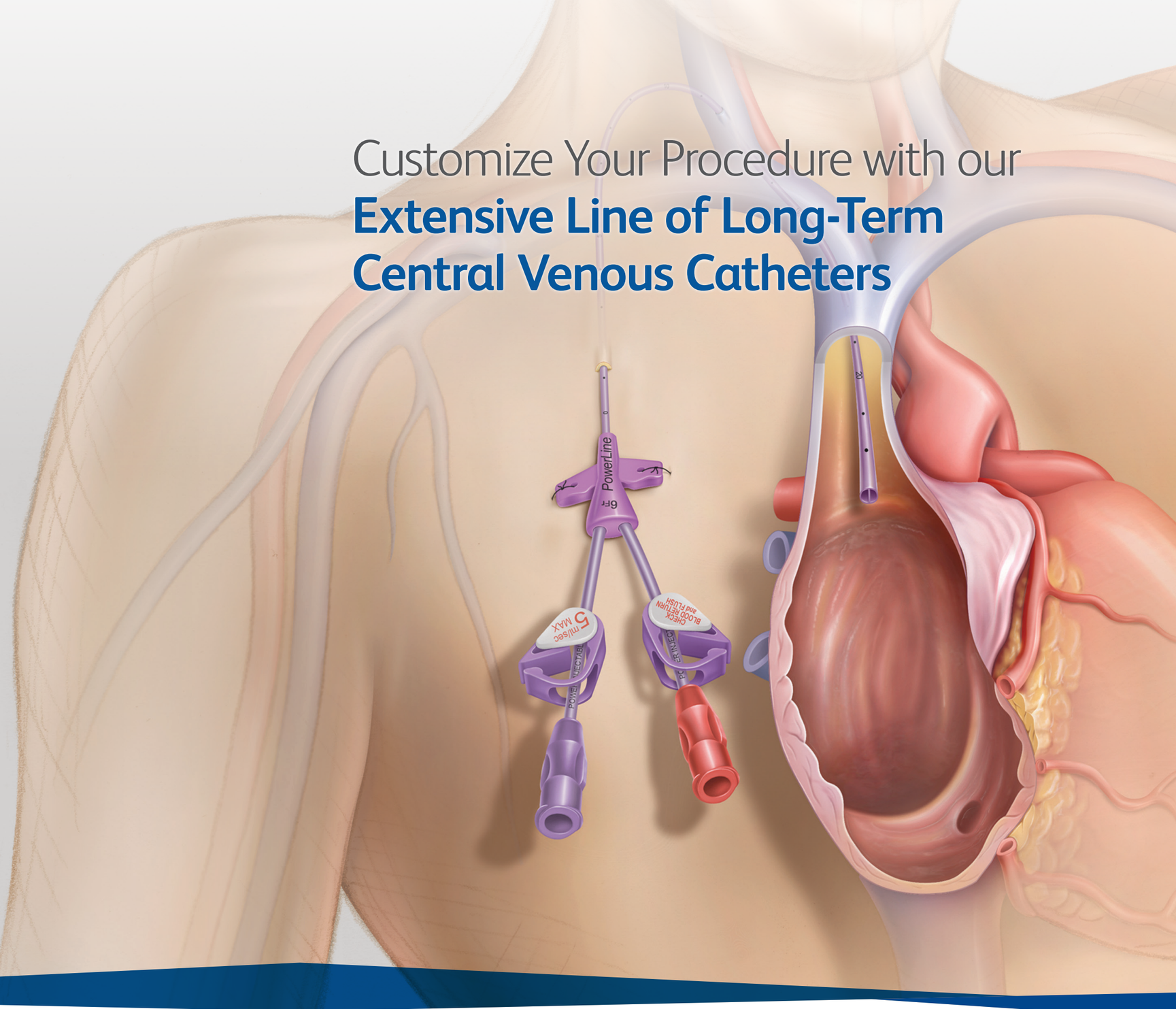
Customize Your Procedure with our

Extensive Line of Long-Term Central Venous Catheters



bd.com BD, Tempe, AZ, USA, 1 800 321 4254

For Long-Term or Short-Term Use
with Options for Power-Injection, Fluid Administration, and Apheresis

BD offers an extensive line of long-term Central Venous Catheters (CVC) with the choices you need for high performance, durability, and patient comfort during procedures.

Versatility

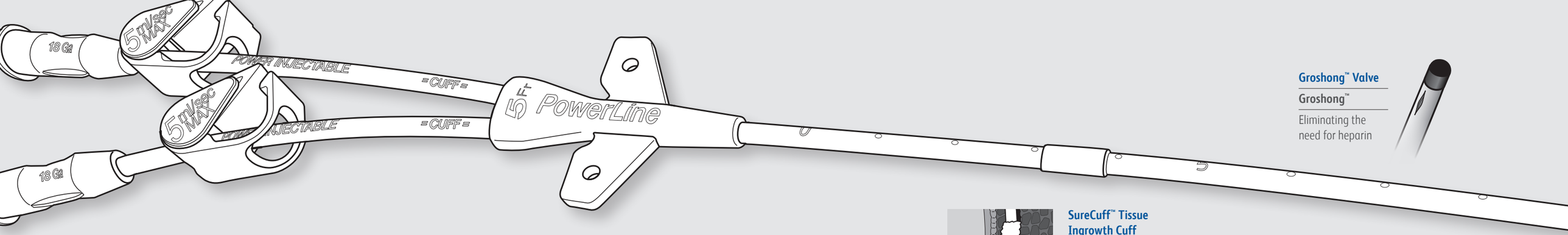
BD CVCs are available with standard or power-injection capabilities, polyurethane and silicone construction, and a variety of tip configurations.

Multiple Configuration Choices

Single, dual, and triple lumen options help you increase the flexibility and efficiency of treatment to your patients.

Strength and Durability

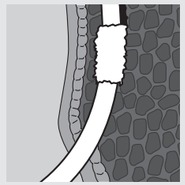
The materials and construction of BD CVCs provide strength and durability for both short-term and long-term use.



Groshong™ Valve

Groshong™

Eliminating the need for heparin



SureCuff™ Tissue Ingrowth Cuff

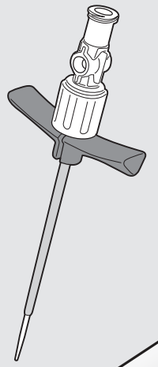
All BD chronic CVCs

Promotes tissue growth to secure catheter in place

Ideas and Features That Place **Excellent Products** In Your Hands

BD cuffed Central Venous Catheters offer several key features in a variety of configurations designed to provide you with the right device for your particular clinical and patient needs.

	French Size(s)	Lumen Configurations	Material	Power-Injectable	Cuffed	Repair Kit
Hickman™ TriFusion™	12	Triple	Polyurethane		●	
PowerHickman™	8, 9.5	Single Dual	Polyurethane	●	●	
PowerLine™	5, 6	Single Dual Triple	Polyurethane	●	●	
Groshong™	7, 8, 9.5	Single Dual	Silicone		●	●
Hickman™	7, 9, 9.6, 10, 12, 12.5	Single Dual Triple	Silicone		●	●
Leonard™	10	Dual	Silicone		●	●
Broviac™	2.7, 4.2, 6.6,	Single	Silicone		●	●



Microintroducer Kits

Hickman™ TriFusion™
PowerLine™
PowerHickman™

Reducing trauma to the insertion site

Taxol™/Taxetere™ Resistant

PowerHickman™

ChronoFlex™ catheter withstands strong chemotherapy agents

Power-Injectability

PowerLine™
PowerHickman™

Power-injection of contrast media

Apheresis CVC

Hickman™ TriFusion™

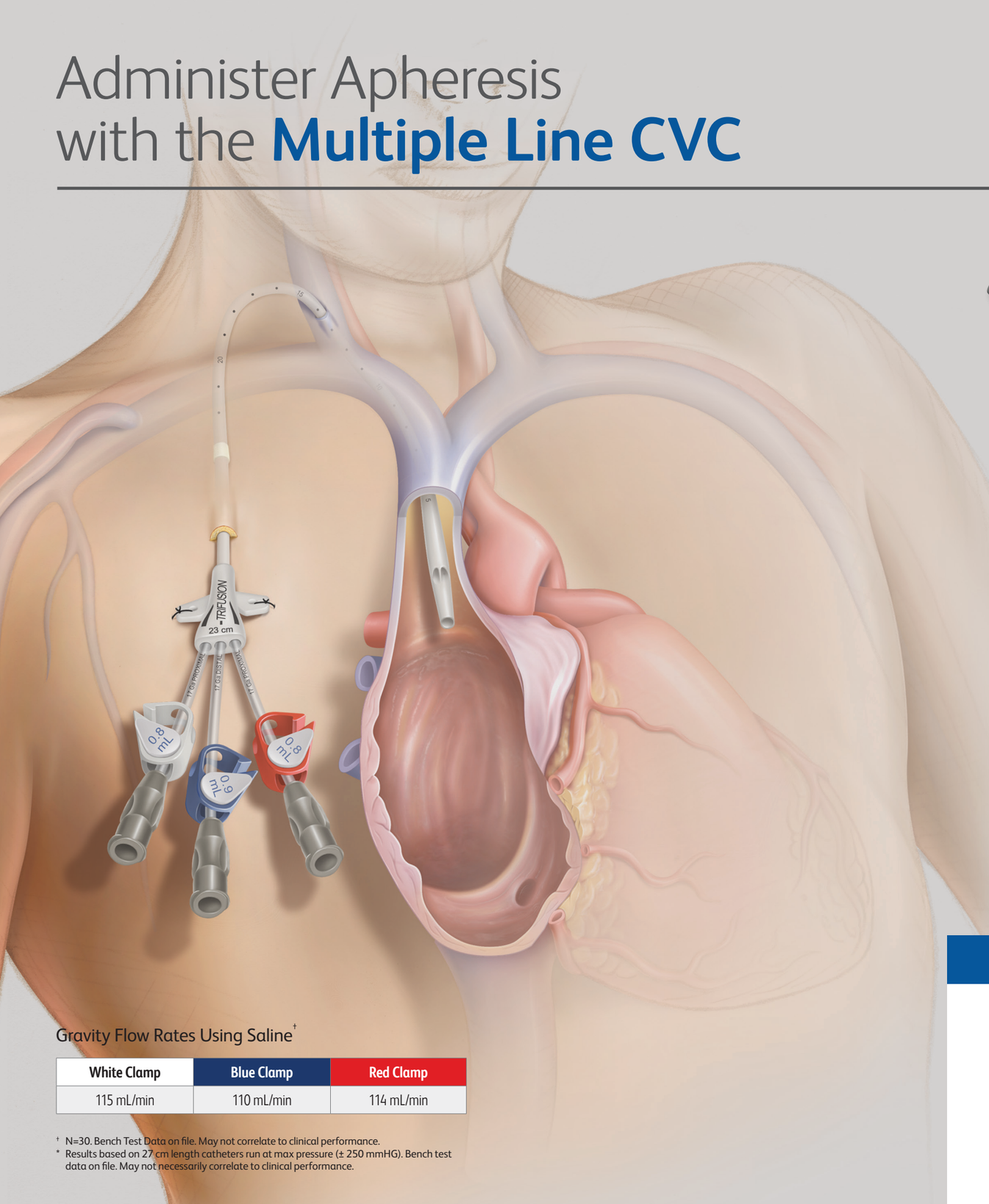
Triple lumen CVC with high flow rates, indicated for apheresis

