



WEB®

Aneurysm Embolization System
Instructions For Use

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DEVICE DESCRIPTION

The WEB Aneurysm Embolization System consists of an implantable embolization device attached to a delivery system. The delivery system is navigated through compatible neurovascular microcatheters to the aneurysm and is electro-thermally detached by the physician with a hand-held, battery-powered detachment controller device designed specifically for the WEB Aneurysm Embolization System. The WEB Detachment Controller (WDC) device is provided separately and is for single use only.

The WEB embolization device is manufactured from nitinol wires and nitinol wires with a platinum core in a braided, self-expanding mesh configuration. The WEB embolization device is provided in a broad range of sizes (diameters and lengths) and two different shapes (barrel and sphere) to satisfy the needs of the physician. During treatment, the physician selects the appropriate device size and shape based on the size, shape and location of the intracranial aneurysm to be occluded. The WEB embolization device is delivered to the treatment site on the delivery device through standard neuro-interventional wire-reinforced microcatheters with a specified minimum inner diameter (see Table 1 below). An introducer sheath on the outside of the delivery device assists in the placement of the system into the microcatheter.

INDICATIONS FOR USE

The WEB Aneurysm Embolization System is indicated for use at the middle cerebral artery (MCA) bifurcation, internal carotid artery (ICA) terminus, anterior communicating artery (AComm) complex, or basilar artery apex for the endovascular treatment of adult patients with saccular, wide neck bifurcation intracranial aneurysms with dome diameter from 3 mm to 10 mm and either neck size 4 mm or greater or the dome-to-neck ratio is greater than 1 and less than 2.

CONTRAINDICATIONS

- Patients with known active bacterial infection that may interfere with or negatively affect the implantation procedure.
- Patients with known hypersensitivity to nickel.

REQUIRED ADDITIONAL ITEMS

- Sequent Medical Inc. detachment control device
- Wire-reinforced microcatheter with distal tip RO marker (see Table 1)
- Guide catheter compatible with microcatheter
- Steerable guidewire compatible with microcatheter
- Two rotating hemostatic Y valves (RHV)
- One three-way stopcock
- One one-way stopcock
- Sterile saline
- Pressurized sterile saline drip

Table 1 – Microcatheter Sizes

Embolization Device (Diameter) Range	Minimum Microcatheter Inner Diameter (inch)	Recommended Microcatheter ¹
W4 – WEB Single 4 – 7 mm	0.021	VIA 21
W2 - WEB Single 8 – 9 mm	0.027	VIA 27
W2 - WEB Single 10 – 11 mm	0.033	VIA 33

¹ Use of a different catheter may result in extreme friction and damage to the device.

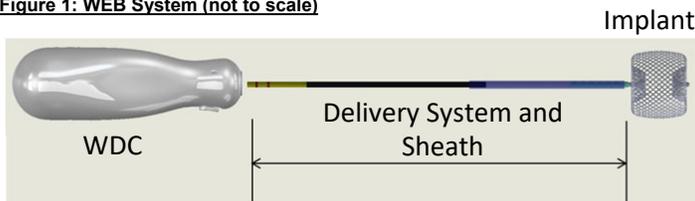
POTENTIAL COMPLICATIONS

Potential complications include but are not limited to the following: vessel puncture site hematoma, aneurysm perforation or rupture, hemorrhage, edema, thromboemboli, transient ischemic attack, ischemic stroke, neurologic deficits, parent artery occlusion, ischemia, vessel dissection or perforation, vascular thrombosis, vasospasm, device migration or misplacement, premature detachment, headache, post-embolization syndrome, infection and death.

The WEB embolization device requires the use of fluoroscopy. Potential complications related to angiographic and fluoroscopic radiation doses include, but are not limited to, alopecia, burns ranging in severity from skin reddening to ulcers, cataracts, and delayed neoplasia. The probability of occurrence of complications may increase as procedure time and number of procedures increase.

Other procedural complications including but not limited to anesthetic and contrast media risks, hypotension, hypertension and access site complications.

Figure 1: WEB System (not to scale)



