Proven Results in the Cephalic Arch

Covera™
Vascular Covered Stent
The Cephalic Vein Arch

The cephalic vein is the most frequently used vessel for patients in need of a native arterio-venous fistula (AVF).

The cephalic arch proximal to the ostium is a common area where high restenosis and rupture rates occur due to this site's unique architecture.

Challenges of the Cephalic Arch

- Natural Curvature - limited diametric vein expansion
- Hemodynamic Forces - pressure increase in the venous outflow leading to medial thickening
- “Tenting Effect” - straightening of the cephalic arch at the cephalic-axillary vein junction
- High concentration of valves

Cephalic Arch Stenosis (CAS)

Cephalic Arch Stenosis (CAS) is a common cause of hemodialysis AVF failure in patients with a functioning brachiocephalic AVF that can lead to:

- High venous pressures
- Greater rupture rates, prolonged bleeding after hemodialysis
- Dysfunctional hemodialysis
- AVF thrombosis
- AVF failure

Lesion Location and Treatment

Treatment of lesions in the cephalic arch can differ depending on its location. The cephalic arch is often divided into four segments to determine appropriate treatment when stenosis occurs.

Cephalic Arch Treatment

- Difference in diameter between the inflow and outflow vein:
  - Consider a flared configuration covered stent
- Proximal cephalic arch placement, covered stent length must:
  - Fully cover the ostial lesion so that it does not compromise flow in the axillary / subclavian vein
  - Extend ≥ 10 mm beyond the arch curvature into the straight distal cephalic vein segment

68% of all cephalic arch stenoses studied involved the ostium (seg.1) in some way, while 34% of all lesions occurred only in the ostium or ostial segment (seg.1)\(^1\)

\(^1\) In a BD-conducted imaging studies of cephalic arch stenosis treated with a stent or stent graft (N=79), the exact lesion location within the terminal cephalic vein was determined. Data on File. Bard Peripheral Vascular Inc., Tempe AZ
The ONLY Covered Stent Indicated

The Covera™ Vascular Covered Stent innovative design builds upon proven technologies from the category leader in AV Access. Designed with a patient-focused mindset, the Covera™ Vascular Covered Stent is engineered to provide a unique balance of attributes to help treat challenging lesions in tortuous vessel segments from the terminal cephalic arch, to the basilic swingpoint segments, to the AV graft venous anastomosis.

**Flexibility**

Helical design for radial strength and flexibility that offers a unique, flexible base stent architecture designed to conform to native vessel in challenging AV anatomy.

A review by BD of 46 imaging studies determined that the smallest mean curvature of the cephalic arch required without the guidewire in place was 26.9mm.

- The Covera™ Vascular Covered Stent demonstrated a minimum radius curvature of 15mm without internal or external support in a 37°C (body temperature) water bath.

**Higher Radial Force**

Engineered for flexing, compression, and torsion, with helical struts and angled bridges.

The Covera™ Vascular Covered Stent demonstrated a 24% higher mean radial force compared to the Gore™ Viabahn™ Endoprosthesis, for use at the venous anastomosis of an ePTFE or other synthetic AV graft.

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2 In a BD-conducted imaging study to determine cephalic arch inside radius (N=46), the smallest mean radius of curvature required was determined. Data on File. Bard Peripheral Vascular Inc., Tempe AZ.

3 Results based on bench testing. Bench testing may not be indicative of clinical performance. Different tests may yield different results. Data on File. Bard Peripheral Vascular Inc., Tempe AZ.

4 Covera™ Vascular Covered Stent is being compared to the Gore™ Viabahn™ Endoprosthesis on the basis of that each are indicated for the treatment of stenosis in the venous outflow at the venous anastomosis of a synthetic arteriovenous (AV) graft. These products, however, do not otherwise share the same indications for use and their product labels and instructions for use should be consulted for their respective indications, contraindications, hazards, warnings and precautions.

N=13. COVERA™ Vascular Covered Stent implant size 7x60mm; GORE™ Viabahn™ implant size 7x50mm. Test performed at 1mm oversizing, (0.17 N/mm vs. 0.13 N/mm).