Wide Range of French Sizes and Lumen Configurations

Hickman™, Leonard™, Broviac™

French sizes from 2.7 to 12.5 and lumen configurations for all patients

Administer Apheresis with the **Multiple Line CVC**



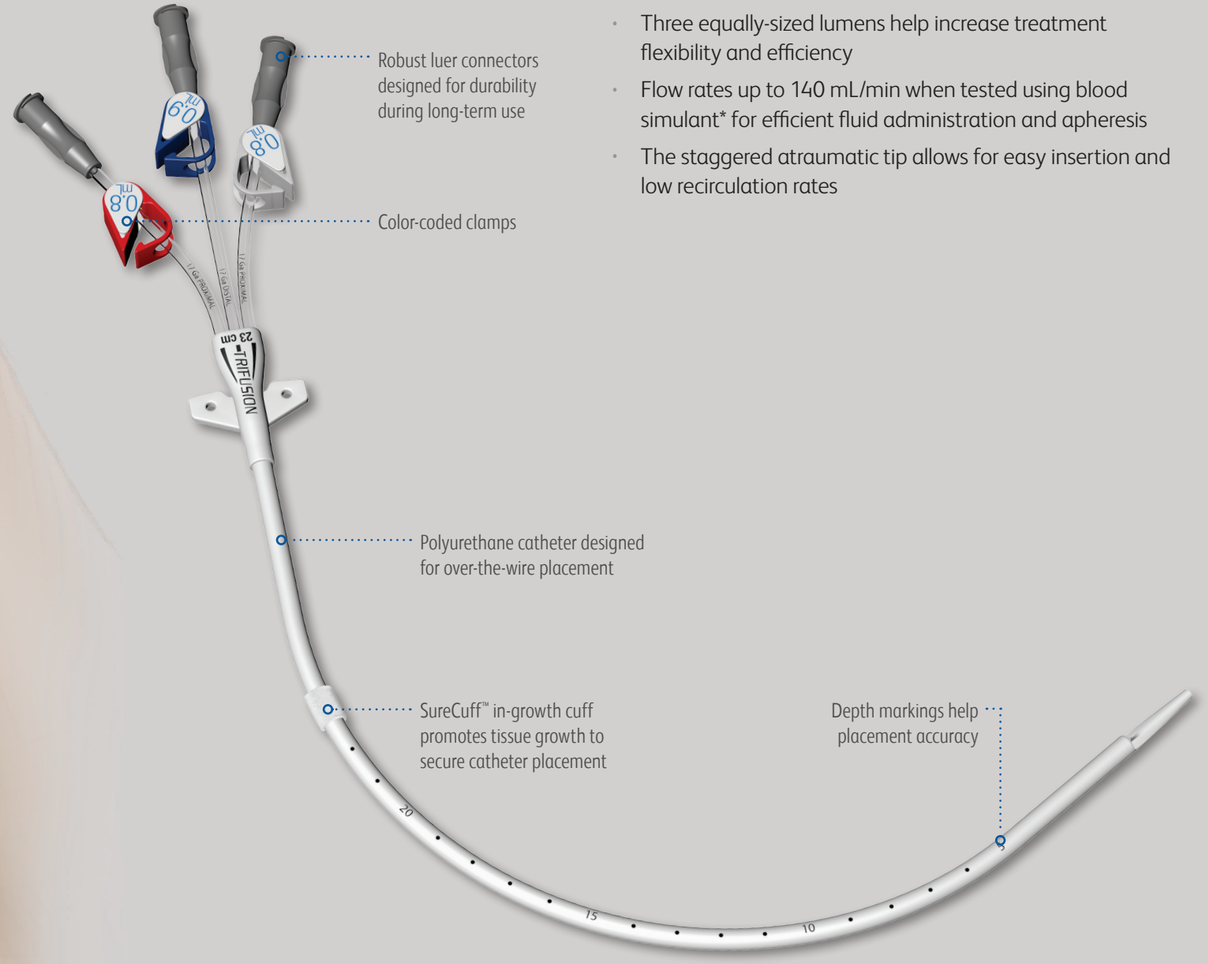
Gravity Flow Rates Using Saline†

White Clamp	Blue Clamp	Red Clamp
115 mL/min	110 mL/min	114 mL/min

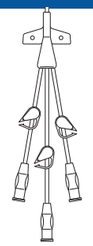
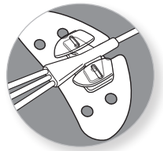
† N=30. Bench Test Data on file. May not correlate to clinical performance.
* Results based on 27 cm length catheters run at max pressure (± 250 mmHG). Bench test data on file. May not necessarily correlate to clinical performance.

Hickman™ TriFusion™

Triple Lumen Long-Term Central Venous Catheter



- Three equally-sized lumens help increase treatment flexibility and efficiency
- Flow rates up to 140 mL/min when tested using blood simulant* for efficient fluid administration and apheresis
- The staggered atraumatic tip allows for easy insertion and low recirculation rates

French Size	Lumens	Inner Lumen	Tip Configuration	Tray	Extras
12		 Three Equally-sized Lumens	 Staggered Atraumatic Tip	Intermediate Micro Introducer	 StatLock™ Stabilization Device Compatibility

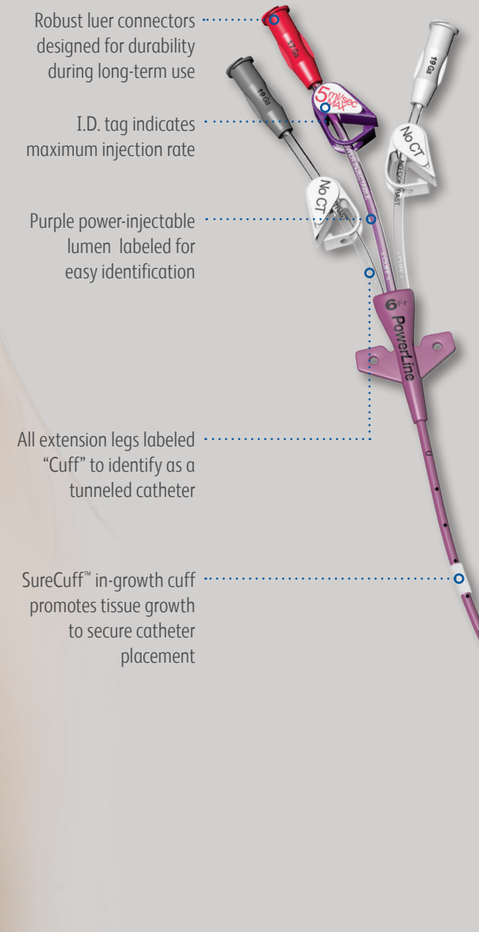
Low-Profile **Power-Injection** for your Patients

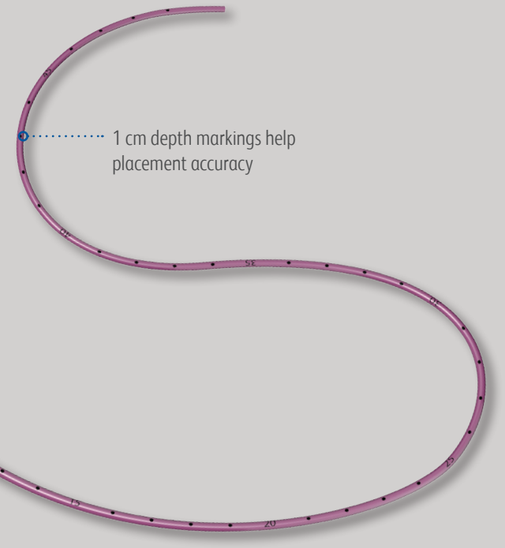
PowerLine™

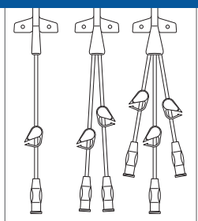
Central Venous Catheter

- Maximum 5 mL/sec flow rate at 300 psi pressure limit enables injection of contrast media for contrast enhanced computed tomography (CECT) scans
- Single, dual, and triple lumen options help increase the flexibility of your treatment
- Easy to identify purple power-injectable lumen

The Power of Purple™





French Size	Lumens	Inner Lumen	Tip Configuration	Tray	Extras
5,6		 Single, Dual, and Triple Lumens	 Straight Cut	Intermediate Micro Introducer	 StatLock™ Stabilization Device Compatibility