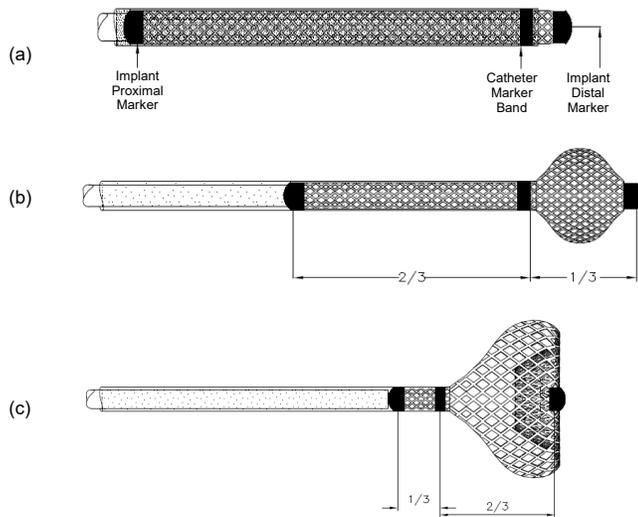
WARNINGS

- The WEB Aneurysm Embolization System (see Figure 1) is provided sterile and non-pyrogenic unless the unit package is opened or damaged.
- Do not use if the packaging is open or damaged. Use before expiration date noted on the product packaging.
- The WEB Aneurysm Embolization System is intended for single use only. The detachment control device is intended to be used for one patient.
- Do not resterilize and/or reuse the device. Reuse and/or reesterilization can increase risk of infection, cause a pyrogenic response or other life-threatening complications. Reuse and/or reesterilization can degrade product performance, leading to device malfunction. Dispose of all devices in accordance with applicable hospital, administrative and/or local government policy.
- The safety and effectiveness of the WEB device in areas other than those identified in the Indications for Use has not been established.
- The safety and effectiveness of the device has not been established for ruptured intracranial aneurysms.
- The safety and effectiveness of the device has not been evaluated or established in intracranial aneurysms that were previously treated.
- High quality, digital subtraction fluoroscopic road mapping, with orthogonal views is recommended to achieve correct placement of the WEB device.
- Do not allow an inappropriately sized or non-optimally positioned device to reside in the aneurysm significantly beyond the activated clotting time (ACT). Experience has shown that thrombus formation can also prevent the WEB from full deployment and recapture. To minimize the risks of potential complications, the status of the patient's anti-platelet medication regimen should be considered when deciding to remove the entire WEB implant from the aneurysm prior to deployment/detachment for replacement by a new device.
- Use of the WEB embolization device in anatomy with severe tortuosity, stenosis, or vessel narrowing may result in difficulty or inability to deploy the subject device and can lead to damage of the WEB device or microcatheter.
- The safety and effectiveness of the device has not been established for patients taking anticoagulants or who have a known blood dyscrasia, coagulopathy, or hemoglobinopathy.
- The WEB embolization device must be delivered only through a compatible microcatheter with a PTFE inner surface coating. If an incompatible microcatheter is used, damage to the WEB embolization device and delivery device may occur and necessitate removal of both the device and microcatheter from the patient.
- Advance and retract the device slowly. Do not advance the delivery device with excessive force. Determine the cause of any unusual resistance. Remove the device if excessive friction is noted and check for damage.
- Do not rotate the delivery device during or after delivery of the embolization device. Rotating the device may result in damage or premature detachment.
- The WEB embolization device cannot be detached with any other power source other than a WEB detachment control device. Ensure that at least two WEB detachment control devices are available before initiating an embolization procedure.

PRECAUTIONS

- General Precaution: Large bore microcatheters may have a higher probability of developing a thromboembolic event in the parent vessel.
- The WEB embolization device should be used only by physicians trained in percutaneous, intravascular, and neurovascular techniques and procedures at medical facilities with the appropriate fluoroscopic equipment.
- The WEB embolization device should be used by physicians who have received appropriate training for this device.
- Carefully weigh the benefits of treatment vs. the risks associated with treatment using the device for each individual patient based on their medical health status and risks factors for intracranial aneurysm rupture during their expected life time such as age, medical comorbidities, history of smoking, intracranial aneurysm size, location, and morphology, family history, history of prior asymptomatic subarachnoid hemorrhage (aSAH), documented growth of intracranial aneurysm on serial imaging, presence of multiple intracranial aneurysms, and presence of concurrent pathology. The benefits of device use may not outweigh the risks associated with the device in certain patients; therefore, judicious patient selection is recommended.
- Limit the exposure to X-ray radiation doses to patients and physicians by using sufficient shielding, reducing fluoroscopy times, and modifying X-ray technical factors when possible.
- The WEB device may create local field inhomogeneity and susceptibility artifacts during magnetic resonance angiography (MRA), which may degrade the diagnostic quality to assess effective intracranial aneurysm treatment. Please only use digital subtraction angiography (DSA) or computed tomography angiography (CTA) to assess intracranial aneurysm occlusion for patient follow-up.
- Steam shaping 0.021" and greater microcatheters may result in improper WEB delivery and deployment, depending on the degree of shaping and catheter deflection during WEB delivery.

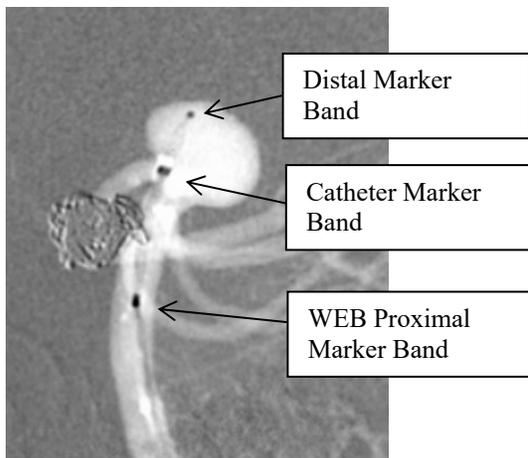
- If repositioning is required, take special care to retract or to advance the device under fluoroscopy, including new road map to confirm catheter position.
- If the embolization device must be retrieved from the vasculature after detachment, retrieval devices (e.g. alligator and snare) should be used per their manufacturer's instructions.
- The pictures in (a) through (c) below illustrate WEB deployment. Initially, the distal implant marker band exits the microcatheter (a). As the implant is advanced, it begins to expand in diameter (b). When the distance between the catheter marker band and implant tip is about 1/3 of the total implant marker distance, the implant diameter is generally about 1/2 of its fully deployed diameter (b). When the implant distal marker band to catheter distal marker band distance is about 2/3 of the total implant marker-marker distance, the implant has reached about 4/5 of its fully deployed diameter and the distal marker band begins moving into the distal recess (c).



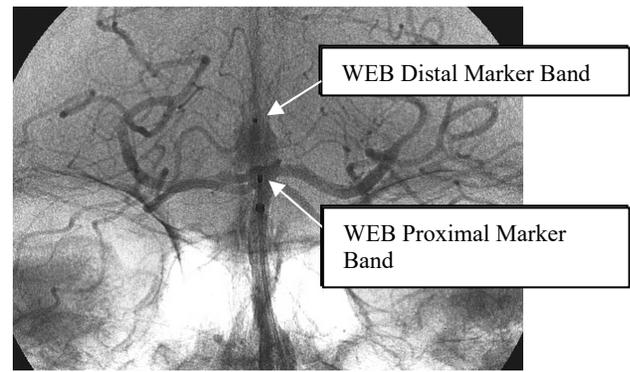
- The WEB foreshortens during delivery (~60%) (e.g. see **Figure 2a**, a 11mm x 9mm device will measure ~20mm in length when contained within a 0.032"-0.038" delivery microcatheter).
- When properly deployed, two radio-opaque markers should be separated and fluoroscopically visible (e.g. see **Figure 2b**, depending on working projection and placement in the aneurysm, the distance between the proximal to distal marker should approximate the labeled WEB length).
- WEB visibility may vary with diameter; larger sizes may be more visible than smaller sizes. Examples are shown in **Figure 2c**.

