Medtronic AVE Bridge™ Extra Support

OVER-THE-WIRE RENAL STENT SYSTEM

INSTRUCTIONS FOR USE

Medtronic AVE Bridge™ Extra Support
OVER-THE-WIRE RENAL STENT SYSTEM

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

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1. DEVICE DESCRIPTION

The Medtronic AVE Bridge™ Extra Support Over-the-Wire Renal Stent System (referred as Bridge™ Extra Support) includes:

- A pre-mounted 316L stainless steel stent.
- A sheathless, over-the-wire renal stent system providing symmetrical stent deployment utilizing an extended pressure balloon.
- A delivery/deployment system comprised of a semi- compliant balloon material.
- Two radiopaque (Platinum/Iridium) markers embedded in the inner shaft beneath the balloon, proximal and distal to the stent. The markers are visible under fluoroscopy.

The Medtronic AVE Bridge™ Extra Support Over-the-Wire Renal Stent System can be re-inflated to the rated burst pressure (RBP), without moving the placement of the balloon within the stent, to optimize stent apposition.

Figure 1. Medtronic AVE Bridge ™ Extra Support Stent Graphic

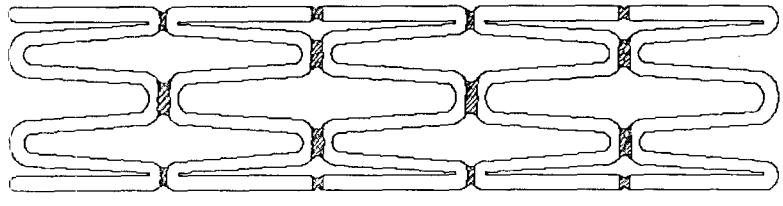


Table 1a. Device Sizes and Model Numbers

Bridge Extra Support Renal Stent System			
Model #	**Stent Diameter**	**Stent Length**	**Catheter Length**
XR510	5.0mm	10.0mm	75cm
XR510L	5.0mm	10.0mm	120cm
XR517	5.0mm	17.0mm	75cm
XR517L	5.0mm	17.0mm	120cm
XR610	6.0mm	10.0mm	75cm
XR610L	6.0mm	10.0mm	120cm
XR617	6.0mm	17.0mm	75cm
XR617L	6.0mm	17.0mm	120cm
XR710	7.0mm	10.0mm	75cm
XR710L	7.0mm	10.0mm	120cm
XR717	7.0mm	17.0mm	75cm
XR717L	7.0mm	17.0mm	120cm

Table 1b. Device Specifications

Stent Diameter	Stent Lengths Available*	Minimum Guiding Catheter Compatibility**	Sheath	Nominal Stent Deployment Pressure	Rated Burst Pressure (RBP)
5.0 mm	10 and 17 mm	0.086 in	7F	8 atm	12 atm
6.0 mm	10 and 17 mm	0.086 in	7F	8 atm	12 atm
7.0 mm	10 and 17 mm	0.086 in	7F	8 atm	12 atm

* Available in 75 cm or 120 cm delivery catheters.
** See manufacturer specifications for French (F) equivalent.

2. INDICATIONS

The Bridge Extra Support device is indicated for use in patients with atherosclerotic disease of the renal arteries following sub-optimal or failed percutaneous transluminal renal angioplasty (PTRA) of a de novo lesion (≤ 15 mm in length) located within 10 mm of the aortorenal border and with a reference vessel diameter of 5.0 to 7.0 mm. Sub-optimal or failed PTRA include any of the following: visible evidence of a residual stenosis ≥ 50% after optimal PTRA, visible evidence of intimal dissection > 6 mm, or peak systolic trans-stenotic gradient of ≥ 20 mmHg or a mean of ≥ 10 mmHg.

3. CONTRAINDICATIONS

There are no known contraindications for the Bridge™ Extra Support Renal Stent System.

4. WARNINGS AND PRECAUTIONS

(See also Individualization of Treatment)

- Long-term outcome (beyond one year) for this permanent implant is unknown at present.
- Judicious selection of patients is necessary since the use of this device carries the associated risk of sub-acute thrombosis, vascular complications and/or bleeding events.
- Patients allergic to 316L stainless steel may suffer an allergic reaction to this implant.
- Patients who may be incapable of discerning or describing pain may not be suitable for this implant.
- Patients in whom antiplatelet and/or anticoagulation therapy is contraindicated may not be suitable for this implant.
- Patients who are judged to have an ostial renal lesion that prevents complete inflation of an angioplasty balloon may not be suitable for this implant.

- The device should only be used by physicians who are trained in peripheral interventional techniques and have had previous experience in peripheral interventional treatment.

- Stent placement should only be performed at hospitals where emergency peripheral artery bypass graft surgery, including renal artery bypass graft surgery can be readily performed.

- Subsequent restenosis may require repeat dilatation of the arterial segment containing the stent. The long-term outcome following repeat dilatation of endothelialized renal stents is unknown at present.

- When multiple stents are required, it is recommended that stent materials should be of similar composition.

4.1 Stent Handling – Precautions

- **For single use only**. Do not resterilize or reuse. Note product "Use By" date.

- **Do not remove stent from the Stent Delivery System** as removal may damage the stent and/or lead to stent embolization. The Bridge™ Extra Support is intended to perform as a system. The Bridge™ Extra Support Stent is not designed to be crimped onto another delivery device.