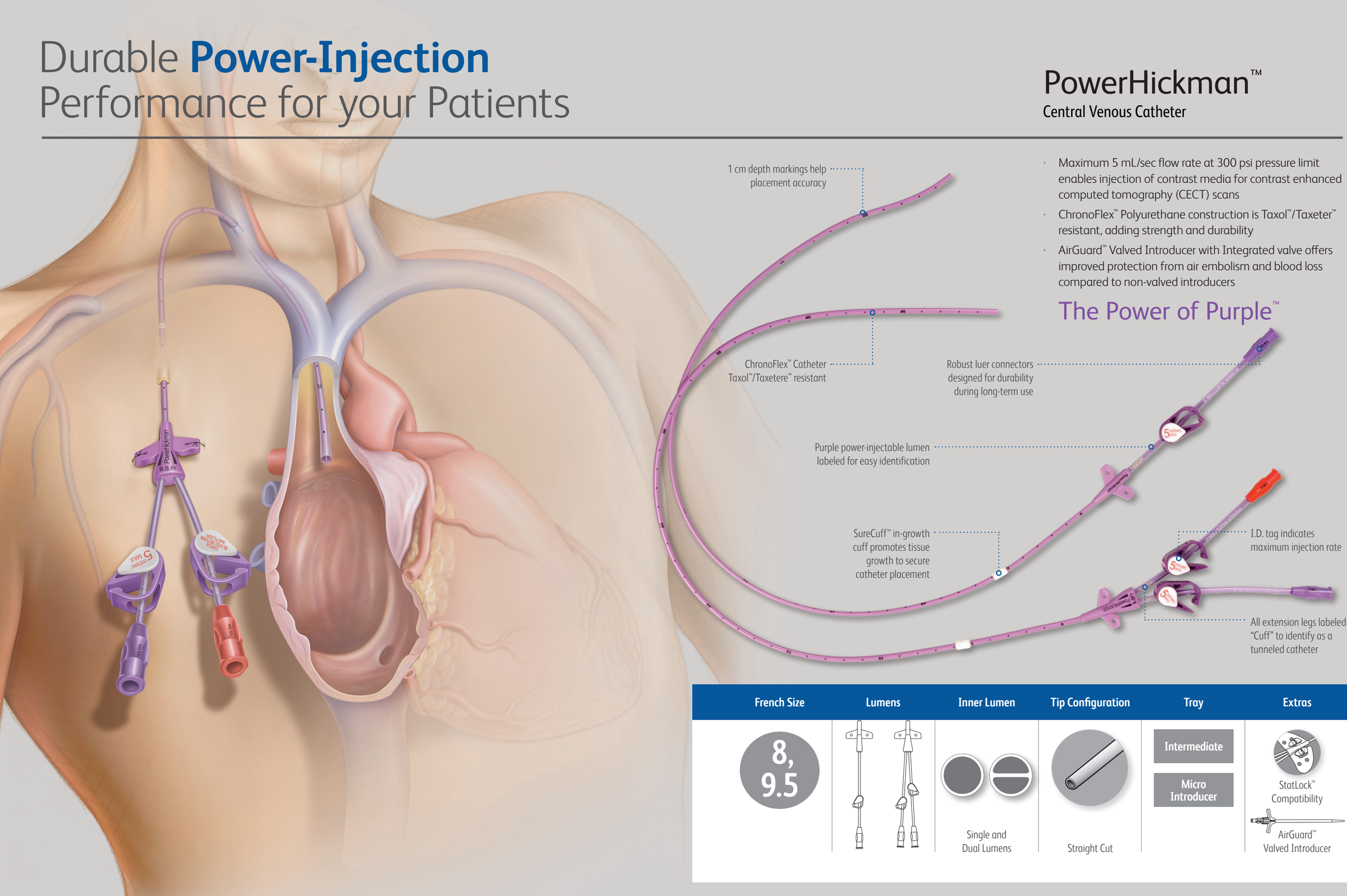
Durable **Power-Injection** Performance for your Patients

PowerHickman™

Central Venous Catheter

- Maximum 5 mL/sec flow rate at 300 psi pressure limit enables injection of contrast media for contrast enhanced computed tomography (CECT) scans
- ChronoFlex™ Polyurethane construction is Taxol™/Taxeter™ resistant, adding strength and durability
- AirGuard™ Valved Introducer with Integrated valve offers improved protection from air embolism and blood loss compared to non-valved introducers

The Power of Purple™

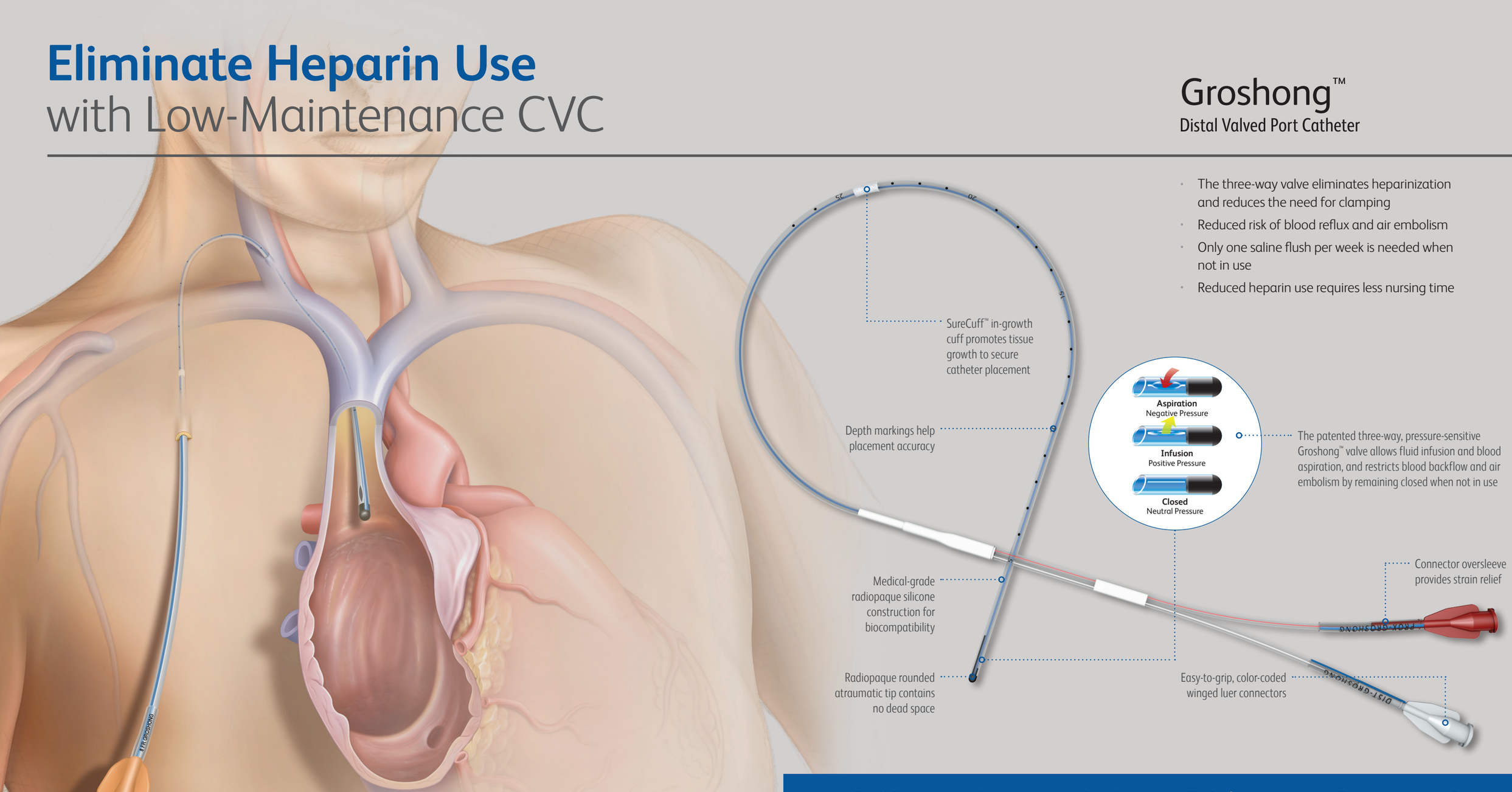


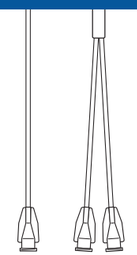
French Size	Lumens	Inner Lumen	Tip Configuration	Tray	Extras
8, 9.5		Single and Dual Lumens	Straight Cut	Intermediate Micro Introducer	StatLock™ Compatibility AirGuard™ Valved Introducer

Eliminate Heparin Use
with Low-Maintenance CVC

Groshong™
Distal Valved Port Catheter

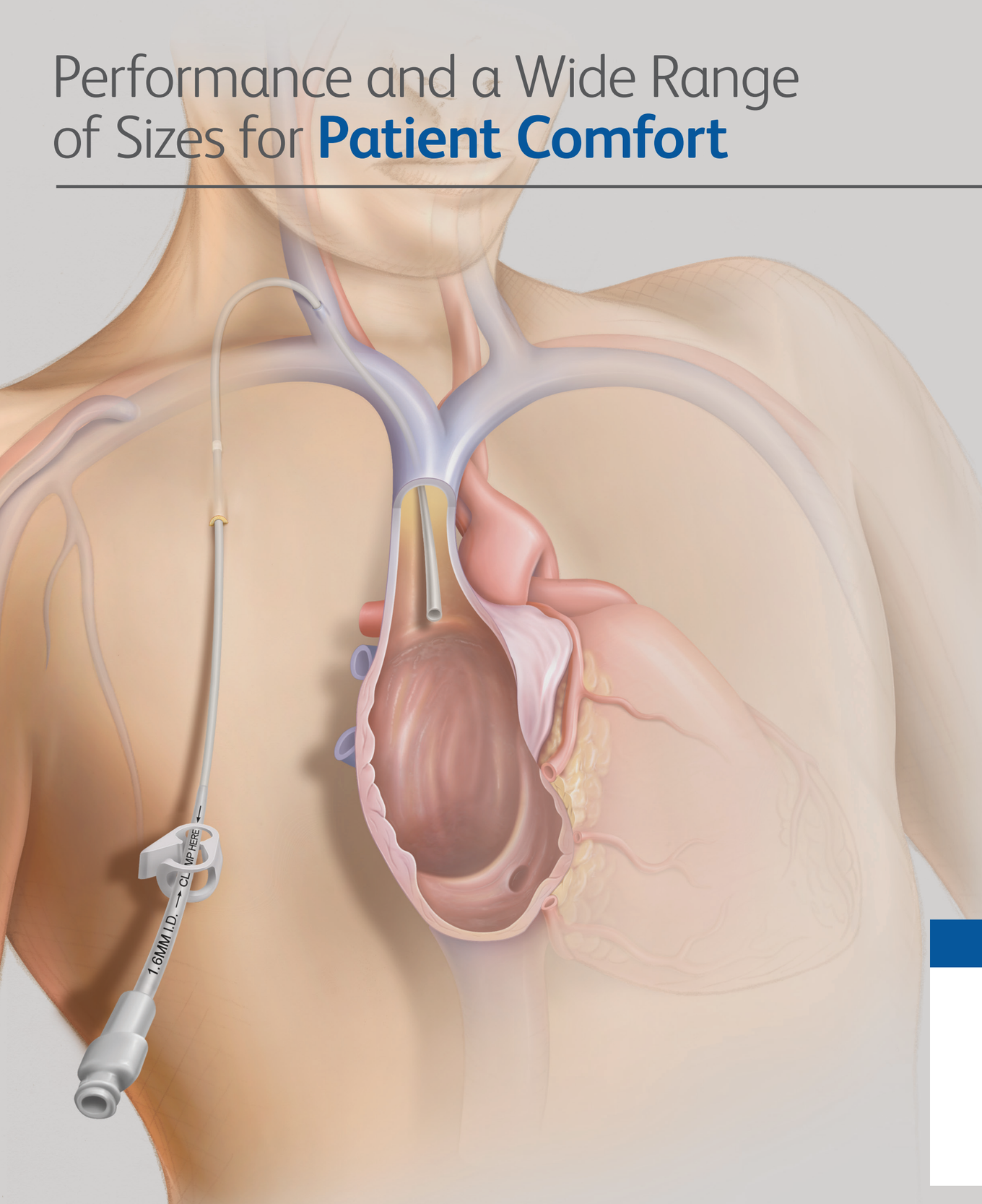
- The three-way valve eliminates heparinization and reduces the need for clamping
- Reduced risk of blood reflux and air embolism
- Only one saline flush per week is needed when not in use
- Reduced heparin use requires less nursing time