Figure 2: WEB in catheter partially deployed foreshortened (a) and properly fully deployed (b)

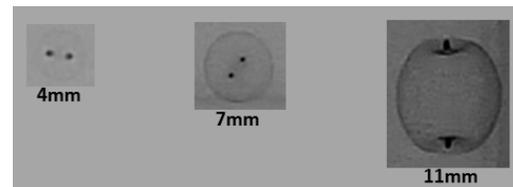
(a) WEB partially in catheter, partially deployed in aneurysm – foreshortened view



(b) WEB fully deployed in aneurysm



(c) WEB Visibility



- If the radio-opaque markers are clustered (i.e. a shorter distance between markers than expected), retract WEB into the microcatheter and evaluate the microcatheter/aneurysm position with multiple fluoroscopic angles.
- Batteries are pre-loaded into the WEB detachment control device. Do not attempt to remove or replace the batteries.

SUMMARY OF ADVERSE EVENTS IN CLINICAL STUDY

There were 348 adverse events which occurred in the 150 subjects in which treatment was attempted in the WEB-IT study through 12 months. Two hundred eighty-six (286) were non-serious adverse events (AEs) occurring in 104 subjects and 62 were serious AEs (SAEs) occurring in 33 subjects. No deaths occurred in the study through the 12-month primary endpoint follow up period. There were 15 events that were adjudicated to be serious and related to the investigational device or procedure.

Overall Adverse Event Summary (independent of relatedness)

Adverse Event	Within 30 days			Within 31 - 365 days		
	# of Events	# of subjects with the event	% of subjects with event	# of Events	# of subjects with the event	% of subjects with event
Blood and lymphatic system disorders						
Anemia	1	1	0.67%	1	1	0.67%
Cardiac disorders						
Angina pectoris	2	1	0.67%	5	1	0.67%
Arrhythmia	2	2	1.33%	1	1	0.67%
Cardiac arrest	0	0	0.00%	1	1	0.67%
Cardiac valve disease	0	0	0.00%	1	1	0.67%
Coronary artery disease	1	1	0.67%	1	1	0.67%
Ear and labyrinth disorders						
Ear pain	0	0	0.00%	1	1	0.67%
Tinnitus	1	1	0.67%	0	0	0.00%
Vertigo	0	0	0.00%	2	1	0.67%
Endocrine disorders						
Cushing's syndrome	0	0	0.00%	2	1	0.67%
Eye disorders						
Diplopia	1	1	0.67%	0	0	0.00%
Visual impairment	4	4	2.67%	4	4	2.67%
Vitreous detachment	1	1	0.67%	0	0	0.00%
Gastrointestinal disorders						
Abdominal pain	3	3	2.00%	2	1	0.67%
Constipation	1	1	0.67%	1	1	0.67%
Crohn's disease	0	0	0.00%	1	1	0.67%
Diarrhea	0	0	0.00%	2	1	0.67%
Enteritis	0	0	0.00%	1	1	0.67%
Gastric ulcer	0	0	0.00%	1	1	0.67%
Gastrointestinal hemorrhage	0	0	0.00%	2	2	1.33%
Gastroesophageal reflux disease	1	1	0.67%	0	0	0.00%
Impaired gastric emptying	0	0	0.00%	1	1	0.67%
Nausea	10	9	6.00%	1	1	0.67%
Esophageal spasm	0	0	0.00%	1	1	0.67%
Pancreatitis	0	0	0.00%	1	1	0.67%

