

# ARROW ENDURANCE™

## Extended Dwell Peripheral Catheter System

Rx only.

### Product Description:

The ARROW Endurance™ catheter system is a sterile, single use peripheral intravascular device designed to permit access to the peripheral vascular system. The insertion device consists of an ergonomically designed handle with an integral echogenic needle that contains a passively-activated needle protection mechanism, guidewire with slider advancer, catheter release tab, and single-lumen catheter (refer to Figure 1). The insertion device is designed to allow the user to intuitively advance the guidewire and release the catheter with minimal insertion steps. The catheter is advanced over the needle and threaded over a guidewire into a peripheral vessel.

Throughout catheter insertion, blood is contained within the device to aid in prevention of blood exposure. The catheter system consists of a translucent radiopaque polyurethane catheter, a needle with openings to enhance flashback visibility, a seal in the catheter hub designed to reduce blood exposure, a stabilization platform with a strain relief nose designed to reduce kinking at the hub of the catheter, extension tubing with Luer hub, a vent plug, and a clamp.

The catheter is intended for short-term use to permit delivery of infusion therapies, infusion of blood and blood products, pressure monitoring, high pressure injection at a maximum of 325 psi, and withdrawal of blood.

The catheter system may be used for any patient population with consideration given to adequacy of vascular anatomy and appropriateness of the procedure.

### Indications:

The ARROW Endurance™ catheter system permits access to the patient's peripheral vascular system for short-term use to sample blood, monitor blood pressure, or administer fluids. The catheter may be used for high pressure injection. The safety feature is intended to minimize the risk of sharps injuries.

### Contraindications:

None known.

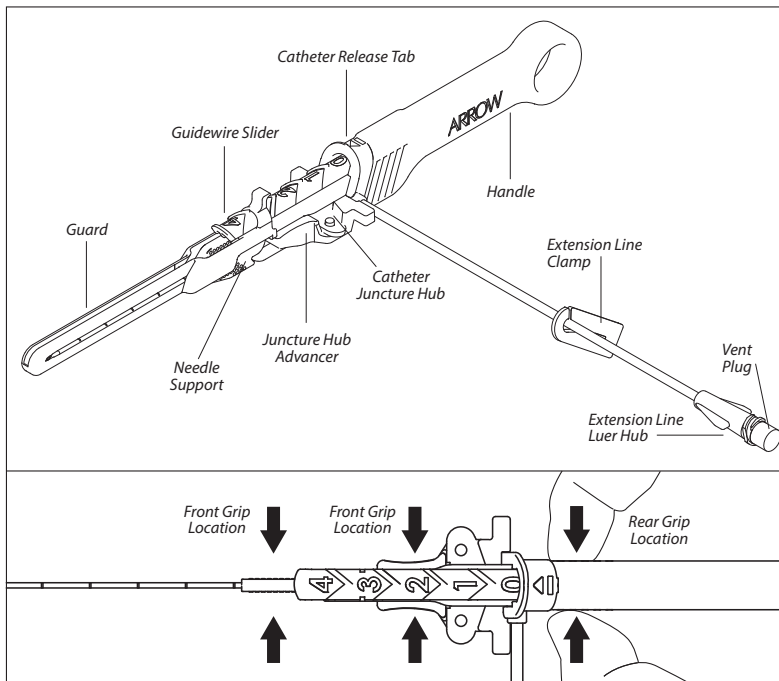


Figure 1  
1

## **General Warnings and Cautions**

### **Warnings:**

1. Sterile, Single use: Do not reuse, reprocess or resterilize. Reuse of device creates a potential risk of serious injury and/or infection which may lead to death.
2. Read all package insert warnings, precautions and instructions prior to use. Failure to do so may result in severe patient injury or death.
3. To minimize the risk of air embolism and blood loss associated with disconnects use only securely tightened Luer-Lock connections.

### **Cautions:**

1. Do not alter the catheter, guidewire, or any other kit/set component during insertion, use, or removal.
2. Procedure must be performed by trained personnel well versed in anatomical landmarks, safe technique, and potential complications.
3. Some disinfectants used at catheter insertion site contain solvents which can weaken the catheter material. Alcohol, acetone, and polyethylene glycol can weaken the structure of polyurethane materials. These agents may also weaken the adhesive bond between catheter stabilization device and skin.
  - Do not use acetone on catheter surface.
  - Do not use alcohol to soak catheter surface or allow alcohol to dwell in a catheter lumen to restore catheter patency or as an infection prevention measure.
  - Do not use polyethylene glycol containing ointments at insertion site.
  - Take care when infusing drugs with a high concentration of alcohol.
  - Allow insertion site to dry completely prior to applying dressing.
4. Indwelling catheter should be routinely inspected for desired patency, security of dressing, and possible migration.
5. Do not use syringes smaller than 3 mL to flush or infuse to reduce risk of catheter damage.