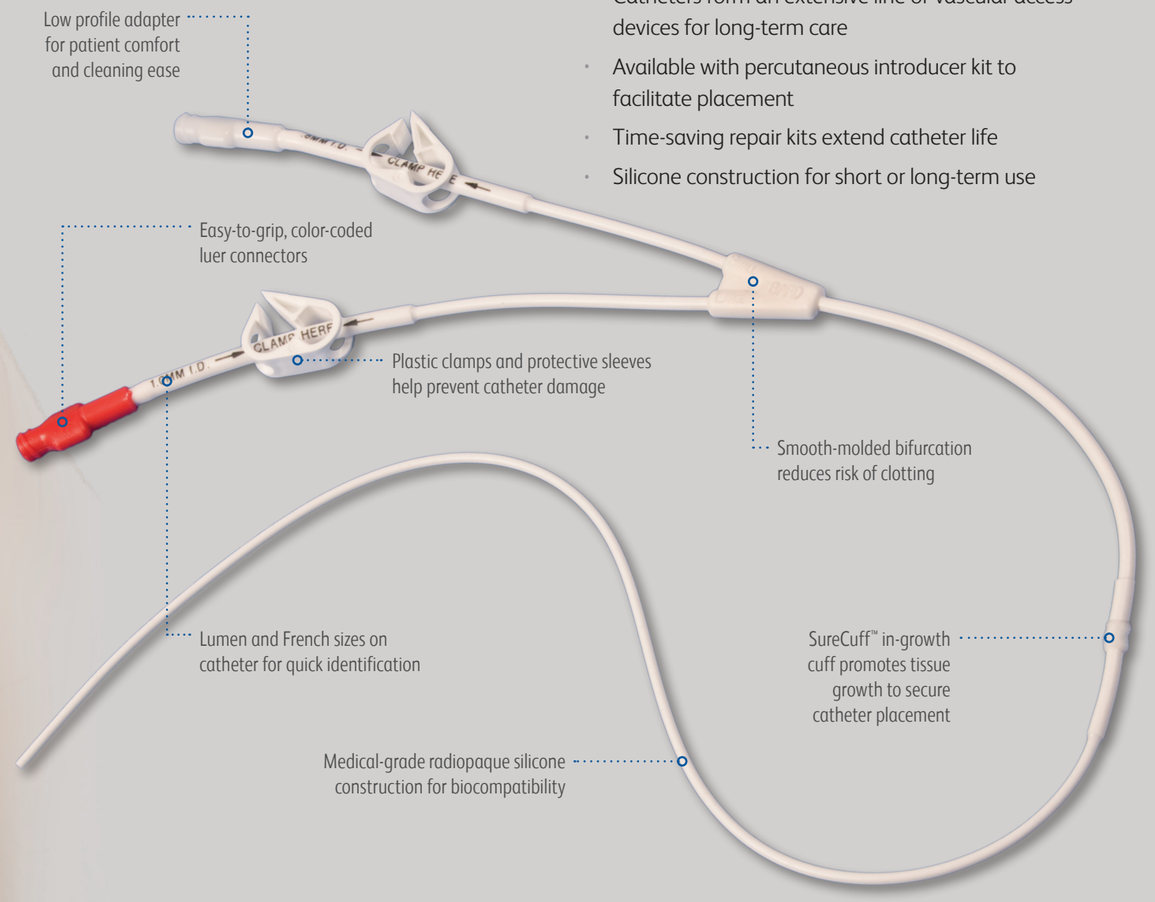
French Size	Lumens	Inner Lumen	Tip Configuration	Tray	Extras
7, 8, & 9.5		 Single and Dual Lumens	 Rounded, Closed, Radiopaque	Intermediate	Available Repair Kits

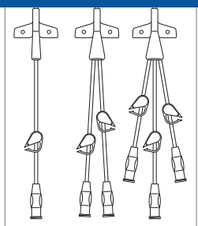
Performance and a Wide Range of Sizes for **Patient Comfort**

Hickman™ | Leonard™ | Broviac™
Central Venous Catheter | Central Venous Catheter | Central Venous Catheter



- The Hickman™, Leonard™, and Broviac™ Central Venous Catheters form an extensive line of vascular access devices for long-term care
- Available with percutaneous introducer kit to facilitate placement
- Time-saving repair kits extend catheter life
- Silicone construction for short or long-term use



French Size	Lumens	Inner Lumen	Tip Configuration	Tray	Extras
2.7-12.5		 Single, Dual, and Triple Lumens	 Soft, Silicone Atraumatic Tip	Peel-Apart Introducer Cutdown	Available Repair Kits

Hickman™ TriFusion™

Triple Lumen Long-Term Central Venous Catheter

Lumens	Tip to Cuff Length	French Size	Tray	Priming Volume (mL)	Product Code
Triple	19 cm	12 F	Intermediate	0.8 - White / 0.9 - Blue / 0.8 - Red	0609190
	19 cm	12 F	Microintroducer	0.8 - White / 0.9 - Blue / 0.8 - Red	0659190
	23 cm	12 F	Intermediate	0.8 - White / 0.9 - Blue / 0.8 - Red	0609230
	23 cm	12 F	Microintroducer	0.8 - White / 0.9 - Blue / 0.8 - Red	0659230
	27 cm	12 F	Intermediate	1.0 - White / 1.0 - Blue / 1.0 - Red	0609270
	27 cm	12 F	Microintroducer	1.0 - White / 1.0 - Blue / 1.0 - Red	0659270

Tray Components

Intermediate

- TriFusion™ Polyurethane Catheter with SureCuff™ Tissue Ingrowth Cuff
- Introducer, Peel Apart Sheath with Vessel Dilator
- 8 F Dilator
- 18 G Introducer Needle
- 70 cm Guidewire (0.038 in.)
- Tunneler
- StatLock™ Securement Device
- Dressing
- 3 End Caps
- Heparin Label

Microintroducer

- TriFusion™ Polyurethane Catheter with SureCuff™ Tissue Ingrowth Cuff
- Introducer, Peel Apart Sheath with Vessel Dilator
- 8 F Dilator
- 21 G Introducer Needle
- 5 F Microintroducer
- 45 cm Guidewire (0.018 in)
- 120 cm Guidewire (0.038 in)
- Tunneler
- StatLock™ Securement Device
- Dressing
- 3 End Caps
- Heparin Label

PowerLine™

Central Venous Catheter

Lumens	French Size	Tray	Priming Volume (mL)	Average Gravity Flow Rate (mL/hr)	Cuff Location (cm)	Length* (cm)	Total Length (cm)	Product Code
Single	5 F	Microintroducer	0.62	1245	5	50	62	0700515
Dual	5 F	Microintroducer	0.55 / 0.55	577 / 577	5	50	63	0720515
	6 F	Intermediate	0.61 / 0.61	981 / 981	5	50	63	0700610
	6 F	Microintroducer	0.61 / 0.61	981 / 981	5	50	63	0700615
Triple	6 F	Intermediate	0.67 / 0.45 / 0.45	924 / 360 / 360	5	50	66	0730610
	6 F	Microintroducer	0.67 / 0.45 / 0.45	924 / 360 / 360	5	50	66	0730615

Tray Components

Intermediate

- PowerLine™ Reverse Taper Polyurethane Catheter with SureCuff™ Tissue Ingrowth Cuff
- Introducer, Peel Apart Sheath with Vessel Dilator
- 18 G Introducer Needle
- 70 cm Guidewire (0.038 in.)
- Tunneler
- Scalpel
- Attachable Suture Wing
- Dressing
- End Cap(s)
- Syringe
- Vein Pick
- Vein Finder Needle (25 G X 2.5 cm)

Microintroducer

- PowerLine™ Reverse Taper Polyurethane Catheter with SureCuff™ Tissue Ingrowth Cuff
- MicroEZ™ Microintroducer
- Hydro-Glide™ Insertion Stylet
- 21 G Introducer Needle
- 70 cm Guidewire (0.018 in.)
- Tunneler
- Scalpel
- Attachable Suture Wing
- Dressing
- End Cap(s)
- Syringe

Power-Injection

Max. Flow Rate	Max. Pressure Setting
5 mL/sec	300 psi

*Distance from the most proximal measurement marker to catheter tip.

PowerHickman™

Central Venous Catheter

Lumens	French Size	Tray	Priming Volume (mL)	Average Gravity Flow Rate (mL/hr)	Cuff Location (cm)	Length* (cm)	Total Length (cm)	Inner Diam. (in.)	Outer Diam. (in.)	Product Code
Single	8 F	Intermediate	1.5	6780	5	47	61.7	0.060	0.106	0805810
	8 F	Microintroducer	1.5	6780	2	47	61.7	0.060	0.106	0802815
	8 F	Microintroducer	1.5	6780	5	47	61.7	0.060	0.106	0805815
Dual	9.5 F	Intermediate	1.3 (each)	3505 (each)	5	47	62.3	0.036	0.126	0805910
	9.5 F	Microintroducer	1.3 (each)	3505 (each)	2	47	62.3	0.036	0.126	0802915
	9.5 F	Microintroducer	1.3 (each)	3505 (each)	5	47	62.3	0.036	0.126	0805915

Tray Components

Intermediate

- PowerHickman™ Polyurethane Catheter with SureCuff™ Tissue Ingrowth Cuff
- AirGuard™ Valved Introducer
- Introducer, Peel Apart Sheath with Vessel Dilator
- 18 G Introducer Needle
- 45 cm Guidewire (0.035 in.)
- Tunneler
- StatLock™ Securement Device
- 2 Syringes
- Dressing
- End Cap(s)
- Safety Scalpel
- Vein Pick

Microintroducer

- PowerHickman™ Polyurethane Catheter with SureCuff™ Tissue Ingrowth Cuff
- AirGuard™ Valved Introducer
- MicroEZ™ Microintroducer
- 21 G Introducer Needle
- 70 cm Guidewire (0.018 in)
- 45 cm Guidewire (0.035 in)
- Tunneler
- StatLock™ Securement Device
- 2 Syringes
- Dressing
- End Cap(s)
- Safety Scalpel
- Vein Pick

Power-Injection

Max. Flow Rate	Max. Pressure Setting
5 mL/sec	300 psi

*Distance from the most proximal measurement marker to catheter tip.