Adverse Event	Within 30 days			Within 31 - 365 days		
	# of Events	# of subjects with the event	% of subjects with event	# of Events	# of subjects with the event	% of subjects with event
Vomiting	3	3	2.00%	0	0	0.00%
General disorders and administration site conditions						
Adverse drug reaction	8	7	4.67%	7	7	4.67%
Application site hemorrhage	0	0	0.00%	1	1	0.67%
Chest discomfort	2	2	1.33%	0	0	0.00%
Chest pain	1	1	0.67%	1	1	0.67%
Fatigue	1	1	0.67%	1	1	0.67%
Influenza like illness	1	1	0.67%	0	0	0.00%
Edema	0	0	0.00%	1	1	0.67%
Edema peripheral	0	0	0.00%	1	1	0.67%
Puncture site reaction	1	1	0.67%	0	0	0.00%
Pyrexia	0	0	0.00%	1	1	0.67%
Vessel puncture site bruise	2	2	1.33%	0	0	0.00%
Vessel puncture site hematoma	7	7	4.67%	5	5	3.33%
Vessel puncture site hemorrhage	1	1	0.67%	0	0	0.00%
Vessel puncture site pain	5	5	3.33%	1	1	0.67%
Hepatobiliary disorders						
Cholelithiasis	0	0	0.00%	1	1	0.67%
Infections and infestations						
Cellulitis	0	0	0.00%	1	1	0.67%
Cytomegalovirus infection	0	0	0.00%	1	1	0.67%
Diverticulitis	0	0	0.00%	1	1	0.67%
Laryngitis	1	1	0.67%	1	1	0.67%
Oral herpes	0	0	0.00%	1	1	0.67%
Otitis media	0	0	0.00%	1	1	0.67%
Pneumonia	0	0	0.00%	2	2	1.33%
Respiratory tract infection	1	1	0.67%	1	1	0.67%
Sinusitis	0	0	0.00%	1	1	0.67%
Staphylococcal skin infection	0	0	0.00%	1	1	0.67%
Tooth infection	0	0	0.00%	2	2	1.33%
Urinary tract infection	1	1	0.67%	4	3	2.00%
Viral infection	0	0	0.00%	2	2	1.33%
Injury, poisoning and procedural complications						
Animal bite	0	0	0.00%	1	1	0.67%
Arterial injury	1	1	0.67%	0	0	0.00%
Contusion	1	1	0.67%	1	1	0.67%
Fracture	0	0	0.00%	1	1	0.67%
Head injury	0	0	0.00%	1	1	0.67%
Laceration	0	0	0.00%	1	1	0.67%
Lower limb fracture	0	0	0.00%	1	1	0.67%
Traumatic hematoma	1	1	0.67%	0	0	0.00%
Vascular pseudoaneurysm	1	1	0.67%	0	0	0.00%
Investigations						
Blood creatinine increased	0	0	0.00%	1	1	0.67%
Blood pressure decreased	0	0	0.00%	1	1	0.67%
Blood pressure increased	3	3	2.00%	2	2	1.33%
Metabolism and nutrition disorders						
Diabetes mellitus	0	0	0.00%	1	1	0.67%
Electrolyte imbalance	3	2	1.33%	3	3	2.00%
Hyperlipidemia	0	0	0.00%	1	1	0.67%
Hypocalcemia	0	0	0.00%	1	1	0.67%
Musculoskeletal and connective tissue disorders						
Arthralgia	2	2	1.33%	1	1	0.67%
Arthritis	0	0	0.00%	3	3	2.00%
Back pain	3	3	2.00%	4	4	2.67%
Lumbar spinal stenosis	1	1	0.67%	0	0	0.00%
Muscle spasms	0	0	0.00%	1	1	0.67%
Muscular weakness	1	1	0.67%	0	0	0.00%
Neck pain	2	2	1.33%	3	3	2.00%
Pain in extremity	4	4	2.67%	0	0	0.00%
Palmar fasciitis	0	0	0.00%	1	1	0.67%
Neoplasms benign, malignant and unspecified (incl cysts and polyps)						
Meningioma	0	0	0.00%	1	1	0.67%
Paranasal sinus neoplasm	0	0	0.00%	1	1	0.67%
Uterine leiomyoma	1	1	0.67%	1	1	0.67%
Nervous system disorders						
Aphasia	1	1	0.67%	1	1	0.67%
Ataxia	1	1	0.67%	0	0	0.00%
Benign intracranial hypertension	0	0	0.00%	1	1	0.67%
Carotid artery dissection	1	1	0.67%	0	0	0.00%

Adverse Event	Within 30 days			Within 31 - 365 days		
	# of Events	# of subjects with the event	% of subjects with event	# of Events	# of subjects with the event	% of subjects with event
Carpal tunnel syndrome	0	0	0.00%	1	1	0.67%
Cerebrovascular disorder	0	0	0.00%	1	1	0.67%
Dementia	0	0	0.00%	1	1	0.67%
Dizziness	1	1	0.67%	1	1	0.67%
Dizziness postural	1	1	0.67%	0	0	0.00%
Gait disturbance	0	0	0.00%	1	1	0.67%
Hemorrhage intracranial	0	0	0.00%	1	1	0.67%
Headache	21	20	13.33%	25	21	14.00%
Hypoesthesia	1	1	0.67%	0	0	0.00%
Ischemic stroke	7	7	4.67%	3	3	2.00%
Memory impairment	0	0	0.00%	1	1	0.67%
Migraine	2	2	1.33%	2	2	1.33%
Nystagmus	1	1	0.67%	0	0	0.00%
Paresthesia	1	1	0.67%	0	0	0.00%
Restless legs syndrome	0	0	0.00%	1	1	0.67%
Sciatica	0	0	0.00%	1	1	0.67%
Seizure	1	1	0.67%	1	1	0.67%
Sensory loss	0	0	0.00%	2	2	1.33%
Subarachnoid hemorrhage	3	3	2.00%	0	0	0.00%
Syncope	1	1	0.67%	0	0	0.00%
Transient ischemic attack	5	4	2.67%	5	4	2.67%
Psychiatric disorders						
Alcohol abuse	1	1	0.67%	0	0	0.00%
Anxiety	0	0	0.00%	3	3	2.00%
Confusional state	1	1	0.67%	0	0	0.00%
Depression	0	0	0.00%	4	4	2.67%
Insomnia	0	0	0.00%	2	2	1.33%
Renal and urinary disorders						
Calculus ureteric	0	0	0.00%	1	1	0.67%
Nephrolithiasis	0	0	0.00%	1	1	0.67%
Urinary incontinence	1	1	0.67%	0	0	0.00%
Urinary retention	2	2	1.33%	0	0	0.00%
Reproductive system and breast disorders						
Benign prostatic hyperplasia	0	0	0.00%	1	1	0.67%
Postmenopausal hemorrhage	1	1	0.67%	0	0	0.00%
Respiratory, thoracic and mediastinal disorders						
Cough	1	1	0.67%	0	0	0.00%
Dyspnea	1	1	0.67%	1	1	0.67%
Hypoxia	0	0	0.00%	1	1	0.67%
Pulmonary embolism	1	1	0.67%	1	1	0.67%
Respiratory failure	0	0	0.00%	1	1	0.67%
Rhinitis allergic	0	0	0.00%	1	1	0.67%
Tracheal stenosis	0	0	0.00%	1	1	0.67%
Skin and subcutaneous tissue disorders						
Alopecia	1	1	0.67%	0	0	0.00%
Dermatitis	0	0	0.00%	1	1	0.67%
Dermatosis	1	1	0.67%	0	0	0.00%
Surgical and medical procedures						
Aneurysm repair	0	0	0.00%	1	1	0.67%
Eye operation	0	0	0.00%	1	1	0.67%
Intra-cerebral aneurysm operation	0	0	0.00%	1	1	0.67%
Vascular disorders						
Aortic aneurysm	0	0	0.00%	1	1	0.67%
Arterial spasm	1	1	0.67%	0	0	0.00%
Arterial thrombosis	3	3	2.00%	0	0	0.00%
Femoral artery dissection	1	1	0.67%	0	0	0.00%
Hypertension	3	3	2.00%	7	3	2.00%
Hypotension	1	1	0.67%	1	1	0.67%
Labile blood pressure	1	1	0.67%	0	0	0.00%
Phlebitis	0	0	0.00%	1	1	0.67%
Thrombophlebitis	1	1	0.67%	0	0	0.00%
Vascular occlusion	0	0	0.00%	1	1	0.67%
Vasospasm	5	5	3.33%	0	0	0.00%