- Stent Delivery System should not be used in conjunction with any other stents.

- Special care must be taken not to handle or in any way disrupt the stent position on the delivery device. This is most important during catheter removal from packaging, placement over guidewire, and advancement through rotating hemostasic valve adapter and guiding catheter hub.

- Excessive manipulation, e.g., rolling the mounted stent, may cause dislodgment of the stent from the delivery balloon.

- Use only the appropriate balloon inflation media. Do not use air or any gaseous medium to inflate the balloon as it may cause uneven expansion and difficulty in deployment of the stent.

4.2 Stent Placement – Precautions

- **Do not prepare or pre-inflate the Stent Delivery System prior to stent deployment**, other than as directed. Use balloon purging technique described in section 9.3.2 Delivery System Preparation.

- Implanting a stent may lead to dissection of the vessel distal and/or proximal to the stented portion, and may cause acute closure of the vessel requiring additional intervention (e.g., further dilatation, placement of additional stents, or other).

- Incomplete stent expansion or apposition may result in procedural complication or patient injury.

- When treating multiple lesions, the distal lesion should be initially stented, followed by stenting of the proximal lesion. Stenting in this order obviates the need to cross the proximal stent when placing the distal stent and reduces the chances for disrupting the proximal stent.

- Do not expand the stent if it is not properly positioned in the vessel (see Stent/System Removal – Precautions).

- **Do not exceed Rated Burst Pressure as indicated on product label.** Balloon pressures should be monitored during inflation (see Compliance Chart - Table 4). Use of pressures higher than those specified on product label may result in a ruptured balloon and potential intimal damage and dissection.

- **Do not attempt to pull an unexpanded stent back through the guiding catheter; dislodgment of the stent from the balloon may occur** (see Stent/System Removal- Precautions).

- Stent retrieval methods (use of additional wires, snares and/or forceps) may result in additional trauma to the renal vasculature and/or the vascular access site. Complications can include perforation, bleeding, hematoma or pseudoaneurysm.

- The Bridge™ Extra Support does not provide for distal contrast injections or pressure measurements through the guidewire lumen.

4.3 Stent / System Removal - Precautions

Should **unusual resistance** be felt **at any time**, either during lesion access or during removal of the Stent Delivery System post-stent implantation, the Stent Delivery System and the guiding catheter **should be removed as a single unit**. This must be done under direct visualization with fluoroscopy.

When removing the Stent Delivery System as a single unit:

- **Do not retract the Stent Delivery System into the guiding catheter.** Maintain guidewire placement across the lesion and carefully pull back the Stent Delivery System until the proximal balloon marker of the Stent Delivery System is aligned with the distal tip of the guiding catheter.

- The guiding catheter and the Stent Delivery System should be carefully removed from the renal artery as a single unit.

- The system should be pulled back into the descending aorta toward the arterial sheath. As the distal end of the guiding catheter enters into the arterial sheath, the catheter will straighten, allowing safe withdrawal of the Stent Delivery System into the guiding catheter and the subsequent removal of the Stent Delivery System and the guiding catheter from the arterial sheath.

- Failure to follow these steps and/or applying excessive force to the Stent Delivery System can potentially result in loss or damage to the stent and/or Stent Delivery System components such as the balloon.

4.4 Post-Implant– Precautions

- Care must be exercised when **crossing a newly deployed stent** with an intravascular ultrasound (IVUS) catheter, a guidewire, or a balloon catheter to avoid disrupting the stent geometry.

- Do not perform **Magnetic Resonance Imaging** (MRI) scans on patients post-stent implantation until the stent has been completely endothelialized (eight weeks post stent implant) to minimize the potential for migration. The stent may cause artifacts in MRI scans due to distortion of the magnetic field.

5. OBSERVED ADVERSE EVENTS

A total of 188 patients were enrolled in a twenty-six multi-center, non-randomized clinical registry to evaluate the safety and effectiveness of the balloon expandable, AVE Bridge™ Renal Stent System (Bridge™ Extra Support) for treatment of symptomatic renal artery disease due to aorto-ostial lesion following sub-optimal PTRA. All 188 patients received the Bridge™ Extra Support while participating in the SOAR (Sub-Optimal Renal Angioplasty Results) Clinical Trial. These patients form the basis of the observed events reported (see SOAR Clinical Trial). Total MACE at 9-12 months was 16.0% (29/181), this included five Deaths (5/181), 12 (12/181) Target Lesion/Vessel Revascularization (TLR/TLV), and 12 (12/181) Significant Embolic Events.

5.1 SOAR Clinical Trial

A total of 188 patients were enrolled in the SOAR Clinical Trial to evaluate the safety and effectiveness of the Bridge™ Extra Support. A total of 29 of 188 patients (15.4%) who received the Bridge™ Extra Support stent and have been evaluated experienced one or more major adverse clinical events (MACE) during the first 12 months of follow-up. MACE reported during the first 9 to 12 months is shown in Table 2d. A total of 5 of the 188 patients who received the Bridge™ Extra Support died during the SOAR clinical trial. No patient death occurred before hospital discharge. The 5 out-of-hospital deaths occurred between 15 days and 277 days after stenting and were due to myocardial infarction (n=1), coronary artery disease (n=1), intracranial bleed (n=1), head injury (n=1) and anoxic encephalopathy (n=1).