Groshong™

Distal Valved Port Catheter

Lumens	French Size	Total Length (cm)	Tip to Cuff Length (cm)	OD (mm)	Repair Kit	Product Code
Single	7 F	51.58	24	2.2	7741700 body	7711700
	8 F	52.04	24	2.5	7741800 body	7711800
Dual	9.5 F	74.3	18	3.2	7742000 body 7740000 red and white legs	6626954
	9.5 F	74.3	24	3.2	7742000 body 7740000 red and white legs	7726950

Replacement Connectors For	Replaces	French Size	Lumens	Color	Units/Case	Product Code
7 F Single Lumen	Pink Connector	7 F	Single	Pink	10	7712700
8 F Single Lumen	Orange Connector	8 F	Single	Orange	10	7712800
9.5 F Dual Lumen	Red Connector	9.5 F	Dual	Red	10	7712500
9.5 F Dual Lumen	White Connector	9.5 F	Dual	White	10	7712510

Tray Components

- Groshong™ Silicone Catheter with SureCuff™ Tissue Ingrowth Cuff
- Introducer, Peel Apart Sheath with Vessel Dilator
- 18 G Introducer Needle
- 18 G Needle
- 22 G Needle
- 25 G Needle
- 45 cm Guidewire (0.035 in.)
- Tunneler
- End Cap(s)
- Syringes
- Scalpel
- Connector(s)
- Attachable Suture Wing
- Gauze (10 cm x 10 cm)
- Drape, Fenestrated

Accessory	Units/Case	Product Code
Stainless Steel Tunneler	5	0601940

Hickman™ | Leonard™ | Broviac™

Central Venous Catheter | Central Venous Catheter | Central Venous Catheter

Product Name	Lumens	French Size	Tray	Total Length (cm)	OD (mm) /ID (mm)	Repair Kit	Product Code
Broviac™ CVC	Single	2.7 F	Cutdown	71	0.95 / 0.5	0601600	0600040
Broviac™ CVC		4.2 F	Peel-Apart Introducer	71	1.45 / 0.7	0601610	0600520
Broviac™ CVC		4.2 F	Cutdown	71	1.45 / 0.7		0600060
Broviac™ CVC		6.6 F	Peel-Apart Introducer	90	2.2 / 1.0	0601620	0600540
Broviac™ CVC		6.6 F	Cutdown	90	2.2 / 1.0		0600120
Hickman™ CVC		9.6 F	Peel-Apart Introducer	90	3.1 / 1.6	0601630	0600560
Hickman™ CVC		9.6 F	Cutdown	90	3.1 / 1.6		0600160
Hickman™ CVC	Dual	7 F	Peel-Apart Introducer	65	2.3 / 1.0-red / 0.8-white	0601760 body 0601690 red leg 0601680 white leg	0600570
Hickman™ CVC		7 F	Cutdown	65	2.3 / 1.0-red / 0.8-white		0600310
Hickman™ CVC		9 F	Peel-Apart Introducer	65	2.9 / 1.3-red / 0.7-white	0601700 body 0601690 red leg 0601680 white leg	0600580
Hickman™ CVC		9 F	Peel-Apart Introducer	90	2.9 / 1.3-red / 0.7-white		0600600
Hickman™ CVC		9 F	Cutdown	90	2.9 / 1.3-red / 0.7-white		0600330
Leonard™ CVC		10 F	Peel-Apart Introducer	90	3.2 / 1.3-red / 1.3-white	0601750 body 0601690 red leg 0601680 white leg	0600630
Leonard™ CVC		10 F	Cutdown	90	3.2 / 1.3-red / 1.3-white		0600340
Hickman™ CVC		12 F	Peel-Apart Introducer	90	4.0 / 1.6-red / 1.6-white	0601710 body 0601690 red leg 0601680 white leg	0600620
Hickman™ CVC		12 F	Cutdown	90	4.0 / 1.6-red / 1.6-white		0600350
Hickman™ CVC	Triple	10 F	Peel-Apart Introducer	97	3.3 / 1.5-red / 0.8-white / 0.8-blue	0601790 body 0601690 red leg 0601680 white leg 0601730 blue leg	0606560
Hickman™ CVC		12.5 F	Peel-Apart Introducer	90	4.1 / 1.5-red / 1.0-white / 1.0-blue	0601740 body 0601690 red leg 0601680 white leg 0601730 blue leg	0600650
Hickman™, Leonard™, Broviac™ Plastic Tunneler 5 Pack							0601930
Hickman™ CVC Adhesive Kit							0601720

Tray Components

Peel Apart Introducer

- Radiopaque Silicone Catheter with SureCuff™ Tissue Ingrowth Cuff and Clamp
- Introducer, Peel Apart Sheath with Vessel Dilator
- Needle
- Guidewire "J" Tip with Straightener
- Tunneler
- End Cap
- Syringe
- I.D. Card

Cutdown

- Radiopaque Silicone Catheter with SureCuff™ Tissue Ingrowth Cuff and Clamp
- End Cap
- I.D. Card

Hickman™ TriFusion™ Triple Lumen Long-Term Central Venous Catheter

Indications for Use: The Hickman™ TriFusion™ Triple Lumen Long-Term Central Venous Catheter is indicated for use in attaining short-term or long-term vascular access for intravenous infusion therapy and blood sampling via the internal jugular vein, external jugular vein, and subclavian vein.

All Hickman™ TriFusion™ Catheters are designed for apheresis, and the administration of I.V. fluids, blood products, drugs, and parenteral nutrition solutions, as well as blood withdrawal. The Hickman™ TriFusion™ catheter incorporates three large, equal size lumens appropriate for apheresis procedures.

Contraindications: This device is contraindicated whenever: • The presence of device related infection, bacteremia, or septicemia is known or suspected. • The patient's body size is insufficient to accommodate the size of the implanted device. • The patient is known or is suspected to be allergic to materials contained in this device. • Severe chronic obstructive lung disease exists (percutaneous subclavian placement only). • Past irradiation of prospective insertion site. • Previous episodes of venous thrombosis or vascular surgical procedures at the prospective placement site. • Local tissue factors will prevent proper device stabilization and/or access.

Warnings: Percutaneous insertion of the catheter should be made into the axillary-subclavian vein at the junction of the outer and mid-thirds of the clavicle lateral to the thoracic outlet. The catheter should not be inserted into the subclavian vein medially, because such placement may cause compression of the catheter between the first rib and clavicle which can lead to damage or fracture and embolization of the catheter.[1] Fluoroscopic or radiographic confirmation of catheter tip placement should be helpful in demonstrating that the catheter is not being pinched by the first rib and clavicle.[1] • Acetone and PEG-containing ointments can cause failure of this device and should not be used with polyurethane catheters. Chlorhexidine patches are the preferred alternative. • Cardiac arrhythmias may result if the guidewire is allowed to pass into the right atrium. • Close all clamps only in the center of the extension legs. Extensions may develop cuts or tears if subjected to excessive pulling or contact with rough edges. Repeated clamping near or on the luer lock connectors may cause tubing fatigue and possible disconnection. • Catheters should be implanted carefully to avoid any sharp or acute angles which could compromise the opening of the catheter lumens. • To prevent air embolism and/or blood loss, place thumb over the exposed orifice of the sheath introducer. • To avoid damage to vessels and viscus, infusion pressures should not exceed 25 psi (172 kPa). The use of a 10 mL or larger syringe is recommended because smaller syringes generate more pressure than larger syringes. Note: A three pound (13.3 Newton) force on the plunger of a 3 mL syringe generates pressure in excess of 30 psi (206 kPa) whereas the same three pound (13.3 Newton) force on the plunger of a 10 mL syringe generates less than 15 psi (103 kPa) of pressure. • Accessories and components used in conjunction with this catheter should incorporate luer-lock adapters. • The heparin solution must be aspirated out of all lumens immediately prior to using the catheter to prevent systemic heparinization of the patient. • Failure to clamp extensions when not in use may lead to air embolism. • In the rare event of a leak, the catheter should be clamped immediately. Necessary remedial action must be taken prior to resuming the infusion procedure. • Do not resterilize the catheter or components by any method. The manufacturer will not be liable for any damages caused by reuse of the catheter or accessories. • Do not exceed flow rates of 140 mL per minute.

Precautions: Carefully read and follow all instructions prior to use. • Only qualified healthcare practitioners should insert, manipulate and remove these devices. • Repeated over tightening of blood lines, syringes and caps will reduce connector life and could lead to potential connector failure. In case of damage, clamp the catheter between the patient and the damaged area with a smooth-edged, atraumatic clamp. • Sterile and non-pyrogenic only if packaging is not opened, damaged or broken. • Sterilized with Ethylene Oxide. • Single Patient Use Only. • CAUTION: Federal (USA) law restricts this device to sale by or on the order of a physician. • Follow Universal Precautions when inserting and maintaining the catheter. • Follow all contraindications, warnings, cautions, precautions and instructions for all infusates as specified by its manufacturer.

Possible Complications: The use of an indwelling central venous catheter provides an important means of venous access for critically ill patients; however, the potential exists for serious complications including the following: air embolism, bleeding, brachial plexus injury, cardiac arrhythmia, cardiac tamponade, catheter or cuff erosion through skin, catheter embolism, catheter or cuff occlusion, catheter occlusion, damage or breakage due to compression between the clavicle and first rib, catheter-related sepsis, endocarditis, exit site infection, exit site necrosis, extravasation, fibrin sheath formation, hematoma, hemothorax, hydrothorax, inflammation, necrosis or scarring of skin over implant area, intolerance reaction to implanted device, laceration of vessels or viscus, perforation of vessels or viscus, pneumothorax, spontaneous catheter tip malposition or retraction, thoracic duct injury, thromboembolism, venous thrombosis, ventricular thrombosis, vessel erosion, risks normally associated with local and general anesthesia, surgery, and post-operative recovery.

Please consult package inserts for more detailed safety information and instructions for use.

References:

1. Aitken, D.R. and Minton, J.P. "The Pinch-Off Sign: A Warning of Impending Problems with Permanent Subclavian Catheters", American Journal of Surgery, Vol. 148, Nov. 1984, pp. 633-638.

PowerLine™ Central Venous Catheter

Indications For Use: The PowerLine™ catheter is indicated for short or long-term access to the central venous system. PowerLine™* catheters are designed for the administration of I.V. fluids, blood products, drugs, parenteral nutrition solutions, as well as blood withdrawal. In addition, PowerLine™ catheters allow for power-injection of contrast media and central venous pressure monitoring. The maximum recommended infusion rate is 5mL/sec. For central venous pressure monitoring, it is recommended that a catheter lumen of 20 gauge or larger be used.