## **Venous Use Warnings**

### **Warnings:**

1. Practitioners must be aware of complications associated with peripheral venous catheterization including but not limited to: phlebitis, thrombophlebitis, venous thrombosis, occlusion, infiltration, catheter embolus, septicemia, inadvertent arterial puncture, nerve injury, hematoma, air embolism, site infection, and cellulitis.
2. Therapies not appropriate for administration via a peripheral vein include vesicants, known irritants, parenteral nutrition solutions, drug/solutions with pH <5 and >9 or >600 mOsm/L.

## **Arterial Use Warnings**

### **Warnings:**

1. Practitioners must be aware of complications associated with arterial catheterization including but not limited to: septicemia, vessel wall perforation, intravascular thrombosis and embolization, hematoma, arterial spasm, tissue necrosis, hemorrhage, peripheral ischemia and infarction, peripheral nerve injury, air embolism, site infection, and cellulitis.

2. Practitioners must ascertain that definite evidence of adequate collateral ulnar flow exists prior to radial artery catheterization.
3. In brachial artery catheterization, collateral flow cannot be guaranteed. Therefore, intravascular thrombosis can compromise circulation and result in patient injury.
4. Accidental infusions of drugs or therapeutics or pressure injection into an arterial system may result in severe patient injury or death.

## **Pressure Injection Warnings and Cautions**

### **Warnings:**

1. Assess each patient for appropriateness of a pressure injection procedure.
2. Pressure injection procedures must be performed by trained personnel well versed in safe technique and potential complications.
3. Do not pressure inject if catheter is placed into an artery. Pressure injection into an artery may result in severe patient injury or death.
4. Ensure catheter patency prior to pressure injection to reduce risk of catheter failure and/or patient complications. Inability to obtain brisk blood return or to flush easily indicates a possible problem with the catheter and catheter should not be used.
5. Avoid kinking or obstructing the catheter system during pressure injection to reduce risk of catheter failure.
6. Discontinue pressure injection at first sign of infiltration/extravasation.

### **Cautions:**

1. Do not exceed maximum pressure limit of 325 psi on high pressure injector equipment or catheter's maximum recommended flow rate for corresponding injectate viscosity to reduce risk of catheter failure.
2. Pressure limit settings on high pressure injector equipment may not prevent over-pressurizing an occluded or partially occluded catheter, which may cause catheter failure.
3. Follow the contrast media manufacturer's specified instructions for use, contraindications, warnings, and precautions.
4. The single flow rate on venous placement label is the maximum recommended flow rate for high pressure injection using injectate of 11.8 centipoise (cP) viscosity. For higher viscosity media or a high pressure injector setting lower than 325 psi, this flow rate may not be achievable.
5. Due to variations in add-on devices, tubing, injectate temperature and pressure limit settings, the maximum pressure injection flow rates may not be achievable.

Kits/Sets may not contain all accessory components detailed in these instructions for use. Become familiar with instructions for individual component(s) before beginning the procedure.

## Insertion Instructions

### A Suggested Procedure: Use Sterile Technique.

#### Prepare for Insertion:

1. Select most appropriate insertion site.
  - Use of ultrasound has been shown to increase success with catheter placement. For upper arm insertion ultrasound is recommended.
  - Selecting a vessel with an appropriate subcutaneous depth optimizes the success of peripheral catheter placement.
2. Prep and drape anticipated insertion site per institutional policies and procedures.
3. Administer local anesthetic per institutional policies and procedures.
  - A Protected Needle/Safety Needle should be used in accordance with manufacturer's instructions for use.
4. Check that extension line clamp is not engaged and vent plug is secure (refer to Figure 1).
5. Remove needle guard (refer to Figure 2).

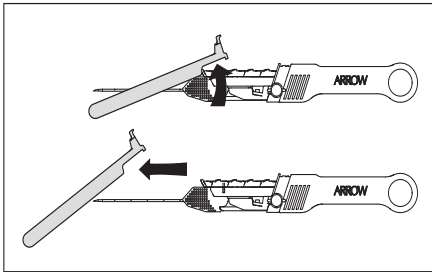


Figure 2

6. Prepare catheter by loosening catheter tip and seal adhesion. This is achieved by:
  - Retract the guidewire slider to the 2 cm mark (refer to Figure 3).
  - Advance the catheter forward approximately 3 mm (refer to Figure 3).