There was one incidence 0.5% (1/188) of acute closure that resolved without additional treatment and resulted in no acute MACE events with a patient who received the Bridge™ Extra Support stent. The incidence of vascular complications after stent placement was 3.2% (6/188) of the patients through 30 days after implantation. The rate for procedural bleeding requiring transfusion was 2.1% (4/188) of the patients as seen before discharge.

Initial delivery failure occurred in 2.1% (4/188) of the patients as follows: operator was unable to deliver first stent (n=4) and there were no failure to deliver subsequent assigned stents (n=0).

Table 2. Percentage of Adverse Events Up To 9 to 12 months

Table 2a. Percentage of Adverse Events Through Discharge
(Number of Events/Denominator)
All Patients in SOAR Trial:

Description of Event	% (# of events / total sample)
In-Hospital Complications	
MACE (Death, procedure-related Q-wave MI, target lesions/vessel revascularization, or significant embolic events)	0.5% (1/188)
Death	0.0% (0/188)
Procedure-related Q-wave MI	0.5% (1/188)
Target Lesion/Vessel Revascularization	0.0% (0/188)
Significant Embolic Events	0.0% (0/188)
Abrupt Closure	0.5% (1/188)
Subacute Closure	0.0% (0/188)
Major Bleeding Complications	2.1% (4/188)
Major Vascular Complications	2.1% (4/188)
Cerebrovascular Accident (CVA) (peri-procedural)	0.0% (0/188)
Stent Delivery Failure	2.1% (4/188)

Table 2b. Percentage of Adverse Events Up To 30 days
(Number of Events/Denominator of evaluable patients)

Out of Hospital Complications (to 30 days)	% (# of events / total evaluable sample)[1]
MACE (Death, procedure-related Q-wave MI, target lesions/vessel revascularization, or significant embolic events)	2.7% (5/185)
Death	0.5% (1/185)
Procedure-related Q-wave MI	0.0% (0/185)
Target Lesion/Vessel Revascularization	0.0% (0/185)
Significant Embolic Events	2.2% (4/185)
Abrupt Closure	0.0% (0/185)
Subacute Closure	0.0% (0/185)
Major Bleeding Complications	0.0% (0/185)
Major Vascular Complications	1.1% (2/185)
Cerebrovascular Accident (CVA) (peri-procedural)	0.0% (0/185)

[1] Excludes one patient who withdrew their consent prior to 30 days and two patients without 30-day data.

Table 2c. Percentage of Adverse Events Through 30-days (Number of Events/Denominator for evaluable patients)

Combined In- and Out of Hospital Complications (to 30 days)	% (# of events / total evaluable sample) [1]
MACE (Death, procedure-related Q-wave MI, target lesions/vessel revascularization, or significant embolic events)	3.2% (6/185)
Death	0.5% (1/185)
Procedure-related Q-wave MI	0.5% (1/185)
Target Lesion/Vessel Revascularization	0.0% (0/185)
Significant Embolic Events	2.2% (4/185)
Abrupt Closure	0.5% (1/185)
Subacute Closure	0.0% (0/185)
Major Bleeding Complications	2.2% (4/185)
Major Vascular Complications	3.2% (6/185)
Cerebrovascular Accident (CVA) (peri-procedural)	0.0% (0/185)

[1] Excludes one patient who withdrew their consent prior to 30 days and two patients without 30-day data.

Table 2d. Percentage of Major Adverse Clinical Events Up To 9 To 12 months (Number of Events/Denominator for evaluable patients)

Description of Event	% (# of events / total evaluable sample) [1]
Combined In- and Out of Hospital MACE (to 9-12 months)	
MACE (Death, target lesions/vessel revascularization, or significant embolic events)	16.0% (29/181)
Death	2.8% (5/181)
Target Lesion/Target Vessel Revascularization	6.6% (12/181)
Significant Embolic Events	6.6% (12/181)
kidney/bowel infarct	0.5% (1/181)
gangrenous/ulcerated foot	0.0% (0/181)
decrease in renal function (>50% increase in creatinine levels)	6.1% (11/181)

[1] Excludes seven patients who were Lost to Follow-up or Withdrew their consent at 9-12 months.

5.2 Potential Adverse Events

Adverse events (in order of severity) may be associated with the use of a renal stent in renal arteries (including those listed in Tables 2a, 2b, 2c and 2d).

- Death
- Emergent Peripheral Artery Bypass Surgery
- Stroke/Cerebrovascular Accidents
- Stent thrombosis/occlusion
- Total occlusion of renal artery
- Acute myocardial infarction
- Perforation
- Restenosis of stented segment
- Kidney Infarct
- Renal Insuffiency or failure
- Arrhythmias, including VF and VT
- Dissection
- Emboli, distal (air, tissue or thrombotic emboli)

- Rupture of retroperitoneum or of neighboring organ
- Bowel Infarct
- Stent embolization
- Hemorrhage, requiring transfusion
- Arteriovenous fistula
- Pseudoaneurysm, femoral
- Spasm
- Tissue ulceration or necrosis
- Extremity ischemia
- Infection and pain at insertion site
- Hematoma at vascular site
- Drug reactions to antiplatelet agents/contrast medium
- Hypotension/Hypertension

6. CLINICAL STUDIES

6.1 The *SOAR* (Sub-Optimal Renal Angioplasty Results) Registry

The SOAR Registry was a prospective, multi-center, non-randomized study conducted in 26 North American clinical sites and included a total of one hundred and eighty eight (188) patients with atherosclerotic disease of the renal arteries following sub-optimal or failed percutaneous transluminal renal angioplasty (PTRA) a de novo lesion (≤ 15 mm in length) located within 10mm of the aortorenal border and with a reference vessel diameter of 5.0 to 7.0 mm. Sub-optimal or failed PTRA include any of the following: visible evidence of a residual stenosis ≥ 50% after optimal PTRA, visible evidence of intimal dissection > 6 mm, or peak systolic trans-stenotic gradient of ≥ 20 mmHg or a mean of ≥ 10mm Hg. A clinical events committee adjudicated all major clinical events and clinically driven TLR.