Contraindications: The device is contraindicated whenever: • The presence of device related infection, bacteremia, or septicemia is known or suspected. • The patient's body size is insufficient to accommodate the size of the implanted device. • The patient is known or is suspected to be allergic to materials contained in the device. • Severe chronic obstructive lung disease exists (percutaneous subclavian placement only). • There has been past irradiation of prospective insertion site. • There have been previous episodes of venous thrombosis or vascular surgical procedures at the prospective placement site. • There are local tissue factors that may prevent proper device stabilization and/or access.

Warnings: When using alcohol or alcohol containing antiseptics with polyurethane catheters, care should be taken to avoid prolonged or excessive contact. Solutions should be allowed to completely dry before applying an occlusive dressing. Chlorhexidine gluconate are the suggested antiseptics to use. • Alcohol should not be used to soak or declot polyurethane catheters because alcohol is known to degrade polyurethane catheters over time with repeated and prolonged exposure. • Acetone and polyethylene glycol containing ointments should not be used with polyurethane catheters, as they may damage the device. • Intended for Single Patient Use. DO NOT REUSE. This device is a single use device and must never be reimplanted. Reuse carries with it the attendant concern of cross-infection regardless of the cleaning or sterilization method. Resterilization of incompletely cleaned devices may not be effective. Any device that has been contaminated by blood must not be reused or re-sterilized. • This device is not intended for pediatric or neonatal use. • After use, this product may be a potential biohazard. Handle and discard in accordance with accepted medical practice and applicable local, state, and federal laws and regulations. • This is not a right atrium catheter. Avoid positioning the catheter tip in the right atrium. Placement or migration of the catheter tip into the right atrium may cause cardiac arrhythmia, myocardial erosion or cardiac tamponade. • When the dilator and guidewire are withdrawn from the sheath, place a finger over the sheath opening to minimize blood loss and risk of air aspiration. The risk of air embolism is reduced by performing this part of the procedure with the patient performing the Valsalva maneuver or by attaching a syringe or end cap to the dilator to reduce blood flow while trimming the catheter. • Do not use the catheter if there is any evidence of mechanical damage or leaking. Damage to the catheter may lead to rupture, fragmentation, possible embolism, and surgical removal. • If signs of extravasation exist, discontinue injections. Begin appropriate medical intervention immediately. • The fluid level in the catheter will drop if the catheter connector is held above the level of the patient's heart and opened to air. To help prevent a drop in the fluid level (allowing air entry) while changing end caps, hold the connector below the level of the patient's heart before removing the end cap. • You should not feel any resistance when withdrawing the catheter from the vein. If you do encounter resistance, this may indicate that the catheter is being pinched between the clavicle and first rib (the "Pinch-off" sign). Do not continue pulling against resistance as this may cause catheter breakage and embolism. Free up the resistance (e.g. by repositioning the patient) before proceeding further. • If the artery is entered, withdraw the needle and apply manual pressure for several minutes. If the pleural space is entered, withdraw the needle and evaluate patient for possible pneumothorax. • Failure to warm contrast media to body temperature prior to power-injection may result in catheter failure. • Failure to ensure patency of the catheter prior to power-injection studies may result in catheter failure. • Power-injector machine pressure limiting feature may not prevent over pressurization of an occluded catheter. • Exceeding the maximum flow rate of 5mL/ sec may result in catheter failure and/or catheter tip displacement. • Attaching the small lumens of the triple lumen catheter to the barbed end of the tunneling tool may cause catheter damage. • Use of Lumens not marked "Power-injectable" for power inection of contrast media may cause failure of the catheter. • Central venous pressure monitoring should always be used in conjuction with other patient assessment metrics when evaluating cardiac function. • PowerLine* catheter indication for power-injection of contrast media implies the catheter's ability to withstand the procedure, but does not imply appropriateness of the procedure for a particular patient. A suitably trained clinician is responsible for evaluating the health status of a patient as it pertains to a power-injection procedure • Pinch-off Prevention: Catheters placed percutaneously or through a cut-down, into the subclavian vein, should be inserted at the junction of the outer and middle thirds of the clavicle, lateral to the thoracic outlet. The catheter should not be inserted into the subclavian vein medially, because such placement can lead to compression of the catheter between the first rib and the clavicle, which can cause damage and even severance of the catheter. A radiographic confirmation of catheter placement should be made to ensure that the catheter is not being pinched by the first rib and clavicle.[1,2]

Precautions: Carefully read and follow all instructions prior to use. • Federal (U.S.A.) law restricts this device to sale by or on the order of a physician. • Only qualified healthcare practitioners should insert, manipulate, and remove this catheter. • When tunneling, the catheter must not be forced. • Avoid inadvertent puncture of the skin or fascia with the tip of the tunneler. • Do not insert guidewire beyond the bevel of the needle while removing straightener from the needle hub in order to prevent guidewire damage or shearing. • If the guidewire must be withdrawn while the needle is inserted, remove both the needle and guidewire as a unit to help prevent the needle from damaging or shearing the guidewire. • Do not grasp the catheter with any instrument that might sever or damage the catheter. • Do not cut the catheter before removal from vein to avoid catheter embolism. • The catheter must be secured in place to minimize the risk of catheter breakage and embolization. • Only medical practitioners licensed by law, trained and experienced in proper positioning of catheters in the central venous system using percutaneous entry (Seldinger technique) should place this catheter. • Follow Universal Precautions when inserting and maintaining the catheter. • Follow all contraindications, warnings, cautions, precautions, and instructions for all infusates including contrast media as specified by its manufacturer. • Use aseptic techniques whenever the catheter lumen is opened or connected to other devices. • Catheters can be cut to length if a different length is desired due to patient size and desired point of insertion according to hospital protocol. Catheter depth markings are in centimeters. Use caution when using scissors or any sharp-edged instruments as they could damage the catheter. Do not cut the stylet. • Use aseptic techniques whenever the catheter lumen is opened or connected to other devices. Povidone-iodine or chlorhexadine gluconate are the suggested antiseptics to use with this device and components. Acetone and tincture of iodine should not be used because they could adversely affect the performance of the catheter and connectors. 10% acetone/70% isopropyl alcohol swabsticks used for dressing changes should not adversely affect the catheter. Prior to Placement • Examine the package carefully before opening to confirm its integrity and that the expiration date has not passed. The catheter is supplied in a sterile package and is non-pyrogenic. Do not use if package is damaged, opened or the expiration date has passed. Sterilized by ethylene oxide. Do not resterilize. • Inspect kit for presence of all components. • Fill (prime) the device with sterile heparinized saline or normal saline solution to help avoid air embolism. • When using an introducer kit, verify that the catheter fits easily through the introducer sheath. During Placement • Avoid accidental device contact with sharp instruments and mechanical damage to the catheter material. Use only smooth-edged, atraumatic clamps or forceps. • Avoid perforating, tearing or fracturing the catheter when using a guidewire. • Do not use the catheter if there is any evidence of mechanical damage or leaking. • Avoid sharp or acute angles during implantation which could compromise the patency of the catheter lumen(s). • Sutures should not be tied around the catheter itself. The provided suture wings will secure the catheter without compromising catheter patency. When using percutaneous introducers: - Carefully insert the introducer and catheter to avoid inadvertent penetration to vital structures in the thorax. - To avoid blood vessel damage, do not allow the percutaneous introducer sheath to remain indwelling in the blood vessel without the internal support of a catheter or dilator. - Simultaneously advance the sheath and dilator with rotational motion to help prevent sheath damage. After Placement • Do not use the catheter if there is any evidence of mechanical damage or leaking. Damage to the catheter may lead to rupture, fragmentation and possible embolism and surgical removal. • Accessories and components used in conjunction with this device should incorporate luer lock connections. • If signs of extravasation exist, discontinue injections. Begin appropriate medical intervention immediately. • Prolonged infusion pressure greater than 25 psi (172 kPa) may damage blood vessels and viscus and is not recommended. Do not use a syringe smaller than 10 mL. • Exceeding the maximum flow rate of 5 mL/sec may result in catheter failure and/or catheter tip displacement.

Possible Complications : The potential exists for serious complications including the following: • Air Embolism • Bleeding • Brachial Plexus Injury • Cardiac Arrhythmia • Cardiac Tamponade • Catheter or Cuff Erosion Through the Skin • Catheter Embolism • Catheter Occlusion • Catheter Occlusion, Damage or Breakage due to Compression between the Clavicle and First Rib (Pinch-off) • Catheter-related Sepsis • Endocarditis • Exit Site Infection • Exit Site Necrosis • Extravasation • Fibrin Sheath Formation • Hematoma • Hemothroax • Hydrothorax • Intolerance Reaction to Implanted Device • Laceration of Vessels or Viscus • Myocardial Erosion • Perforation of Vessels or Viscus • Phlebitis • Pneumothorax • Spontaneous Catheter Tip Malposition or Retraction • Thromboembolism • Thoracic Duct Injury • Venous Thrombosis • Ventricular Thrombosis • Vessel Erosion • Risks Normally Associated with Local or General Anesthesia, Surgery, and Post- Operative Recovery.

Please consult package inserts for more detailed safety information and instructions for use.

References:

1. Aitken, D.R. and Minton, J.P. "The Pinch-Off Sign: A Subclavian Catheters", American Journal of Surgery, Vol. 148, Nov. 1984, pp. 633-636.
2. Rubenstein, R.B., Alberty, R.E., et al. "Hickman® Catheter Separation", JPEN, Vol. 9, No. 6, Nov./Dec. 1985, pp. 754-757.

PowerHickman™ Central Venous Catheter

Indications for Use: The PowerHickman™ catheter is indicated for short or long-term access to the central venous system. PowerHickman™ catheters are designed for the administration of I.V. fluids, blood products, drugs, parenteral nutrition solutions, as well as blood withdrawal, power-injection of contrast media and allows for central venous pressure monitoring. The maximum recommended infusion rate is 5 mL/sec for power-injection of contrast media. For central venous pressure monitoring, it is recommended that catheter lumen of 20 Gauge or larger be used.

Contraindications: The device is contraindicated whenever: • The presence of device related infection, bacteremia, or septicemia is known or suspected. • The patient's body size is insufficient to accommodate the size of the implanted device. • The patient is known or is suspected to be allergic to materials contained in the device. • Severe chronic obstructive lung disease exists (percutaneous subclavian placement only). • There has been past irradiation of prospective insertion site. • There have been previous episodes of venous thrombosis or vascular surgical procedures at the prospective placement site. • There are local tissue factors that may prevent proper device stabilization and/or access.