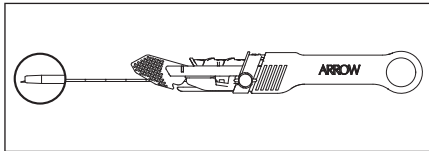


Figure 3

- Return catheter to its original position making sure juncture hub and catheter release tab fit tightly together and the distal tip of catheter is retracted past needle bevel (refer to Figure 4).
- Advance the guidewire slider back to its original position making sure the "0" mark on the slider is visible. This will withdraw the guidewire into the device and return the needle support to its original position (refer to Figure 4).

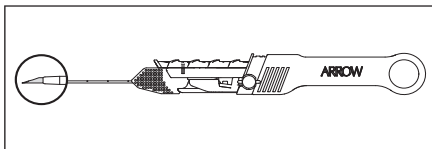


Figure 4

**⚠ Caution:** Prior to insertion, distal tip of catheter must be fully retracted past needle bevel or catheter tip damage may occur (refer to Figure 4).

**⚠ Caution:** Prior to insertion, guidewire must be fully retracted into needle or blood flashback may be inhibited.

**NOTE:** Priming catheter prior to insertion may reduce or impede blood flashback.

#### Insert Catheter System:

7. Access chosen vessel using a continuous, controlled, slow, forward motion. Observe blood flashback through the catheter.
  - When appropriate, utilizing lower insertion angles during vessel access optimizes the success of peripheral catheter placement.
  - Optionally, front grip locations (refer to Figure 1) may be utilized. If utilized, switch to rear grip location prior to catheter advancement.

**NOTE:** Rate of blood flashback may slow at catheter hub before flowing to the extension line. Blood flashback indicates part of the needle bevel is in the vessel.

8. Carefully advance an additional 1 mm to ensure bevel is fully seated within vessel (refer to Figure 5).

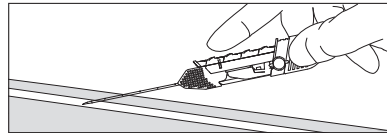


Figure 5

9. Stabilize position of needle/handle and carefully advance guidewire into vessel by pulling guidewire slider back into handle (refer to Figure 6).
  - The guidewire slider has centimeter markings to indicate how far the guidewire is advanced past bevel of needle. When guidewire slider has the "0" mark covered by the device, tip of guidewire is positioned at needle tip.

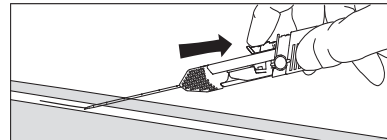


Figure 6

**⚠ Caution:** Do not advance guidewire unless the needle is confirmed to be in the vessel.

**⚠ Caution:** Do not force guidewire if resistance is encountered during advancement.

**⚠ Caution:** Blood flashback may slow or stop upon guidewire advancement.

10. Fully advance guidewire. Guidewire should advance smoothly without resistance.

**⚠ Warning:** Do not retract guidewire through needle while in vessel to reduce risk of guidewire damage and embolization. If it is necessary to withdraw guidewire once deployed, needle and guidewire should be removed as a unit.

11. While firmly holding device needle/handle stationary, advance catheter over guidewire into vessel with the opposite hand (refer to Figure 8). Advance catheter using a continuous, controlled, slow, forward motion. Catheter should advance smoothly without resistance.

- Optionally, the catheter release tab may be utilized to initiate catheter advancement. Push forward on catheter release tab to advance catheter over needle bevel (refer to Figure 7). The catheter release tab has a stop at 1 cm; at this point the needle bevel will be covered by the catheter.

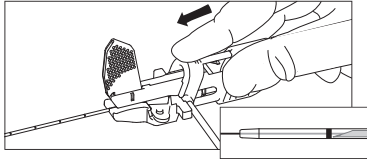


Figure 7

- ⚠ Caution: Do not attempt to force catheter release tab past the stopping point.**
- Optionally maintain needle/handle stability by anchoring hand while advancing catheter with opposite hand.
  - Centimeter markings on catheter body indicate length of catheter inserted.