6.2 Primary Endpoints

The primary endpoints in the SOAR registry were Major Adverse Clinical Event (MACE) rate defined as the composite of death, procedural Q-wave MI, target lesion/vessel revascularization (repeat PTRA), or significant embolic events (kidney /bowel infarct, gangrenous/ulcerated foot, decrease in renal function as determined by creatinine levels) at 30 days. MACE rate defined as the composite of death, target lesion/vessel revascularization (repeat PTRA), or significant embolic events (kidney /bowel infarct, gangrenous/ulcerated foot, decrease in renal function as determined by creatinine levels) at 9-12 months and restenosis rate at 9-12 months as determined by duplex ultrasound.

6.3 Patients Studied

The 188 patients (58% female) studied ranged in age from 42 to 94 years with an average of 69 ± 10 (mean ± SD) years. All patients presented with significant chronic or new-onset hypertension resistant to medication with normal or mild renal dysfunction and were undergoing elective single *de novo* or restenotic lesion treatment in a renal artery. Eligible patients had visually estimated stenosis ≥ 50% in lesions ≤ 15 mm in length in a renal artery ≥ 5.0 mm and ≤ 7.0 mm in diameter.

6.4 Methods

Patients in the SOAR Registry underwent balloon angioplasty (1:1 balloon to artery ratio) after which a stent system(s) of the appropriate length and diameter was selected and deployed. The Bridge™ Extra Support could be re-inflated up to 12 ATM to further dilate the stent to assure complete apposition of the stent to the artery wall. If needed, further inflations were performed with a non-compliant balloon with a balloon-to-artery ratio of 1:1. Clinical follow-up was conducted at 30 days, 3 months, 6 months and at 9-12 months.

The anticoagulation regimen administered was 325 mg/day of aspirin for at least 14 days; and per physician's discretion, ticlopidine, 250 mg b.i.d. was given for 14 days, or clopidogrel 75 mg q.d. was given for 30 days.

The principal effectiveness and safety results for the SOAR Registry are in Table 3.

Kaplan-Meier survival curve for freedom from target lesion/vessel revascularization is presented in Figure 2.

6.5 Results

The results of the SOAR study, as shown in the following tables and figures, demonstrate Acute Success as defined by: Device Success (92.4%, 157/170), Procedural Success (92.9%, (158/170), and Clinical Success (92.9%, 158/170). A total of 78.6% of patients were MACE free at the 9-12 month time period. Average systolic and diastolic Blood Pressure results demonstrated a decrease from baseline where: Baseline average systolic = 160.0 ± 27.2 and 9-12 month average systolic = 146.5 ± 22.1. Baseline average diastolic = 77.3 ± 13.3 and 9-12 month diastolic = 75.9 ± 11.7. The summary of Antihypertensive medications indicate 4.68% of patients saw a reduction in both # of meds and dose, 46.6% saw a reduction in # of meds or dose, 4.6% saw a reduction in # of meds but an increase in dose, and 2.8% saw a reduction in dose, but an increase in the # of meds. In addition, the results demonstrate a 16.8% (27/161) 9-12 Month Incidence of Restenosis. Total MACE at 9-12 months was 16.0% (29/181), this included five Deaths (5/181), 12 (12/181) Target Lesion Vessel Revascularization (TLR/TLV), and 12 (12/181) Significant Embolic Events. The patient average "improved" Serum Creatinine values at 9-12 months were 1.0 ± 0.3 (8/168). The patient average "no change" Serum Creatinine values at 9-12 months were 1.2 ± 0.3 (131/168). Finally, the patient average "worsened" Serum Creatinine values at 9-12 months were 1.6 ± 0.5 (29/168).

TABLE 3. Principal Effectiveness and Safety Results
Bridge ™Extra Support
All Patients Treated