Device-Related Serious Adverse Events^{a,b}

Preferred Term	Event Rate x/n (%)
Subarachnoid hemorrhage	1/150 (0.67)

^aProbably or definitely related to device.

^bThere were no device-related SAE beyond 30 days

Joint Device- and Procedure-Related^a Serious Adverse Events^{a,b}

Preferred Term	Event Rate x/n (%)
Ischemic Stroke	1/150 (0.67)
Transient ischemic attack	1/150 (0.67)
Arterial thrombosis	1/150 (0.67)

^aProbably or definitely related to device.

^bThere were no device-related SAE beyond 30 days

Serious Procedure Related Adverse Events^{a,b}

Preferred Term	Event Rate x/n (%)
Vomiting	1/150 (0.67)
Vessel puncture site hematoma	3/150 (2.00)
Aphasia	1/150 (0.67)
Ischemic Stroke	3/150 (2.00)
Subarachnoid hemorrhage	1/150 (0.67)
Transient ischemic attack	1/150 (0.67)
Confusional state	1/150 (0.67)

^aProbably or definitely related to device.

^bThere were no device-related SAE beyond 30 days

Summary of Clinical Study

Design:

The WEB-IT Study was a prospective, multicenter, single-arm, interventional study which enrolled 179 patients that signed the informed consent form and 150 patients in which treatment was attempted (modified intent-to-treat (mITT) population) at 21 US and 6 international centers.

Inclusion Criteria

- Patient must be 18-75 years of age at time of screening;
- Patient must have a single intracranial aneurysm requiring treatment. If the subject has an additional aneurysm requiring treatment, the additional aneurysm must **not** require treatment within 60 days of the index procedure
- Aneurysm to be treated must have the following characteristics:
 - Saccular in shape
 - Located in basilar artery apex (BA), middle cerebral artery (MCA) bifurcation, internal carotid artery (ICA) terminus, anterior communicating artery (AComm)
 - Dome-to-Neck (DN) ratio ≥ 1
 - Diameter of the IA appropriate for treatment with the WEB Aneurysm Embolization System per device Instructions for Use
 - Wide-neck IA with neck size ≥ 4 mm or Dome-to-Neck (DN) < 2 ;
- Patient had an IA that was appropriate for treatment with WEB without the use of additional implanted devices;
- If the IA previously ruptured, patient must be neurologically stable with Hunt & Hess Score of I or II.
- Patient was able to comply with all aspects of the screening, evaluation, treatment, and the post-procedure follow-up schedule.
- Patient signed and dated an Institutional Review Board or Ethics Committee - approved written informed consent prior to initiation of any study procedures

Exclusion Criteria

- Patient had an IA with characteristics unsuitable for endovascular treatment;
- Microcatheter did not reach patient's index aneurysm to allow necessary access to treat with study device.
- Patient had vessel characteristics, tortuosity or morphology which precluded safe access and support during treatment with study device;
- Patient had vascular disease or other vascular anomaly that precluded the necessary access to the aneurysm for use of the study device.
- Patient had clinical, angiographic or CT evidence of vasospasm, vasculitis, an intracranial tumor (except small meningioma) or any other intracranial vascular malformations on presentation;
- Patient had conditions placing them at high risk for ischemic stroke or had exhibited ischemic symptoms such as transient ischemic attacks, minor strokes, or stroke-in-evolution within the prior 60 days;
- Patient had any circulatory, neurovascular, cardiovascular, or neurologic conditions that resulted in unstable neurological symptoms
- Patient had mRS ≥ 2 prior to presentation or rupture (as applicable);
- Patient had an SAH from a non-index aneurysm or any other intracranial hemorrhage within 90 days;
- Patient had physical, neurologic or psychiatric conditions which precluded his/her ability to comply with all aspects of the screening, evaluation, treatment, and the post-procedure follow-up schedule;

- Patient's index IA was previously treated;
- Patient was taking anticoagulants or had a known blood dyscrasia, coagulopathy, or hemoglobinopathy;
- Patient was pregnant;
- Patient had known hypersensitivity, which could not be medically treated, to any component of the study device, procedural materials, or medications commonly used during the procedure;
- Patient was concurrently involved in another investigational study or a postmarket study that could affect the safety and effectiveness of IA treatment with the study device or with the study's follow-up schedule;
- Patient had an acute life-threatening illness other than the neurological disease to be treated in this trial;
- Patient had a life expectancy of less than 5 years due to other illness or condition (in addition to an intracranial aneurysm)

Demographics:

The demographics of the mITT population is shown below. The mean age was at treatment was 59 years (range 29 to 79 years). The demographic characteristics are consistent with a typical cohort of subjects undergoing treatment of intracranial aneurysms.

