in the neck to form the *external* and *internal carotid* arteries

Congestive Heart Failure: A condition in which the heart is unable to pump enough blood to your body's other organs

Contraindication: A condition or factor that increases the risks involved in carrying out a medical procedure

Contrast (dye): A liquid x-ray dye used to view the carotid arteries during an endovascular procedure, MRI or CAT scan

Coronary Ischemia: A medical condition in which there is insufficient blood supply to the coronary arteries resulting in lack of oxygen to the heart muscle

Debris: The fragments of plaque that may travel through the blood vessel to the brain and could result in a stroke; see also *embolus*

Deposits: An accumulation of plaque on the blood vessel walls

Diabetes: A disease in which the blood glucose, or sugar, levels are too high in the body

Diagnosis: The act or process of identifying or determining the nature and cause of a disease or injury through evaluation of patient history, examination, and review of laboratory data

Diagnostic Tests: Tests conducted to aid in the diagnosis of a disease

Dilating/Dilation: The process of opening a narrowing in a vessel by pushing plaque against the vessel wall by means of an endovascular device

Dissection: A cut to the blood vessel; can be intentional or unintentional

Distal Embolic Protection Device: A catheter-based device used during the carotid artery stent placement procedure to capture and remove emboli that may be released during the procedure

Doppler Ultrasound Scan: A painless, non-invasive procedure that uses high-frequency sound waves to create an image; used to detect blockages or narrowing in the arteries and diminish blood flow to the brain; also called *carotid duplex scan*

Drug Therapy: Treatment of a disease process through the administration of drugs, chemicals, and/or antibiotics

ECG (electrocardiogram): A test that monitors and records the electrical activity of the heart (responsible for your heart rhythm and rate) on a graph

Embolic Protection Device: A device that is used during an endovascular procedure to capture the particles of debris released during use of a balloon catheter or placement of a stent

Embolus/ Emboli (plural): A small piece of broken plaque material, blood clot or air bubble that travels to another part of your blood vessel and may block blood flow to the brain to cause a stroke

Endovascular Procedure: A minimally invasive (non-surgical) procedure done through the blood vessels

External Carotid Artery: An artery in the head and neck that starts at the common carotid artery and carries blood and oxygen to the face, tongue, and head

General Anesthesia: Drugs that cause sedation (loss of feeling or awareness by putting you to sleep) generally used during surgical procedures such as a *carotid endarterectomy*

Graft: A surgical procedure used to transplant a piece of tissue not having a blood supply to another location; can also be man-made materials

Groin: The region of the body that includes the upper part of the front thigh and lower part of the abdomen; a common location for catheter insertion during an endovascular procedure

Guidewire: A flexible small diameter wire used to position a catheter during an endovascular procedure (stent placement)

Guiding Catheter: A larger catheter used to introduce smaller catheters or other devices such as stents, embolic protection devices or balloons

Heart Attack: Damage to the heart that occurs when the oxygen-carrying blood flow to a section of heart muscle becomes reduced or blocked; see also *myocardial infarction*

Heart Failure: A condition in which the heart has lost the ability to pump enough blood to the body's tissues

Hematoma: A localized swelling filled with blood resulting from a break in a blood vessel

Hemorrhage: Bleeding

Hemorrhagic event: An event involving excessive bleeding

Hyperperfusion Syndrome: A condition in which there are the symptoms of a stroke due to the result of increased blood flow into the brain as the result of either the stent or CEA procedure

Hypotension/ Hypertension: An abnormally low/ high blood pressure

Infarction of tissue/ Organ: A process that results in the death of cells in the tissue/ organ as the result of blood supply

Infection (Local or Systemic): Invasion by and multiplication of microorganisms either in a small area (local) or over a large part of the body (systemic)

Informed Consent: A legal consent or agreement given by the patient that allows for a medical procedure; obtained after the patient understands the relevant medical facts and the risks involved

Inject: A method of putting liquid (medicine or contrast) into the body using a syringe that punctures the skin or through a catheter during an endovascular procedure

Internal Carotid Artery: An artery in the neck and head that begins at the common carotid artery and carries oxygen and nutrient-rich blood to the brain

Intravenous (IV): Into a vein; usually refers to the injection of fluid or medication used during an endovascular procedure

Iodine: A substance that is used as a contrast dye during an endovascular procedure

Ischemia: A restriction in blood supply resulting in a lack of oxygen to a body part

Ischemic: Pain caused from restricted blood flow through the arteries to a muscle or organ

Local Anesthesia: A method of preventing pain by numbing a specific area of the body while allowing you to remain awake; generally used in *endovascular procedures* such as carotid stenting

Malposition: Abnormal position of a device from its intended location

Medical History: Information gained by a physician or other healthcare professional, with the aim of formulating a diagnosis and providing medical care to a patient

Migration: Movement of a device from the original intended location to another location

MRI (Magnetic Resonance Imaging): A non-invasive test that uses a strong magnetic field to obtain images of the inside of your body to make three-dimensional images of body parts. In order to see blood vessels an X-ray dye (contrast) must be used; also called an MRA

Muscles: Tissue in the body that is used to produce force and achieve motion

Myocardial Infarction: Also known as a heart attack; occurs when the blood supply to a part of the heart is interrupted and the tissue dies.