Effectiveness Measures	% (# of events / total evaluable sample) [1] [CI]
Acute Success: [2]	
Device Success	92.4% (157/170)
Procedure Success	92.9% (158/170)
Clinical Success	92.9% (158/170)
9-12 Month Incidence of Restenosis	16.8% (27/161)
Post-Procedure In-Stent Minimal Lumen Diameter (MLD, in mm)	
Mean ± SD (N)	4.99 ± 0.78 (185)
Range (min, max)	3.20, 7.14
Post-Procedure In-Stent Percent Diameter Stenosis (% DS)	
Mean ± SD (N)	2.5 ± 12.1 (185)
Range (min, max)	-38.0, 37.0
Target Lesion Revascularization/ Target Vessel Revascularization (TLR/TVR)-Free at 30 Days*	100%
TLR/TVR-Free at 9-12 Months*	90.9% [83.7%, 98.2%]
TVF-Free at 30 Days*	100%
TVF-Free at 9-12 Months*	90.9% [83.7%, 98.2%]
Death-Free at 30 Days*	99.5% [98.4%, 100%]
Death-Free at 9-12 Months*	97.2% [94.7%, 99.6%]
Major Adverse Clinical Event (MACE)- Free at 30 Days*	97.9% [95.8%, 99.9%]
MACE- Free at 9-12 Months*	78.6% [69.4%, 87.9%]
Secondary Measures:	
Summary of Blood Pressure (mmHg) Results	
Average Systolic	
Baseline	160.0 ± 27.2 (188)
30 days	148.6 ± 21.9 (183)
9-12 months	146.5 ± 22.1 (175)
Average Diastolic	
Baseline	77.3 ± 13.3 (188)
30 days	76.4 ± 11.8 (183
9-12 months	75.9 ± 11.7 (175)
Summary of Antihypertensive Medications (meds) (9-12 months)	
Reduction in both # of meds **and** dose	4.68% (8/176)
Reduction in # of meds **or** dose	46.6% (82/176)
Reduction in # of meds, **but** increase in dose	4.6% (8/176)
Reduction in dose, **but** increase in # of meds	2.8% (5/176)
No reduction in either # of meds or dose	41.5% (73/176)

Safety Measures and Other Clinical Events	% (# of events / total evaluable sample)
In-Hospital MACE	0.5% (1/188)
Out-of-Hospital MACE at 30 Days	2.7% (5/185)
Combined In and Out-of-Hospital MACE at 9-12 Months	16.0% (29/181)
Death	2.8% (5/181)
Target Lesion/Target Vessel Revascularization	6.6% (12/181)
Significant Embolic Events	6.6% (12/181)
Combined In and Out-of-Hospital MACE to 30 Days	
Abrupt Closure	0.5% (1/185)
Sub-acute Closure	0.0% (0/185)
Major Bleeding Complications	2.2% (4/185)
Major Vascular Complications	3.2% (6/185)
Cerebrovascular Accident (CVA) (peri-procedural)	0.0% (0/185)
Secondary Measures:	
Serum Creatinine: (mg/dl)	
Baseline - Mean ± SD (N)	1.2 ± 0.3 (188)
30 Day Improved	0.9 ± 0.4 (8/167)

30 Day No Change	1.18 ± 0.31 (138/167)
30 Day Worsened	1.5 ± 1.2 (21/167)
9-12 Month Improved	1.0 ± 0.3 (8/168)
9-12 Month No Change	1.2 ± 0.3 (131/168)
9-12 Month Worsened	1.6 ± 0.5 (29/168)

Note: Numbers are % (actual data / available sample size, N) or Mean ± Standard Deviation (SD). Confidence intervals (CI) are exact binomials.

[1] Denominators adjusted for available patient data for each parameter accordingly.

[2] **Acute success** was determined by angiographic evidence ≤30% residual stenosis and <5mm mean residual trans-stenotic pressure gradient in 170 patients and classified according to 3 levels:

Device success – Acute success using the Bridge™Extra Support stent(s).

Procedure success - Acute success using any percutaneous method, i.e., stent placement followed by another device.

Clinical procedural success - Procedural success without the occurrence of any major adverse clinical event prior to hospital discharge.

9-12 Month Incidence of Restenosis - Determined from the results of the duplex ultrasound scan as determined/defined by the presence of a peak systolic velocity of >180cm/sec and a corresponding renal/aortic ratio (RAR)≥ 3.5.

*Survival estimates by Kaplan-Meier method; Standard Error estimates by Peto formula:

TLR/TVR-free – No target lesion/vessel revascularization.

TVF-free – No target lesion/vessel revascularization, procedure related Q-wave MI, or death not clearly due to a non-target lesion/vessel.

MACE-free at 30-days – No death, procedure related Q wave MI, TLR/TVR, or significant embolic event.

MACE-free at 9-12 months – No death, TLR/TVR, or significant embolic event.

In-Hospital MACE – Death, procedure-related Q-wave MI, target lesion/vessel revascularization (TLR/TVR), or significant embolic events (defined as kidney/bowel infarct, gangrenous/ulcerated foot or decrease in renal function as determined by creatinine levels) prior to discharge as determined by the independent Clinical Events Committee (CEC).

Out-of-Hospital MACE at 30 days – Death, procedure-related Q-wave MI, target lesion/vessel revascularization (TLR/TVR), or significant embolic events from hospital discharge through 30 days, as determined by the CEC.

Out-of-Hospital MACE at 9-12 months – Death, target lesion/vessel revascularization (TLR/TVR), or significant embolic events from hospital discharge through 9-12 months, as determined by the CEC

Abrupt Closure - closure occurring within 24 hours of the procedure

Sub-acute Closure - closure between 24 hours and 30 days

Major bleeding complications - A procedural related vascular access site/bleeding event that requires a transfusion of blood or blood products or a transfusion required during the hospitalization for the stent implant if not clearly procedure related.

Major vascular complications - Any procedure related event such as hematoma at access site >4 cm, retroperitoneal bleed, pseudoaneurysm, arteriovenous fistula, peripheral ischemia/nerve injury, unexplained leg pain/Claudication/numbness, procedure related gastrointestinal/genitourinary bleeding or vascular access site complication requiring surgical repair.