Characteristic	x/n (%)
Gender (Male)	40/150 (26.67)
Race ^a	
Asian	4/116 (3.45)
Black or African American	14/116 (12.07)
White	98/116 (84.48)
Ethnicity ^a	
Hispanic or Latino	2/116 (1.72)
Not Hispanic or Latino	114/116 (98.28)
Prior Rupture	9/150 (6.00)
Hunt and Hess	
I	6/9 (66.67)
II	3/9 (33.33)
mRS (unruptured)	
0	114/141 (80.85)
1	27/141 (19.15)
NIH Score at Baseline	
0	135/150 (90.00)
1	11/150 (7.33)
2	2/150 (1.33)
5	1/150 (0.67)
6	1/150 (0.67)
Aneurysm Location	
AComm	40/150 (26.67)
Basilar	59/150 (39.33)
ICA	6/150 (4.00)
MCA	45/150 (30.00)

^aRace and Ethnicity were not obtained for subjects from the European and Canadian sites.

Primary Safety Results

The major stroke and death rate, the primary safety outcome, at one year in WEB-IT is less than 1%. The rate for all strokes and neurological deaths at one year is 8% (12/150).

The pre-specified primary safety endpoint was defined as the proportion of subjects with death of any nonaccidental cause or any major stroke (defined as an ischemic or hemorrhagic stroke resulting in an increase of 4 points or more on the National Institutes of Health Stroke Scale and which remains present after 7 days) within the first 30 days after treatment or major ipsilateral stroke or death due to neurologic cause from day 31 to 365 after treatment. One patient (1/150, 0.67%) sustained a primary safety event in the mITT population. The success criterion of pre-established safety Performance Goal (PG) for the primary safety endpoint was achieved. The components of the primary safety endpoint in the completed cases (CC) population is presented below. The CC population does not include 3 subjects from the mITT population (N=150) who had missing 12-month follow-up safety data. Two subjects did not have a WEB device implanted and 1 subject withdrew before the 1-year follow-up visit.

Completed Cases Population (Safety N=147)

Endpoint	Rate
Composite	1/147 (0.68)
Death within 30 days	0/147 (0.68)
Major Stroke within 30 days	1/147 (0.68)
Major Ipsilateral Stroke Days 31 to 365	0/147 (0.00)
Neurological Death Days 31 to 365	0/147 (0.00)

Primary Effectiveness Results

Using imputation for 14 patients with missing outcome data, approximately 55% of the 150 patients are estimated to have had complete occlusion of the aneurysm with less than 50% stenosis of the parent artery after 1 year without retreatment and recurrent SAH; 18 subjects (12%) showed recanalization or regrowth of the aneurysm at 1 year. For the 150 subjects, 211 device placement attempts resulted in 148 device placements (148/211 = 70%).

The primary effectiveness endpoint was defined as the proportion of subjects with complete aneurysm occlusion assessed using the WEB Occlusion Scale (WOS) without retreatment, recurrent subarachnoid hemorrhage, without significant parent artery stenosis (>50% stenosis) at one year after treatment in the mITT population. In this study, 54.77% of the subjects in the mITT population met the success criteria based on combined analysis of the 20 completed imputations for missing subjects. The significance level for the one-sided hypothesis test that the primary effectiveness endpoint event rate is greater than 35% (the pre-established PG) is $p < 0.0001$ demonstrating the success criterion for the primary effectiveness endpoint was met.

In the completed cases population (N=143) defined as subjects with available DSA imaging data of the treated aneurysm and parent artery stenosis read by a Core Lab, the primary effectiveness endpoint success rate was 53.85% (77/143) with a lower bound for the two sided unadjusted 90% CI of 46.63%.

The components of the primary effectiveness endpoint in the completed cases (CC) population is presented below.

Completed Cases Population (Effectiveness n=143)

Component	Number of Subjects x/n (%)
Primary Endpoint Success	77/143 (53.85)
With imaging without imputation in CC	136/143 (95.10)
Imputed as failure for CC	7/143 (4.90)
Aneurysm Occlusion	
Complete	77 ^b /143 (53.85)
Residual Neck	44/143 (30.77)
Residual Aneurysm	15/143 (15.38)
Imputed as Failure for Primary Effectiveness	7/143 (4.90)
Parent Vessel Stenosis	
None	128 ^c /143 (89.51)
≤ 50%	7 ^d /143 (4.90)
> 50%	1/143 (0.70)
Imputed as Failure for Primary Effectiveness	7/143 (4.90)
Adjunctive Device (Imputed as failure)	2/143 (1.40)
Failure to Implant (Imputed as failure)	2/143 (1.40)
Retreatment of index aneurysm ^e (Imputed as failure)	3/143 (2.10)
Recurrent Subarachnoid Hemorrhage	0/143 (0.00)

^aThere were 8 subjects who had retreatment but 5 of those were failures on the 12-month angiogram, so these subjects were counted under their angiogram events. For the 3 subjects in this row, 1 had a 12-month result that was a complete occlusion and 2 did not have a 12-month outcome recorded.

^bThere were 81 subjects with complete occlusion at 12 months but 4 must be deleted because of retreatment, adjunct stent use during the procedure, or missing 12-month parent vessel score.

^cThere were 130 subjects with no parent vessel incursion but 2 of them had adjunct stent use during the procedure.

^dThere were 8 subjects with parent vessel stenosis of less than or equal to 50% but one was a subject scheduled at 12 months for retreatment.

Conclusion

Analyzed clinical data from the WEB-IT pivotal clinical study provided valid scientific evidence of the safety and effectiveness of the WEB Aneurysm Embolization System for the indicated population. The benefits of the WEB device outweigh the risks for the indicated population.

PROCEDURE - INSTRUCTIONS FOR USE

Catheterization of the Lesion

- Using standard interventional procedures, access the vessel with a guide catheter. The guide catheter should have an inner diameter large enough to allow for contrast injection while the microcatheter is in place.
- Attach a rotating hemostatic valve (RHV) to the hub of the guide catheter. Attach a three-way stopcock to the side arm of the RHV and then connect a line for continuous infusion of flush solution.
- Select a microcatheter with the appropriate inner diameter (see Table 1).
- After the microcatheter has been positioned inside the lesion, remove the guidewire.
- Attach a second RHV to the hub of the microcatheter. Attach a one-way stopcock to the sidearm of the second RHV and connect the flush solution line to the stopcock.
- Open the stopcock to allow flush through the microcatheter with sterile flush solution.