Nerves: A cordlike bundle of fibers that conduct information to various parts of the body

Neurological Evaluation: An assessment of your neurological function, to test your nerves and reflexes

Neurological Status: The status of your nerves and reflexes, to check if they are functioning appropriately

Nickel: A medical grade metal used with Titanium to make a Nitinol stent

Nitinol: Nickel-Titanium alloy

Non-invasive Procedure: A procedure that is performed outside the body and does not require introduction of devices into the body

Obesity: A condition that involves increased body weight caused by excessive accumulation of fat

Occlusion: A blockage in the artery that prevents the flow of blood

Pacemaker: A medical device that uses electrical impulses to regulate the beating of the heart

PTA (Percutaneous Transluminal Angioplasty): A procedure in which a balloon catheter is passed into an area of narrowing or blockage and used to open the vessel by inflating the balloon; also referred to as *angioplasty*

Perforation: A hole made by puncturing the vessel wall

Physical Exam: The process by which a healthcare provider investigates your body for signs of disease

Plaque: A buildup of fatty deposits on the wall of a blood vessel that causes a narrowing of the artery

Plaque Debris: Fragmented plaque, normally formed when plaque is disturbed during the stent placement procedure

Platelet Inhibitors: Drugs that are commonly prescribed to prevent platelets from forming blood clots at the area of stent placement

Pseudoaneurysm: The out pouching (dilation) of a blood vessel that involves a defect in its two innermost tissue layers; also known as a *false aneurysm*

Radiology: A medical specialty directing medical imaging technologies to diagnose and sometimes treat diseases through the use of x-ray

Renal Failure: A condition in which the kidney(s) fails to function adequately

Restenosis: The return of a narrowing or blockage in an artery after treatment is complete

Risk Factor: Something that increases your chance of developing a disease or medical condition

Rupture: A tearing or break of apart, usually refers to a tearing of the vessel wall during the stent procedure

Sedative: A substance or medication given to make you relax and feel sleepy

Seizure: A temporary sudden change in behavior due to abnormal electrical activity in the brain

Septicemia: The presence of bacteria in the blood, also known as bacteremia

Shunt: A small tube generally used to divert blood that flows through an artery

Stenosis: A build-up of fatty plaque material in the artery that causes narrowing of the artery and blocks or slows blood flow

Stent: A small mesh tube, generally metal, permanently implanted to keep a vessel open by giving support to the vessel wall

Stenting: The process of stent placement

Stent Implant Card: A card containing information about your stent and the stenting procedure

Stroke: A sudden interruption in the blood supply to part of your brain resulting in decreased oxygen and injury to your brain

Sutures: Stitches used by doctors to hold the artery together

Thrombus: A blood clot

Thrombosis: The process of blood clot or thrombus formation

TIA (Transient Ischemic Attack): A brief (temporary) interruption of the blood supply to part of your brain resulting in stroke symptoms; similar to a stroke but symptoms disappear in a short period of time (within 24 hours)

Titanium: Medical grade metal used with Nickel to make a Nitinol stent

Transfusion: Process of transferring blood from one person to another

Unilateral: Affecting only one side

Vascular Access Site: Site at which the doctor introduces the catheter into the artery, normally the groin or the arm

Vascular Closure Device: A device used to close the puncture in the artery in your groin when the endovascular procedure is completed to prevent bleeding and to contribute to reducing your recovery time

Vessel Recoil: An effect of the elastic properties of the vessel walls that results in loss of the vessel diameter (lumen) in which the vessel re-narrows, or recoils, to its original size

Vessel Spasm: Contraction of muscles in a vessel wall reducing the vessel thickness and thereby reducing blood flow

X-rays: Radiation used by health care providers to take images of the inside of your body

Questions and Reminders

Questions:

Procedure Date and Time:

Hospital: _____

Date: _____ Time: _____

Doctor: _____

Telephone Number: _____

Medications:

11 INDEX

CAUTION: Federal (USA) law restricts this device to sale by or on the order of a physician.

Additional information about Indications for Use, contraindications, warnings and precautions for the Exponent Carotid Stent System and the GuardWire®3-6 Temporary Occlusion & Aspiration System, can be found in the ***Instructions for Use*** for each product. You can obtain a copy by contacting the U.S. Customer Services at the number listed below.

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Additional information regarding Medtronic products can be found on the internet at: www.medtronic.com

UC200605676EN, Rev B