Warnings: When using alcohol or alcohol containing antiseptics with polyurethane catheters, care should be taken to avoid prolonged or excessive contact. Solutions should be allowed to completely dry before applying an occlusive dressing. Chlorhexidine gluconate are the suggested antiseptics to use. • Alcohol should not be used to soak or declot polyurethane catheters because alcohol is known to degrade polyurethane catheters over time with repeated and prolonged exposure. • Acetone and polyethylene glycol containing ointments should not be used with polyurethane catheters, as they may damage the device. • Intended for Single Patient Use. DO NOT REUSE. Bard Access Systems products are single use devices and must never be re-implanted. Reuse carries with it the attendant concern of cross-infection regardless of the cleaning or sterilization method. Resterilization of incompletely cleaned devices may not be effective. Any device that has been contaminated by blood must not be reused or re-sterilized. • After use, this product may be a potential biohazard. Handle and discard in accordance with accepted medical practice and applicable local, state, and federal laws and regulations. • This is not a right atrium catheter. Avoid positioning the catheter tip in the right atrium. Placement or migration of the catheter tip into the right atrium may cause cardiac arrhythmia, myocardial erosion or cardiac tamponade. • When the dilator and guidewire are withdrawn from the sheath, place a finger over the sheath opening to minimize blood loss and risk of air aspiration. The risk of air embolism is reduced by performing this part of the procedure with the patient performing the Valsalva maneuver or by attaching a syringe or end cap to the dilator to reduce blood flow while trimming the catheter. • Do not use the catheter if there is any evidence of mechanical damage or leaking. Damage to the catheter may lead to rupture, fragmentation, possible embolism, and surgical removal. • If signs of extravasation exist, discontinue injections. Begin appropriate medical intervention immediately. • The fluid level in the catheter will drop if the catheter connector is held above the level of the patient's heart and opened to air. To help prevent a drop in the fluid level (allowing air entry) while changing end caps, hold the connector below the level of the patient's heart before removing the end cap. • You should not feel any resistance when withdrawing the catheter from the vein. If you do encounter resistance, this may indicate that the catheter is being pinched between the clavicle and first rib (the "Pinch-off" sign). Do not continue pulling against resistance as this may cause catheter breakage and embolism. Free up the resistance (e.g. by repositioning the patient) before proceeding further. • If the artery is entered, withdraw the needle and apply manual pressure for several minutes. If the pleural space is entered, withdraw the needle and evaluate patient for possible pneumothorax. • Failure to warm contrast media to body temperature prior to power-injection may result in catheter failure. • Failure to ensure patency of the catheter prior to power-injection studies may result in catheter failure. • Power-injector machine pressure limiting feature may not prevent over pressurization of an occluded catheter, which may lead to catheter failure. • Exceeding the maximum flow rate of 5 mL/sec, and the maximum pressure of power-injectors of 300 psi, may result in catheter failure and/or catheter tip displacement. • PowerHickman® catheter indication for power-injection of contrast media implies the catheter's ability to withstand the procedure, but does not imply appropriateness of the procedure for a particular patient. A suitably trained clinician is responsible for evaluating the health status of a patient as it pertains to a power-injection procedure. • Pinch-off Prevention: Catheters placed percutaneously or through a cut-down, into the subclavian vein, should be inserted at the junction of the outer and middle thirds of the clavicle, lateral to the thoracic outlet. The catheter should not be inserted into the subclavian vein medially, because such placement can lead to compression of the catheter between the first rib and the clavicle, which can cause damage and even severance of the catheter. A radiographic confirmation of catheter placement should be made to ensure that the catheter is not being pinched by the first rib and clavicle.[1,2] • Place a finger over the needle to minimize blood loss and risk of air aspiration. The risk of air aspiration is reduced by performing this part of the procedure with the patient holding their breath until the guidewire is inserted.

Precautions: Carefully read and follow all instructions prior to use. • Federal (U.S.A.) law restricts this device to sale by or on the order of a physician. • Only qualified healthcare practitioners should insert, manipulate, and remove this catheter. • When tunneling, the catheter must not be forced. • When inserting the catheter via a subclavian approach, maintain a horizontal trajectory when introducing the needle beneath the clavicle. Vertical needle passage may increase the risk of pneumothorax. • If an artery is entered, withdraw the needle and apply manual pressure for several minutes. If the pleural space is entered, withdraw needle and observe patient for signs of pneumothorax. • Avoid inadvertent puncture of the skin or fascia with the tip of the tunneler. • Do not insert guidewire beyond the bevel of the needle while removing straightener from the needle hub in order to prevent guidewire damage or shearing. • If the guidewire must be withdrawn while the needle is inserted, remove both the needle and guidewire as a unit to help prevent the needle from damaging or shearing the guidewire. • Do not attempt to slide the catheter over the wire separately into the vein. This may cause the catheter to bunch up on the wire making advancement of the catheter into the vessel more difficult. • Contrast media should be warmed before power-injection. • Do not grasp the catheter with any instrument that might sever or damage the catheter. • Do not cut the catheter before removal from vein to avoid catheter embolism. • The catheter must be secured in place to minimize the risk of catheter breakage and embolization. • Only medical practitioners licensed by law, trained and experienced in proper positioning of catheters in the central venous system using percutaneous entry (Seldinger technique) should place this catheter. • Follow Universal Precautions when inserting and maintaining the catheter. • Follow all contraindications, warnings, cautions, precautions, and instructions for all infusates including contrast media as specified by its manufacturer. • Catheters can be cut to length if a different length is desired due to patient size and desired point of insertion according to hospital protocol. Catheter depth markings are in centimeters. Use caution when using scissors or any sharp-edged instruments as they could damage the catheter. • Use aseptic techniques whenever the catheter lumen is opened or connected to other devices. Povidone-iodine or chlorhexadine gluconate are the suggested antiseptics to use with this device and components. Acetone and tincture of iodine should not be used because they could adversely affect the performance of the catheter and connectors. 10% acetone/70% isopropyl alcohol swabsticks used for dressing changes should not adversely affect the catheter. • Patients with thick muscular chest walls or extensive scar tissue may require the use of a percutaneous introducer for catheter insertion. Guidewires packaged in the PowerHickman® kits are not intended for over-the-wire procedures. • Examine the package carefully before opening to confirm its integrity and that the expiration date has not passed. The catheter is supplied in a sterile package and is non-pyrogenic. Do not use if package is damaged, opened or the expiration date has passed. Sterilized by ethylene oxide. Do not resterilize. • Fill (prime) the device with sterile heparinized saline or normal saline solution to help avoid air embolism. • Check catheter for leaking or mechanical damage. • Avoid accidental device contact with sharp instruments and mechanical damage to the catheter material. Use only smoothedged, atraumatic clamps or forceps. • Avoid perforating, tearing or fracturing the catheter when using a guidewire. • Do not use the catheter if there is any evidence of mechanical damage or leaking. • Avoid sharp or acute angles during implantation which could compromise the patency of the catheter lumen(s). • Sutures should not be tied around the catheter itself. The provided suture wings will secure the catheter without compromising catheter patency. • When using percutaneous introducers: - Carefully insert the introducer and catheter to avoid inadvertent penetration to vital structures in the thorax. - To avoid blood vessel damage, do not allow the percutaneous introducer sheath to remain indwelling in the blood vessel without the internal support of a catheter or dilator. - Simultaneously advance the sheath and dilator with rotational motion to help prevent sheath damage. • Do not use the catheter if there is any evidence of mechanical damage or leaking. Damage to the catheter may lead to rupture, fragmentation and possible embolism and surgical removal. • Accessories and components used in conjunction with this device should incorporate luer lock connections. • If signs of extravasation exist, discontinue injections. Begin appropriate medical intervention immediately. • Prolonged infusion pressure greater than 25 psi (172 kPa) may damage blood vessels and viscus and is not recommended. Do not use a syringe smaller than 10 mL!

Possible Complications: The potential exists for serious complications including the following: Air Embolism • Bleeding • Brachial Plexus Injury • Cardiac Arrhythmia • Cardiac Tamponade • Catheter or Cuff Erosion Through the Skin • Catheter Embolism • Catheter Occlusion • Catheter Occlusion, Damage or Breakage due to Compression between the Clavicle and First Rib (Pinch-off) • Catheter-related Sepsis • Endocarditis • Exit Site Infection • Exit Site Necrosis • Extravasation • Fibrin Sheath Formation • Hematoma • Hemothorax • Hydrothorax • Intolerance Reaction to Implanted Device • Laceration of Vessels or Viscus • Myocardial Erosion • Perforation of Vessels or Viscus • Phlebitis • Pneumothorax • Spontaneous Catheter Tip Malposition or Retraction • Thromboembolism • Thoracic Duct Injury • Venous Thrombosis • Ventricular Thrombosis • Vessel Erosion • Risks Normally Associated with Local or General Anesthesia, Surgery, and Post- Operative Recovery.

Please consult package inserts for more detailed safety information and instructions for use.

References:

1. Aitken, D.R. and Minton, J.P. "The Pinch-Off Sign: A Subclavian Catheters", American Journal of Surgery, Vol. 148, Nov. 1984, pp. 633-636.
2. Rubenstein, R.B., Alberty, R.E., et al. "Hickman® Catheter Separation", JPEN, Vol. 9, No. 6, Nov./Dec. 1985, pp. 754-757.

Groshong™ Central Venous Catheter

Indications For Use: Groshong™ Long-Term Catheters are designed for long-term vascular access and for use in patients that lack adequate peripheral venous access. They are available in single lumen and multi-lumen catheters. All Groshong™ central venous catheters are designed for the administration of I.V. fluids, blood products, drugs, and parenteral nutrition solutions, as well as blood withdrawal.

Contraindications: The device is contraindicated whenever: • The presence of device related infection, bacteremia, or septicemia is known or suspected. • The patient's body size is insufficient to accommodate the size of the implanted device. • The patient is known or is suspected to be allergic to materials contained in the device. • Severe chronic obstructive lung disease exists (percutaneous subclavian placement only.) • Past irradiation of prospective insertion site. • Previous episodes of venous thrombosis or vascular surgical procedures at the prospective placement site. • Local tissue factors will prevent proper device stabilization and/or access.

Warnings: Intended for Single Patient Use. DO NOT REUSE. Bard Access Systems products are single use devices and should never be reimplanted. Reuse carries with it the attendant concern of cross-infection regardless of the cleaning or sterilization method. Resterilization of incompletely cleaned devices may not be effective. Any device that has been contaminated by blood should not be reused or resterilized. After use, this product may be a potential biohazard. Handle and discard in accordance with accepted medical practice and applicable local, state and federal laws and regulations. • Pinch-off Prevention: Catheters placed percutaneously or through a cut-down, into the subclavian vein, should be inserted at the junction of the outer and middle thirds of the clavicle, lateral to the thoracic outlet. The catheter should not be inserted into the subclavian vein medially, because such placement can lead to compression of the catheter between the first rib and the clavicle, which can cause damage and even severance of the catheter. A radiographic confirmation of catheter placement should be made to ensure that the catheter is not being pinched by the first rib and clavicle.[1,2]

Cautions: Carefully read and follow all instructions prior to use. • Federal (U.S.A.) law restricts this device to sale by or on the order of a physician. • Only qualified healthcare practitioners should insert, manipulate and remove these devices.