Device Size Selection

- The WEB implant should be deployed using device diameter over-sizing relative to the diameter of the target lesion. See the "Warnings" section for additional information for the safe deployment of the WEB device.
- Understand the aneurysm shape, width and height by performing 2D-angiographic fluoroscopy in two orthogonal projections.

- Measure the aneurysm necks, diameters, and heights of the aneurysm in each projection.
- Select the WEB SL or SLS shape by determining the average aneurysm diameter-to-average aneurysm neck ratio (in general, SL shape fits 1-to-1 thru 1.5-to-1 ratio aneurysms and the SLS shape fits 1.5-to-1 to 2-to-1 ratio aneurysms).
- Choose the appropriate WEB device using the average width and smallest height measurements.
- The correct WEB size is approximately 1 mm larger than the average aneurysm diameter and approximately 1 mm smaller than the smallest aneurysm height

Preparation of the Device for Delivery

- Remove the detachment control device from its protective packaging and place it within the sterile field. Do not use any power source from another medical device manufacturer to detach the embolization device.
- Remove the delivery device from the packaging hoop by pulling the proximal end until the introducer exits the hoop.
- Slowly advance the embolization device out of the introducer sheath and inspect for any damage. Do not use the device if there is any damage.
- Firmly insert the proximal end of the delivery device into the distal end of the detachment control device. Do not press the detachment button. If the light flashes green and the device beeps, the detachment control device is good to use. If not, replace the detachment control device and repeat this step with a new detachment control device. If the light flashes green and beeps with this second controller, proceed to the next step. Otherwise, obtain a new WEB delivery system.
- While holding the introducer sheath vertically, gently retract the embolization device back into the introducer sheath.

Introduction and Deployment of the Device

- Open the RHV on the microcatheter to accept the introducer sheath.
- Insert the introducer sheath through the RHV. Seat the distal tip of the introducer sheath at the distal end of the microcatheter hub and close the RHV lightly around the introducer to secure the RHV to the introducer. Do not over-tighten the RHV. Only insert the introducer into the microcatheter hub until a slight resistance is felt. Do not over insert.
- Push the device into the lumen of the microcatheter. Use caution to avoid catching the embolization device on the junction between the introducer sheath and hub of the microcatheter.
- Push the device through the microcatheter until the proximal end of the delivery device meets the proximal end of the introducer sheath.
- Loosen the RHV.
- Retract the introducer sheath just out of the RHV.
- Close the RHV around the delivery device.
- Slide the introducer sheath completely off the delivery device using care not to kink or damage the delivery system.
- Carefully advance the device until the distal end of the device reaches the last marker on the microcatheter.
- Reposition the tip of the microcatheter so that it sits just at the neck of the aneurysm. Do not insert the microcatheter completely inside the aneurysm.
- Under fluoroscopic guidance, slowly advance the embolization device out the tip of the microcatheter. Continue to advance the embolization device into the lesion until optimal deployment is achieved. The following may require repositioning or removal of the embolization device and/or repositioning of the microcatheter.
 - If the embolization device size is not appropriate, remove and replace with another device.
 - If undesirable movement of the embolization device is noted following placement and prior to detachment, remove the device. Movement of the embolization device may indicate that the device could migrate once it is detached.
 - If the embolization device (implant) does not fully open:
 - Retrieve the implant, reposition the microcatheter further proximally and re-deploy the implant to allow more room for expansion, or
 - Replace the implant with another implant of the same or alternate size.

The embolization device should not be retracted and deployed more than twice. After two attempts, remove the embolization device and replace with another device of the same or alternate size. To minimize the potential risk of thrombus, **DO NOT** allow an inappropriately sized or non-optimally positioned device to reside in the aneurysm significantly beyond the activated clotting time (ACT). Experience has shown that thrombus can also prevent the WEB from full deployment and recapture. To minimize the risks of potential complications, the status of the patient's anti-platelet medication regimen should be considered when making a decision to remove the entire system from the aneurysm for replacement by a new device.

- Angiographic assessment should always be performed prior to detachment to ensure that the embolization device is not markedly protruding into the parent vessel.
- The WEB should be placed with the proximal surface (center of proximal marker) aligned with the aneurysm neck and the proximal marker extending beyond the neck.
- If redeploying, retract device so that there is no contact with the aneurysm before attempting redeployment.
- Tighten the RHV to prevent movement of the embolization device.

33. Verify that the distal portion of the delivery device is not under tension or compression prior to detachment. This could cause the microcatheter tip to move resulting in aneurysm or vessel rupture.

Detachment of the Device

34. The detachment control device is pre-loaded with batteries and will activate when the delivery device is properly connected.
35. Verify that the RHV is firmly locked around the delivery device before attaching the detachment control device to ensure that the embolization device does not move during the connection process.
36. Ensure that the delivery device gold connectors are clean and free from blood or contrast. If necessary, wipe the connectors with sterile water and dry before connecting.
37. Insert the proximal end of the delivery device into the detachment control device. When the delivery device is properly connected, the light will flash green and an intermittent tone will be heard.
38. Verify the embolization device position before pressing the detachment button.
39. Push the detachment button. During firing, the light should be solid green and the beep should be continuous.
40. Verify detachment by first loosening the RHV valve, then pulling back slowly on the delivery device and verifying that there is not embolization device movement. If the embolization device does not detach, push the detachment button again. If the device is still not detached, obtain a new detachment control device and attempt detachment up to two additional times. If it does not detach, remove the delivery device.
41. Verify the position of the embolization device angiographically through the guide catheter.
42. Prior to removing the microcatheter from the treatment site, place an appropriately sized guidewire completely through the microcatheter lumen to ensure that no part of the embolization device remains within the microcatheter.