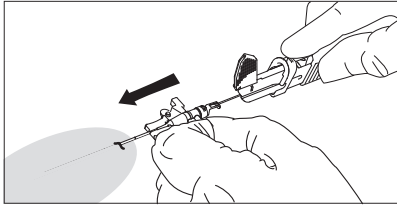


Figure 8

- ⚠ Caution: Always keep needle/handle stationary while threading catheter. Do not retract needle/handle while threading catheter. Failure to keep needle/handle stationary may prevent catheter from threading into vessel.**

- ⚠ Caution: Do not force catheter if resistance is encountered during advancement.**

12. Fully advance catheter until the junction hub advancer nose is against the insertion site.
  - Junction hub advancer remains with catheter during advancement and will be removed prior to securement/dressing.
  - The final mark on the catheter should be against the insertion site. This allows 5 mm between insertion site and nose of catheter junction hub which facilitates dressing.
13. Hold catheter stationary by grasping catheter junction hub with one hand. With the other hand, withdraw needle/guidewire out of catheter.
  - The needle protection assembly will remain attached to proximal end of catheter hub until needle protection is activated. Visually confirm needle tip is enclosed in the needle protection (refer to Figure 9).

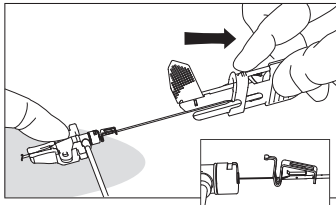


Figure 9

- ⚠ Caution: Do not attempt to advance needle back into catheter after catheter is partially threaded off needle to reduce risk of catheter damage.**

- ⚠ Warning: If resistance is met, do not apply excessive force in removing the needle/guidewire. Remove system as a unit.**

- ⚠ Caution: Do not attempt to remove needle protection assembly from needle.**

### Complete Insertion:

14. Upon removal of needle/handle, ensure guidewire is intact. Slowly retract guidewire into needle for disposal.
  - When guidewire slider has the "0" mark covered by the device, tip of guidewire should be positioned at needle tip.
15. Remove junction hub advancer from catheter by gently lifting up on the catheter while holding the junction hub advancer (refer to Figure 10). Once disengaged, remove junction hub advancer and discard.

- ⚠ Caution: Do not raise the catheter beyond 90° relative to the skin to avoid catheter kinking and damage.**

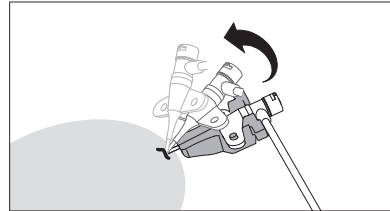


Figure 10

16. Engage extension line clamp and remove the vent plug from catheter extension line Luer hub, attach a 10 mL syringe filled with normal saline for injection, unclamp and check for brisk free-flowing blood return, flush, and reengage extension line clamp.
  - Inability to obtain blood return and/or flush indicates catheter is not in place.
17. Remove syringe and attach needleless connector or stopcock and flush per institutional policies and procedures.

### Secure Catheter:

18. Secure catheter and dress according to institutional policies and procedures. Ensure all external portions of the catheter except for extension line are completely under the dressing.
  - Attach supplied venous or arterial placement label to extension line to indicate whether the catheter is in a vein or artery.

- ⚠ Warning: After insertion, use supplied labels to distinguish if the catheter was placed into a vein or an artery. Failure to do so creates a potential risk of catheter misuse which may result in severe patient injury or death.**

- ⚠ Caution: Do not apply tape, staples, or sutures directly to the catheter body to reduce risk of damaging catheter, impeding catheter flow, or adversely affecting monitoring capabilities. Secure only at indicated stabilization locations.**

- ⚠ Caution: Avoid placement or securement in an area of flexion.**

- ⚠ Caution: Avoid kinking when securing catheter to patient.**

- ⚠ Caution: Minimize catheter manipulation throughout procedure to maintain proper catheter tip position.**

### Catheter Stabilization Device (where provided):

A catheter stabilization device should be used in accordance with manufacturer's instructions for use.

19. Document insertion procedure.

- ⚠ Caution: Never attempt to insert a needle or a blunt cannula into the seal in back of catheter hub (refer to Figure 11).**

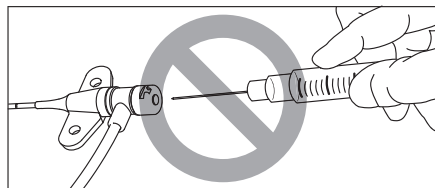


Figure 11

## Care and Maintenance:

### Dressing:

Dress according to institutional policies, procedures, and practice guidelines. Change immediately if the integrity becomes compromised (i.e., dressing becomes damp, soiled, loosened or no longer occlusive).