Precautions: Follow Universal Precautions when inserting and maintaining the catheter. Follow all contraindications, warnings, cautions, precautions and instructions for all infusates as specified by its manufacturer. Use aseptic techniques whenever the catheter lumen is opened or connected to other devices. Povidone-iodine is the suggested antiseptic to use with this device and components. Acetone and tincture of iodine should not be used because they could adversely affect the performance of the catheter and connectors. 10% acetone/70% isopropyl alcohol swabsticks used for dressing changes should not adversely affect the catheter. • Examine package carefully before opening to confirm its integrity and that the expiration date has not passed. The device is supplied in a double sterile package and is non-pyrogenic. Do not use if package is damaged, opened or the expiration date has passed. Sterilized by ethylene oxide. Do not Resterilize. • Fill (prime) the device with normal saline solution to help avoid air embolism. • Avoid accidental device contact with sharp instruments and mechanical damage to the catheter material. Use only smoothedged atraumatic clamps or forceps. • Avoid perforating, tearing or fracturing the catheter when using a guidewire. • Do not use the catheter if there is any evidence of mechanical damage or leaking. • Avoid sharp or acute angles during implantation which could compromise the patency of the catheter lumen(s). • Use suture wings to secure catheters. • Do not place sutures directly around the catheter.

Possible Complications: The use of an indwelling central venous catheter provides an important means of venous access for critically ill patients; however, the potential exists for serious complications including the following: • Air Embolism • Bleeding • Brachial Plexus Injury • Cardiac Arrhythmia • Cardiac Tamponade • Catheter or Cuff Erosion Through Skin • Catheter Embolism • Catheter or Cuff Occlusion • Catheter Occlusion, Damage or Breakage due to Compression Between the Clavicle and First Rib • Catheter-related Sepsis • Endocarditis • Exit Site Infection • Exit Site Necrosis • Extravasation • Fibrin Sheath Formation • Hematoma • Hemothorax • Hydrothorax • Intolerance Reaction to Implanted Device • Laceration of Vessels or Viscus • Perforation of Vessels or Viscus • Pneumothorax • Spontaneous Catheter Tip Malposition or Retraction • Thoracic Duct Injury • Thromboembolism • Venous Thrombosis • Ventricular Thrombosis • Vessel Erosion • Risks Normally Associated with Local and General Anesthesia, Surgery, and Post-Operative Recovery These and other complications are well documented in medical literature and should be carefully considered before placing the catheter.

Please consult package inserts for more detailed safety information and instructions for use.

References:

1. Aitken, D.R. and Minton, J.P. "The Pinch-Off Sign: A Subclavian Catheters", American Journal of Surgery, Vol. 148, Nov. 1984, pp. 633-636.
2. Rubenstein, R.B., Alberty, R.E., et al. "Hickman™ Catheter Separation", JPEN, Vol. 9, No. 6, Nov./Dec. 1985, pp. 754-757.

Hickman™, Leonard™, and Broviac™ Central Venous Catheters

Indications For Use: Hickman™, Leonard™ and Broviac™ are designed for longterm vascular access and for use in patients that lack adequate peripheral venous access. They are available in single, dual and triple lumen catheters. All Hickman™, Leonard™ and Broviac™ central venous catheters are designed for the administration of I.V. fluids, blood products, drugs, and parenteral nutrition solutions, as well as blood withdrawal. Note: While smaller lumen Broviac™ catheters have been used successfully for blood withdrawal, their small lumen sizes increase the chance of clotting. Contraindications, Warnings, Cautions and Precautions Contraindications The device is contraindicated whenever: • The presence of device related infection, bacteremia, or septicemia is known or suspected. • The patient's body size is insufficient to accommodate the size of the implanted device. • The patient is known or is suspected to be allergic to materials contained in the device. • Severe chronic obstructive lung disease exists (percutaneous subclavian placement only.) • Past irradiation of prospective insertion site. • Previous episodes of venous thrombosis or vascular surgical procedures at the prospective placement site. • Local tissue factors will prevent proper device stabilization and/or access.

Warnings: Intended for Single Patient Use. DO NOT REUSE. Bard Access Systems products are single use devices and should never be reimplanted. Reuse carries with it the attendant concern of cross-infection regardless of the cleaning or sterilization method. Resterilization of incompletely cleaned devices may not be effective. Any device that has been contaminated by blood should not be reused or resterilized. • This is not a right atrium catheter. Avoid positioning the catheter tip in the right atrium. Placement or migration of the catheter tip into the right atrium may cause cardiac arrhythmia, myocardial erosion or cardiac tamponade. The risk of these potential complications may be more likely in neonatal patients. • Avoid vessel perforation. Hold thumb over exposed orifice of sheath to prevent air aspiration. The risk of air aspiration is reduced by performing this part of the procedure with the patient performing the Valsalva maneuver. • You should not feel any resistance when withdrawing the catheter from the vein. If you do encounter resistance, this may indicate that the catheter is being pinched between the clavicle and first rib (the "pinch-off" sign). Do not continue pulling against resistance as this may cause catheter breakage and embolism. Free up the resistance (e.g. by repositioning the patient) before proceeding further. • After use, this product may be a potential biohazard. Handle and discard in accordance with accepted medical practice and applicable local, state and federal laws and regulations. • If the artery is entered, withdraw the needle and apply manual pressure for several minutes. If the pleural space is entered, withdraw the needle and evaluate patient for possible pneumothorax. • Pinch-off Prevention: Catheters placed percutaneously or through a cut-down, into the subclavian vein, should be inserted at the junction of the outer and middle thirds of the clavicle, lateral to the thoracic outlet. The catheter should not be inserted into the subclavian vein medially, because such placement can lead to compression of the catheter between the first rib and the clavicle, which can cause damage and even severance of the catheter. A radiographic confirmation of catheter placement should be made to ensure that the catheter is not being pinched by the first rib and clavicle.[1,2]

Cautions: Carefully read and follow all instructions prior to use. • Federal (U.S.A.) law restricts this device to sale by or on the order of a physician. • Only qualified healthcare practitioners should insert, manipulate and remove these devices. • When tunneling, the catheter must not be forced. • Avoid inadvertent puncture of the skin or fascia with the tip of the tunneler. • Do not insert guidewire beyond the bevel of the needle while removing straightener from the needle hub in order to prevent guidewire damage or shearing. If the guidewire must be withdrawn while the needle is inserted, remove both the needle and guidewire as a unit to help prevent the needle from damaging or shearing the guidewire. • Do not grasp the catheter with any instrument that might sever or damage the catheter. • Do not cut the catheter before removal from vein to avoid catheter embolism. • Do not use scissors or any sharp-edged instruments as they could damage the catheter.

Precautions: Follow Universal Precautions when inserting and maintaining the catheter. • Follow all contraindications, warnings, cautions, precautions and instructions for all infusates as specified by its manufacturer. • Use aseptic techniques whenever the catheter lumen is opened or connected to other devices. Povidone-iodine is the suggested antiseptic to use with this device and components. Acetone and tincture of iodine should not be used because they could adversely affect the performance of the catheter and connectors. 10% acetone/ 70% isopropyl alcohol swabsticks used for dressing changes should not adversely affect the catheter. • Examine package carefully before opening to confirm its integrity and that the expiration date has not passed. The device is supplied in a double sterile package and is non-pyrogenic. Do not use if package is damaged, opened or the expiration date has passed. Sterilized by ethylene oxide. Do not Resterilize. • Fill (prime) the device with sterile heparinized saline or normal saline solution to help avoid air embolism. • Avoid accidental device contact with sharp instruments and mechanical damage to the catheter material. Use only smoothedged atraumatic clamps or forceps. • Avoid perforating, tearing or fracturing the catheter when using a guidewire. • Do not use the catheter if there is any evidence of mechanical damage or leaking. • Avoid sharp or acute angles during implantation which could compromise the patency of the catheter lumen(s). • If sutures are used to secure the catheter, make sure they do not occlude or cut the catheter. • When using percutaneous introducers: - Carefully insert the introducer and catheter to avoid inadvertent penetration to vital structures in the thorax. - To avoid blood vessel damage, do not allow the percutaneous introducer sheath to remain indwelling in the blood vessel without the internal support of a catheter or dilator. - Simultaneously advance the sheath and dilator with rotational motion to help prevent sheath damage. • Do not use the catheter if there is any evidence of mechanical damage or leaking. Damage to the catheter may lead to rupture, fragmentation and possible embolism and surgical removal. • Accessories and components used in conjunction with this device should incorporate Luer lock connections. • If signs of extravasation exist, discontinue injections. Begin appropriate medical intervention immediately. • Infusion pressure greater than 25 psi (172 kPa) may damage blood vessels and viscus and is not recommended. DO NOT USE A SYRINGE SMALLER THAN 10 mL!

Possible Complications: The use of an indwelling central venous catheter provides an important means of venous access for critically ill patients; however, the potential exists for serious complications including the following: These and other complications are well documented in medical literature and should be carefully considered before placing the catheter. • Air Embolism • Bleeding • Brachial Plexus Injury • Cardiac Arrhythmia • Cardiac Tamponade • Catheter or Cuff Erosion Through Skin • Catheter Embolism • Catheter or Cuff Occlusion • Catheter Occlusion, Damage or Breakage due to Compression Between the Clavicle and First Rib • Catheter-related Sepsis • Endocarditis • Exit Site Infection • Exit Site Necrosis • Extravasation • Fibrin Sheath Formation • Hematoma • Hemothorax • Hydrothorax • Intolerance Reaction to Implanted Device • Laceration of Vessels or Viscus • Myocardial Erosion • Perforation of Vessels or Viscus • Pneumothorax • Spontaneous Catheter Tip Malposition or Retraction • Thoracic Duct Injury • Thromboembolism • Venous Thrombosis • Ventricular Thrombosis • Vessel Erosion • Risks Normally Associated with Local and General Anesthesia, Surgery, and Post-Operative Recovery.

Please consult package inserts for more detailed safety information and instructions for use.

References

1. Aitken, D.R. and Minton, J.P. "The Pinch-Off Sign: A Subclavian Catheters", American Journal of Surgery, Vol. 148, Nov. 1984, pp. 633-636.
2. Rubenstein, R.B., Alberty, R.E., et al. "Hickman™ Catheter Separation", JPEN, Vol. 9, No. 6, Nov./Dec. 1985, pp. 754-757.