Cerebrovascular Accident (CVA) – Occurrence of any peri-procedural ischemic or hemorrhagic neurological event, as determined by the independent Clinical Events Committee.

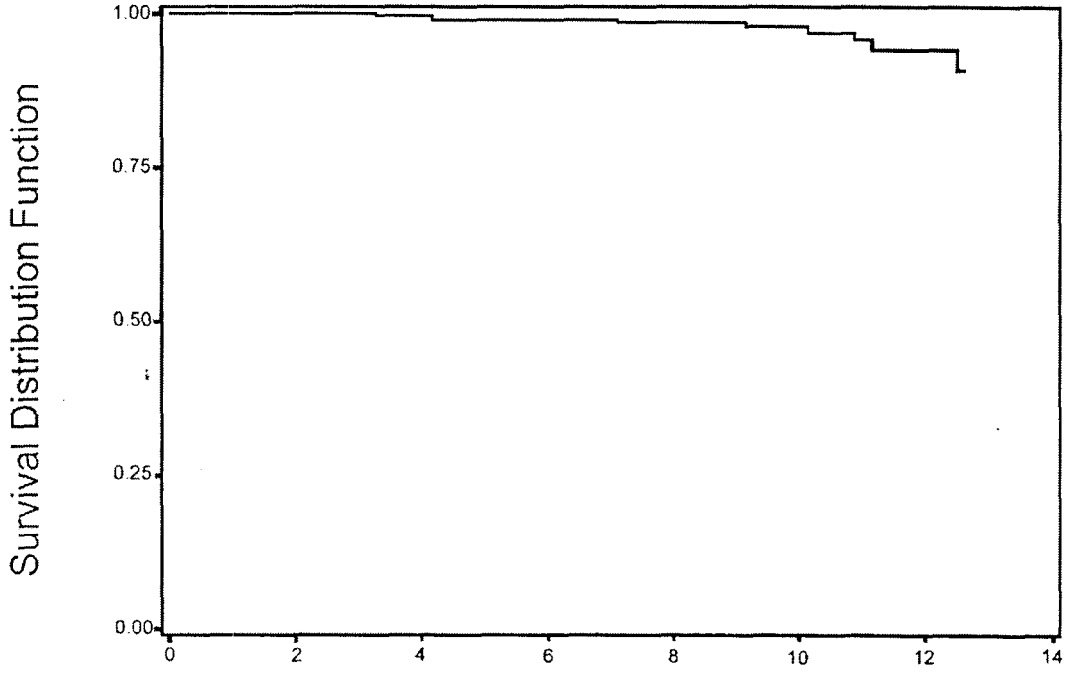
Serum Creatinine – (N) = Number of patients evaluated.

"Improved" if the baseline was "Normal" and the follow-up value was reducted by 25% of the baseline value or if the baseline was "Above normal" and the follow-up value was reducted by 20%.

"Worsened" if the baseline was "Normal" and the follow-up value was increased by 25% of the baseline value or if the baseline was "Above normal" and the follow-up value was increased by 20%.

"Normal" and "Above normal" refer to the baseline creatinine values. A value is considered "Normal" if it is ≤1.4mg/dl. "Above normal" ≥1.5mg/dl.

Figure 2. Survival Free From Target Lesion/Vessel Revascularization
All Patients Treated Through 12 months



	Time after initial procedure (months)							
	0	1	3	6	9	10	11	12**
# Entered	188	187	184	180	173	112	66	40
Number censored*	1	3	2	6	60	44	25	12
# at risk	187.5	185.5	183	177	143	90	53.5	34
# Events	0	0	2	1	1	2	1	1
# Events/Month	0	0	0.67	0.33	0.33	2.0	1.0	0.5
% Survived	100%	100%	98.9%	98.4%	97.7%	95.5%	93.7%	91.0%
S.E.	0%	0%	0.77%	0.95%	1.16%	1.90%	2.57%	3.68%
95% Confidence Interval (%)			97.4%-100%	96.5%-100%	95.4%-99.9%	91.8%-99.2%	88.7%-98.7%	83.7%-98.2%

* The number of patients who discontinue participation during the interval without having had a target lesion/vessel revascularization (e.g., because they are lost to follow-up or no longer participate in the study for a reason other than having target lesion/vessel revascularization).

** This interval extends up to 12.6 months to capture patients whose requirement for a revascularization was determined during the 9-12 month visit but had the actual TLR/TVR procedure performed outside the 12-month timeframe.

7. PATIENT SELECTION AND TREATMENT

7.1 Individualization of Treatment

The risks and benefits described above should be carefully considered for each patient before use of the Bridge™ Extra Support. Patient selection factors to be assessed should include a judgment regarding risk of prolonged anticoagulation. Stenting should be avoided in those patients at heightened risk of bleeding (e.g., those patients with recently active gastritis or peptic ulcer disease) (see Warnings). Treatment is acceptable for patients with sub-optimal or failed percutaneous transluminal renal angioplasty (PTRA) of a de novo lesion (≤ 15 mm in length) located within 10 mm of the aortorenal border and with a reference vessel diameter of 5.0 to 7.0 mm. Sub-optimal or failed PTRA include any of the following: visible evidence of a residual stenosis ≥ 50% after optimal PTRA, visible evidence of intimal dissection > 6 mm, or peak systolic trans-stenotic gradient of ≥ 20 mm Hg or a mean of ≥ 10 mm Hg. These patients should be monitored very carefully during the first month after stent implantation for any potential complications.