The physician has the discretion to modify the device deployment technique based on the complexity and variation in embolization procedures. Any modifications must be consistent with the previously described procedures, warnings, precautions and patient safety information in these instructions for use.

SPECIFICATIONS FOR DETACHMENT CONTROL DEVICE

- Model number: FGA00175
- Output voltage: 11.2-11.8 VDC
- Input Voltage: 24 VDC
- Batteries: 4 each A23
-  Type of applied part: BF
- Equipment not suitable for use in the presence of flammable mixtures
-  The detachment control device is a single use device, preloaded with batteries and packaged sterile. No cleaning, inspection or maintenance is required.
-  The detachment control device should not be cleaned, re-sterilized or re-used.
- Batteries are pre-loaded in the detachment control device. Do not attempt to remove or replace the batteries prior to use.
- If the detachment control device does not perform as described in the Detachment section of these instructions for use, discard the detachment control device and replace it with a new unit.

PACKAGING, STERILIZATION, STORAGE AND OPERATING CONDITIONS

The embolization and delivery device are placed inside a protective dispenser hoop and packaged in a pouch and unit carton. The detachment control device is packaged separately in a protective pouch and unit carton. The devices will remain sterile unless the package is opened, damaged or the expiration date has passed.

STERILE R The embolization device and delivery device are sterilized by gamma radiation. A small round indicator label has been affixed to the packaging of the embolization device and delivery device. This indicator turns from yellow to red upon exposure to radiation sterilization and must be red in order to use the device. If the indicator is yellow, do not use the device.

STERILE EO The detachment control device is sterilized by ethylene oxide. A small round indicator label has been affixed to the packaging of the detachment control device. This indicator turns from purple to green upon ethylene oxide sterilization and must be green in order to use the device. If the indicator is purple, do not use the device.

 Store at a controlled room temperature in a dry place.

The device should be used at a temperature of 20° – 23°C and a relative humidity of 30 – 60%. Atmospheric pressure variations do not impact device functionality.

MATERIALS

The WEB Aneurysm Embolization System is not made with natural rubber latex or PVC.

WARRANTY

Sequent Medical Inc. warrants that reasonable care has been used in the design and manufacture of this device. This warranty is in lieu of and excludes all other warranties not expressly set forth herein, whether expressed or implied by operation of law or otherwise, including, but not limited to, any implied warranties of merchantability or

fitness. Handling, storage, cleaning and sterilization of the device as well as factors relating to the patient, diagnosis, treatment, surgical procedures and other matters beyond Sequent Medical's control directly affect the device and this warranty is limited to the repair and replacement of this device. Sequent Medical Inc. shall not be liable for any incidental or consequential loss, damage or expense directly or indirectly arising from the use of this device. Sequent Medical Inc. neither assumes, nor authorizes any other person to assume or for it, any other or additional liability or responsibility in connection with this device. Sequent Medical, Inc. assumes no liability with respect to device reused, reprocessed or resterilized and makes no warranties, expressed or implied, including, but not limited to, merchantability or fitness for intended use, with respect to such device.

Prices, specification and model availability are subject to change without notice.

MRI SAFETY INFORMATION

MR Conditional

Non-clinical testing demonstrated that the WEB Aneurysm Embolization Device is MR Conditional. It can be scanned safely under the following conditions:

- Static magnetic field of 3-Tesla or less
- Maximum spatial gradient field of 4,000-Gauss/cm (40-T/m)
- Maximum MR system reported, whole body averaged specific absorption rate (SAR) of 2.0 W/kg for 15 minutes of scanning (i.e., per pulse sequence) in the Normal Operating Mode.

Under the scan conditions defined above, the WEB Aneurysm Embolization Device is expected to produce a maximum temperature rise of +1.4° C after 15 minutes of continuous scanning (i.e., per pulse sequence).

In non-clinical testing, the image artifact caused by the WEB Aneurysm Embolization Device extends approximately 5 mm from the implant when imaged with a gradient echo pulse sequence and a 3-Tesla MRI system.

The WEB device may create local field inhomogeneity and susceptibility artifacts during magnetic resonance angiography (MRA), which may degrade the diagnostic quality to assess effective intracranial aneurysm treatment. Please only use digital subtraction angiography (DSA) or computed tomography angiography (CTA) to assess intracranial aneurysm occlusion for patient follow-up.

SYMBOLS GLOSSARY

Symbol	Description	Applicable Standard and Reference Section
	Lot Number	ISO 15223-1 5.1.5
	Catalog Number	ISO 15223-1 5.1.6
	Sterilized Using Radiation	ISO 15223-1 5.2.4
	Sterilized Using Ethylene Oxide	ISO 15223-1 5.2.3
	Manufacturer	ISO 15223-1 5.1.1
	Do Not Reuse	ISO 15223-1 5.4.2
	Use By	ISO 15223-1 5.1.4
	Attention, see Instructions for Use	ISO 15223-1 5.4.4
	Do Not Resterilize	ISO 15223-1 5.2.6
	Do Not Use if Package is Damaged	ISO 15223-1 5.2.8
	Non-Pyrogenic	ISO 15223-1 5.6.3
	Keep Away from Heat/Sunlight	ISO 15223-1 5.3.2
	Keep Dry	ISO 15223-1 5.3.4
	MR Conditional	ASTM F2503 Table 2
Rx Only	Federal (USA) law restricts device to sale by or on the order of a physician	N/A

- FDA Consensus Standard 5-90: ISO 15223-1 (2016): Medical devices - Symbols to be used with medical device labels, labelling and information to be supplied - Part 1: General requirements
- FDA Consensus Standard 8-349: ASTM F2503-13: Standard Practice for Marking Medical Devices and Other Items for Safety in the Magnetic Resonance Environment

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Manufacturer:

Sequent Medical, Inc.
11A Columbia
Aliso Viejo, CA 92656 USA
www.sequentmedical.com
Tel: 949-830-9600
Fax: 949-830-9658