Results based on bench testing. Bench testing may not be indicative of clinical performance. Different tests may yield different results. Data on File. Bard Peripheral Vascular Inc., Tempe AZ.
The ONLY covered stent indicated for use in dysfunctional AV fistulae.

The Covera™ Vascular Covered Stent is designed to:

- Optimize hemodynamic flow in an AV fistula or AV graft-vein anastomosis
- Help minimize the degree of disturbed flow when the diameter of the outflow vein is greater than the inflow vein

**Flared Ends**

The ONLY covered stent offered in a straight and flared configuration.¹

The Covera™ Vascular Covered Stent offers an additional 3mm in diameter on the flared configuration stent to:

- Support precise sizing and apposition to the vessel wall
- Avoid excessive oversizing when the outflow vein diameter is greater than the inflow diameter

¹ 30 mm lengths available in straight configurations only

**Optimized Hemodynamic Flow**

To address the distinct hemodynamics of the AV access circuit post-fistula creation. The Covera™ Vascular Covered Stent is designed to:

- Optimize hemodynamic flow in an AV fistula or AV graft-vein anastomosis
- Help minimize the degree of disturbed flow when the diameter of the outflow vein is greater than the inflow vein

Images are provided for illustrative purposes only. May not be indicative of clinical performance.
The Covera™ Vascular Covered Stent delivered effective results and demonstrated the benefits of its innovative design in two separate clinical trials. The AVEVA Clinical trial for patients dialyzing with AV Grafts and the AVENEW Clinical Trial for patients dialyzing with AV Fistulae.

### Study Design
- **Prospective, Multi-Center, Randomized, Concurrently-Controlled**

### Objective
To assess the safety and effectiveness of the Covera™ Vascular Covered Stent for the treatment of stenotic lesions in the upper extremity venous outflow of the AV Access circuit vs. PTA alone

### Number of Subjects/Sites
280 randomized subjects at 24 active investigational sites (US, EU, & ANZ)

### Primary Effectiveness Endpoint
Target Lesion Primary Patency (TLPP) - 6 months

### Primary Safety Endpoint
Freedom from any serious protocol-defined safety event(s) involving the AV access circuit through 30 days

#### MET BOTH PRIMARY END POINTS

### Cephalic Arch Subgroup
At 6 months, the Covera™ Vascular Covered Stent demonstrated greater TLPP compared to PTA alone in all target lesions treated at the cephalic vein arch.

- **55%**
  - of stenosis was located in the cephalic vein arch
  - N=78

- **50%**
  - of Covera™ Vascular Covered Stent placements in the cephalic arch were flared configuration

### DATAPoints
- **79%**
  - Survival Probability 6 Months
  - Covera™

- **58%**
  - Survival Probability 12 Months
  - Covera™

- **48%**
  - Survival Probability 6 Months
  - PTA

- **21%**
  - Survival Probability 12 Months
  - PTA

The Covera™ Vascular Covered Stent was superior to the PTA control with respect to TLPP at 6 & 12 months.

- **75%**
  - Survival Probability 6 Months
  - Covera™

- **51%**
  - Survival Probability 12 Months
  - Covera™

- **38%**
  - Survival Probability 6 Months
  - PTA

- **12%**
  - Survival Probability 12 Months
  - PTA

37% difference compared to PTA alone at 6 months

More than 4X the patency of PTA alone at 12 months
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AlhNMS Clinical Studies data on file. At 6 months in AlhNMS (N=280), TLP was 78.7% vs. 43.7% for PTA alone (p-value <0.001). TLP is defined as the interval following the index intervention until the next clinically-driven reintervention at or adjacent to the original treatment site or until the extremity was abandoned for permanent access. In AlhNMS TLP at 6 Months – Subgroup Analysis is provided as observational data without p-value or. In AlhNMS study, patients who received Covera™ Vascular Covered Stent had 103 reinventions involving a new lesion compared to 77 reinventions in the PTA only group. At 30 days in AlhNMS primary safety event of 95.8% vs. 96.3% for PTA alone (p-value <0.002). Freedom from primary safety events is defined as freedom from any adverse event, localized or systemic, that reasonably suggests the involvement of the AV access circuit (not including skin or thrombus) that require or result in any of the following alone or in combination: additional interventions (including surgery); in patient hospitalization or prolongation of an existing hospitalization; or death.