7.2 Use in Special Populations

The safety and effectiveness of the Bridge™ Extra Support have not been established in:

- Patients with **unresolved vessel thrombus at the lesion site**.
- Patients with renal artery **reference vessel diameters < 5.0 mm or >7.0mm**
- Patients with **diffuse disease or poor outflow distal** to the identified lesions.
- Patients with **overlapping stents** due to risk of thrombosis or poor flow.
- Patients with **restenotic lesions**.
- Patients for longer than **9-12 month follow-up**
- Patients with **more than one lesion** in a renal artery.
- Patients that have had **renal bypass surgery or are on renal dialysis**.
- Patients that have had an **organ transplant (i.e. heart, lung, kidney, etc.)** and are currently taking immuno-suppressant medications.
- Patients with **childbearing potential**.
- Patients with significant **bilateral ostial renal artery disease requiring bilateral treatment of both vessels during the procedure.**
- Patients with a history of **bleeding disorders**.

The safety and effectiveness of using mechanical atherectomy devices (directional atherectomy catheters, rotational atherectomy catheters), or laser angioplasty catheters, to treat in-stent stenosis have not been established.

8. HOW SUPPLIED

STERILE: This device is sterilized with e-beam radiation. It is intended for single use only. Non-pyrogenic. Do not use if package is opened or damaged.

CONTENTS: One (1) Medtronic AVE Bridge™ Extra Support Over-the-Wire Renal Stent System.

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

9. CLINICIAN USE INFORMATION

9.1 Inspection Prior to Use

Carefully inspect the sterile package before opening. Do not use this product after the "Use By" date. If the integrity of the sterile package has been compromised prior to the product "Use By" date, (e.g., damage of the package) contact your local Medtronic AVE, Inc. Representative for return information. If the sterile package appears intact, carefully remove the system from the package and inspect for bends, kinks and other damage. Verify that the stent is located between the radiopaque markers. Do not use if any defects are noted.

9.2 Materials Required

Quantity	Material
	Appropriate guiding catheter or sheath. (See Table 1- Device Specifications)
1	20 cc syringe.
	Heparinized Normal Saline.
1	0.035 inch x 180 cm guidewire or appropriate guidewire for a 75 cm or a 120 cm delivery catheter.
1	Rotating hemostatic valve.
	Contrast medium diluted 1:1 with heparinized normal saline.
1	Inflation device.
1	Torque device.
Optional	Three-way stopcock.

9.3 Preparation

9.3.1 Guidewire Lumen Flush

Step	Action
1	Flush Stent Delivery System guidewire lumen with heparinized normal saline until fluid exits the distal tip.
2	Remove protective sheath covering from the stent/balloon. Care should be taken not to disrupt the stent.
3	Verify that the stent is positioned between the proximal and distal balloon markers.

9.3.2 Delivery System Preparation

Step	Action
1	Fill a 20 cc syringe with 5 cc of contrast/heparinized normal saline mixture (1:1).
2	Attach to delivery system and apply negative pressure for 20-30 seconds.
3	Slowly release pressure to allow negative pressure to draw mixture into balloon lumen.
4	Detach syringe and leave a meniscus of mixture on the hub of the balloon lumen.
5	Prepare inflation device in standard manner and purge to remove all air from syringe and tubing.

6	Attach inflation device to catheter directly ensuring no bubbles remain at connection.
7	Leave on ambient pressure (neutral position). **Note: Do not pull negative pressure on inflation device after balloon preparation** and prior to delivering the stent.
8	Moisten the stent with heparinized normal saline by submerging the stent into a sterile bowl containing the solution. **Note: Do not use gauze sponges to wipe down the stent as fibers may disrupt the stent.**
9	Visually inspect the stent to ensure the stent is placed within the area of the proximal and distal balloon markers.
10	Check the integrity of the stent attachment on the delivery system by gently running the stent segment through your thumb and finger. If not intact, contact your Medtronic AVE, Inc. representative and return the unused device to Medtronic AVE, Inc.

9.4 Delivery Procedure

Step	Action
1	Prepare vascular access site according to standard PTRA practice.
2	Pre-dilate the lesion/vessel with appropriate diameter balloon having a ratio of 1:1 with the diameter of the vessel.
3	Maintain neutral pressure on inflation device. Open rotating hemostatic valve to allow for easy passage of the stent. **Note:** If resistance is encountered, **do not force passage**. Resistance may indicate a problem and may result in damage to the stent if it is forced. Remove the system and examine.
4	Ensure guiding catheter or sheath stability before advancing the Stent Delivery System into the renal artery. Carefully advance the Stent Delivery System into the hub of the guiding catheter or sheath.
5	**Note:** If the physician encounters resistance to the Stent Delivery System prior to exiting the guiding catheter, **do not force passage**. Resistance may indicate a problem and may result in damage to the stent if it is forced. Maintain guidewire placement across the lesion and remove the Stent Delivery System as a single unit (see Stent/System Removal – Precautions).
6	Advance delivery system over the guidewire to the target lesion under direct fluoroscopic visualization. Utilize the proximal and distal radiopaque markers on the balloon as a reference point. If the position of the stent is not optimal, it should be carefully repositioned or removed (see Stent/System Removal - Precautions). Expansion of the stent should not be undertaken if the stent is not properly positioned in the target lesion segment of the vessel.
7	Optimal stent placement requires the distal end of the stent to be placed approximately 1 mm beyond the distal end of the lesion.
8	Sufficiently tighten the rotating hemostatic valve. Stent is now ready to be deployed.