### Catheter Patency:

Maintain catheter patency according to institutional policies, procedures and practice guidelines. All personnel who care for patients with peripheral intravascular devices must be knowledgeable about effective management to prolong catheter's dwell time and prevent injury.

## Pressure Injection Instructions

Pressure injection information on product labeling provides assistance in making catheter-related decisions when pressure injecting with ARROW Endurance Extended Dwell Peripheral Catheter. The ARROW Endurance catheter's indication for high pressure injection implies the catheter's ability to withstand the procedure, but does not imply appropriateness of the procedure for a particular patient.

### Use sterile technique.

1. Inspect catheter site and catheter to ensure there are no signs and/or symptoms of phlebitis, erythema or tenderness at site. Ensure that there are no kinks or bends in the catheter body and that the dressing is clean, dry and intact.
2. Remove needleless connector from extension line Luer hub if required. It may be acceptable to pressure inject through specifically labeled needleless connectors - refer to the needleless connector manufacturer's instructions for use.
3. Check for patency:
  - Attach a 10 mL syringe filled with normal saline for injection.
  - Flush catheter gently.
  - Check for brisk free-flowing blood return.
  - Vigorously flush catheter.

**⚠ Warning: Ensure catheter patency prior to pressure injection to reduce risk of catheter failure and/or patient complications. Inability to obtain brisk blood return or to flush easily indicates a possible problem with the catheter and catheter should not be used.**

4. Detach syringe.
5. Attach pressure injection administration set tubing to extension line Luer hub according to manufacturer's recommendations.

**⚠ Caution: Do not exceed maximum pressure limit of 325 psi on high pressure injector equipment or catheter's maximum recommended flow rate for corresponding injectate viscosity to reduce risk of catheter failure.**

6. Inject contrast media in accordance with institutional policies and procedures.

**⚠ Caution: Follow the contrast media manufacturer's specified instructions for use, contraindications, warnings, and precautions.**

7. Disconnect catheter from high pressure injector equipment.
8. Flush catheter using a 10 mL syringe filled with normal saline for injection.
9. Disconnect syringe and replace sterile needleless connector, as required, on catheter extension line Luer hub and flush per institutional policies and procedures.

## Catheter Removal Instructions:

### Use aseptic technique per institutional policies and procedures.

1. Remove dressing.

**⚠ Warning: Do not use scissors to remove dressing to reduce the risk of cutting the catheter.**

2. Remove catheter securement device or sutures being careful not to cut catheter.
3. Remove catheter slowly.

**⚠ Warning: Do not use excessive force in removing catheter. If resistance is met on removal, stop and follow institutional policies and procedures for difficult to remove catheters.**

4. Apply pressure using a gauze pad at site after catheter is removed per institutional policies and procedures.
5. Cover site with a sterile occlusive dressing.
6. Document catheter removal procedure including confirmation that entire catheter length has been removed per institutional policies and procedures.

## Catheter Specification Testing Details














Refer to product labeling for catheter specifications. The following section explains how some catheter specifications were generated.

- Priming volumes are approximate and are done via direct connection to catheter hub (no needleless connector).
- Gravity flow rates were determined using room temperature water at 100 cm head height and represent approximate flow capabilities.
- Pump flow rates are determined at pump pressure of 10 psig and represent approximate flow capabilities.
- Maximum pressure injection flow rate is the maximum indicated flow rate for high pressure injection. Pressure injection flow rates are determined at injector pressure limit setting of 325 psi maximum, with 152 cm administration set tubing, and using injectate viscosities as identified on labeling.

For reference information concerning patient assessment, clinical education, potential complications, and specific techniques for this procedure, consult standard textbooks, medical literature, and Arrow International, Inc. website: [www.teleflex.com](http://www.teleflex.com)

en

Symbol Glossary

								
Caution	Consult instructions for use	Do not reuse	Do not resterilize	Sterilized by ethylene oxide	Keep away from sunlight	Keep dry	Do not use if package is damaged	Not made with natural rubber latex
								
Catalogue number	Lot number	Use by	Manufacturer					

*Teleflex, the Teleflex logo, Arrow, the Arrow logo and ARROW Endurance are trademarks or registered trademarks of Teleflex Incorporated or its affiliates, in the U.S. and/or other countries. © 2017 Teleflex Incorporated. All rights reserved.*

**Arrow International, Inc.**

Subsidiary of Teleflex Incorporated

2400 Bernville Road | Reading, PA 19605 USA

1-800-523-8446 | 1-610-378-0131

**Teleflex®**