Covera™ Vascular Covered Stent Indication For Use: The Covera™ Vascular Covered Stent is indicated for use in hematodialysis patients for the treatment of stenosis in the venous outflow of an artery venous (AV) fistula and at the venous anastomosis of an ePTFE or other synthetic AV graft.

Contraindications: There are no known contraindications for the Covera™ Vascular Covered Stent.

Warnings: The device should be used only by physicians who are familiar with the complications, side effects, and hazards commonly associated with dialysis access stent arrangements and endovascular procedures. DO NOT expose the covered stent to temperatures higher than 500 °F (260 °C). ePTFE decomposes at elevated temperatures, producing highly toxic decomposition byproducts. DO NOT use the device if packaging has been tampered with or if the inner delivery sheath is not white in color. Careful attention by the operator is warranted to mitigate the potential for distal migration of the covered stent during deployment. Post dilation of the covered stent must be performed using appropriately sized PTA balloon catheters to avoid damage to the covered stent. The covered stent cannot be post dilated beyond its labeled diameter. The device is not intended to provide additional device fixation.

Precautions: Prior to covered stent implantation refer to the sizing table and read the Instructions for Use. Careful attention should be paid to ensure the device is appropriately sized to the vessel diameter, taking into account any change in the vessel diameter that may have resulted from previous interventions. For an AV graft access utilize the graft diameter as the reference vessel and for an AV fistula access, utilize the infrafistula diameter as the reference vessel. The appropriate length device should be selected so that the stent graft extends beyond the stenosis into at least 5 mm of the non-dilated stent graft or towards the arterial inflow and into the non-dilated vein approximately 5 mm beyond the stenosis. The delivery system is not intended for any use other than covered stent deployment. The covered stent (implant) cannot be repositioned after initial or partial deployment. Once partially or fully deployed, the covered stent cannot be retracted or repositioned on the delivery system. Device removal after deployment can only be done with a surgical approach. If unusual resistance is met during covered stent system introduction, the system should be removed and another covered stent system should be used. DO NOT introduce, manipulate or remove the delivery system without an appropriately sized guidewire in place and without fluoroscopic guidance. DO NOT kink or use a kinked delivery system. Device fixation.

Potential Complications and Adverse Events: Complications and Adverse Events associated with the use of the Covera™ Vascular Covered Stent may include the usual complications associated with endovascular stent and covered stent placement and dialysis wire maneuvers. In the clinical study of treatment of stenosis in the venous outflow of an autogenous AV fistula, development of new access circuit lesions has been reported at a lower rate than Covera™-treated subjects compared to PTA-treated subjects. Sixty (60) subjects treated with Covera™ Vascular Covered Stent required reinventions involving new lesions compared to 40 subjects who were treated with PTA alone. Potential complications may include, but are not limited to: New lesions in the access circuit requiring reintervention. Thrombotic occlusion, embolization of the target lesion requiring reintervention, pseudoaneurysm, vessel rupture, dissection, extravasation, perforation, pain, infection, hemorrhage, hematoma, arm or hand edema, steel syndrome, constrictive heart failure, cerebrovascular accident, allergic reaction, anaphylactic shock, re-occlusion, conversion to, fewer, proximal bleeding, vascular fistula, fistula, arm or hand edema, steel syndrome, constrictive heart failure, cerebrovascular accident, allergic reaction, anaphylactic shock, re-occlusion, conversion to, fewer, proximal bleeding, vascular fistula, fistula, risks associated with the use of the device, including, but not limited to device failure or malfunction, device-related complications, device-related events, device-related injuries, device-related deaths, and device-related adverse events.

Please consult product labels and package inserts for indications, contraindications, hazards, warnings, cautions, and information for use.