9.5 Deployment Procedure

Step	Action
1	Deploy stent by inflating balloon to nominal pressure to expand the stent. **Note:** Refer to product labeling and Table 12 for the proper stent inflation pressure. The Medtronic AVE Bridge Extra Support Over-the-Wire Renal Stent System may be re-inflated beyond nominal, without repositioning, up to rated burst, to assure complete apposition of the stent to the artery wall. **Do not exceed Rated Burst Pressure.**

2	Maintain inflation pressure for 15-30 seconds for full expansion of the stent.
3	**Note:** Under-expansion of the stent may result in stent movement. Care must be taken to properly size the stent to ensure the stent is in full contact with the arterial wall upon deflation of the balloon.

9.6 Removal Procedure

Step	Action
1	Deflate the balloon by pulling negative pressure on the inflation device. Allow adequate time, at least 15 seconds, for full balloon deflation. Longer stents may require more time for deflation.
2	Open the hemostatic valve to allow removal of the delivery system.
3	Maintain position of guiding catheter and guidewire to prevent it from being drawn into the vessel. Very slowly, withdraw the balloon from the stent maintaining negative suction, allowing movement of blood to gently dislodge the balloon from the stent.
4	After removal of the delivery system, tighten the hemostatic valve.
5	Repeat angiography and visually assess the vessel and the stent for proper expansion.
6	A second balloon inflation may be required to insure optimal stent expansion. In such instances, the Bridge™ Extra Support balloon may be re-inflated up to rated burst pressure or a non-compliant, higher-pressure balloon of adequate size (the same size as the Stent Delivery System balloon or larger) and length may be used to accomplish this. **Note:** In smaller or diffusely diseased vessels, the use of high balloon inflation pressures may over-expand the vessel distal to the stent and could result in vessel dissection. **Do not expand the Medtronic AVE Bridge™ Extra Support Renal Stent beyond 7.4 mm. See Table 4 for specific stent sizes and their corresponding balloon pressures.**
7	The final internal stent diameter should be equal to or slightly larger than the proximal and distal reference vessel diameters. A 1.1:1 ('step-up, step-down") angiographic appearance is optimum. If the lesion is aorto-ostial, the distal vessel should be used as the reference diameter.
8	Repeat angiography to evaluate and determine procedure status or termination. **Note:** Should the need arise for placement of a second stent to adequately cover the lesion length, placement of the stent most distal in the artery should be done prior to placement of the proximal stent, if possible.
9	**Note:** Observation of the patient and angiographic evaluation of the stent site should be performed periodically within the first 30 minutes after stent placement. If stent placement is associated with the onset of thrombus or suspected thrombus in the region of the stented segment, intra-renal infusions of a thrombolytic agent is recommended.

9.7 *In vitro* Information

Table 4: Bridge™ Extra Support Stent Inner Diameter (mm) vs. Inflation Pressure (ATM)

BRIDGE™ EXTRA SUPPORT STENT INNER DIAMETER (MM) *AVERAGE STENT INNER DIAMETER FOLLOWING DEPLOYMENT*									
System Diameter	*4 ATM*	*5 ATM*	*6 ATM*	*7 ATM*	*8 ATM**	*9 ATM*	*10 ATM*	*11 ATM*	*12 ATM***
5.0 mm	4.63	4.74	4.84	4.94	**5.00**	5.07	5.12	5.17	**5.21**
6.0 mm	5.54	5.69	5.82	5.93	**6.00**	6.08	6.14	6.20	**6.26**
7.0 mm	6.38	6.57	6.77	6.90	**7.00**	7.11	7.20	7.28	**7.36**

*Nominal Deployment Pressure (8 ATM)
Rated Burst Pressure for devices. **DO NOT EXCEED.

Note: 95 percent of all data points will fall within ± 7 percent of table values at nominal deployment pressure. The nominal *in vitro* device specification does not take into account lesion resistance. Stent sizing should be confirmed angiographically.

Note: Do not expand the stent beyond 7.4 mm.

Note: Balloon pressures should be monitored during inflation. **Do not exceed Rated Burst Pressure** as specified on product label as this may result in a ruptured balloon with possible intimal damage and dissection.

10. PATIENT INFORMATION (UNITED STATES ONLY)

In addition to the Instructions for Use, the Bridge™ Extra Support is packaged with additional specific information that includes:

- A Stent Implant Card that includes both patient information and stent implant information. All patients will be instructed to keep this card in their possession at all times for procedure/stent identification.

DISCLAIMER OF WARRANTY

NOTE: ALTHOUGH THE MEDTRONIC AVE BRIDGE EXTRA SUPPORT OVER-THE-WIRE, HEREAFTER REFERRED TO AS "PRODUCT," HAS BEEN MANUFACTURED UNDER CAREFULLY CONTROLLED CONDITIONS. MEDTRONIC, INC., MEDTRONIC AVE, INC. AND THEIR 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.

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