

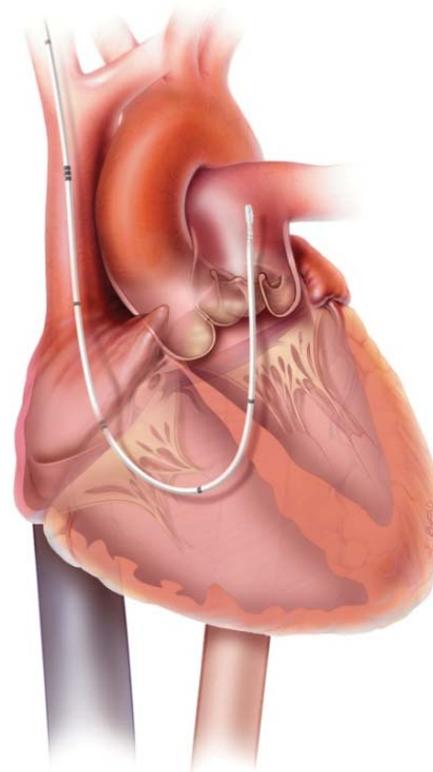
# EndoVent pulmonary catheter



**Edwards**

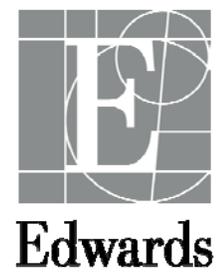
## Outline

- Overview
- Preparing for catheter placement
- Utilizing the catheter
- Troubleshooting



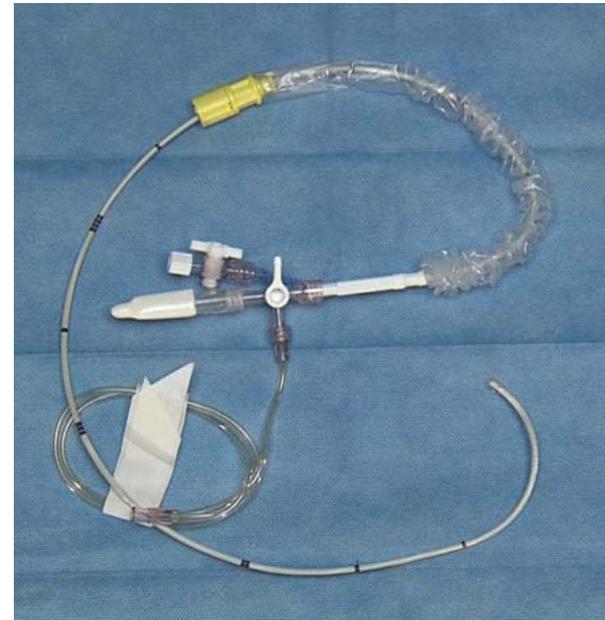


# Overview



## Overview

- For use with patients undergoing cardiopulmonary bypass
  - Removes blood from the pulmonary artery
  - Assists in decompressing the heart
  - Designed to maintain a dry operative field
  - Monitors pulmonary artery pressure



## Overview

- Description
  - Double lumen, 8.3 Fr catheter
  - 5 cm interval markings to assist with placement
  - Preshaped and flexible
  - Integrated balloon to flow-direct the catheter into the pulmonary artery
  - Protected by a contamination guard
  - 3-way stopcock allows for pulmonary artery pressure monitoring
- Additional contents
  - 9 Fr catheter introducer sheath
  - 1.5 ml syringe





## Preparing for catheter placement



Edwards

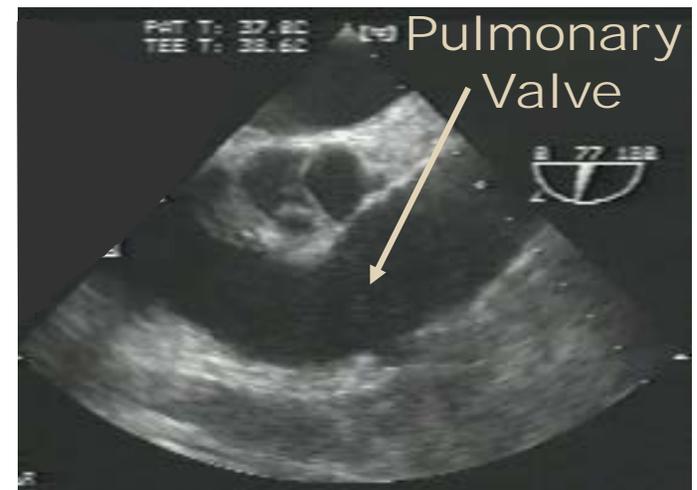
## Preparing for catheter placement

- Ensure O.R. is equipped with a fluoroscopy and/or transesophageal echo (TEE) unit
- Position all monitors for simultaneous viewing
  - Hemodynamic monitor
  - Fluoroscopy
  - Transesophageal echo



## Preparing for catheter placement

- Transesophageal echo (TEE) views used for placement
  - Bicaval view
  - 4 chamber view
  - RV inflow outflow view
  - Pulmonary outflow tract view
    - Shows catheter going through pulmonic valve and into main PA trunk
    - Advance TEE probe between 60 and 90 degrees
    - Verify placement



Pulmonary outflow tract view

## Preparing for catheter placement

- Visually examine the EndoVent pulmonary catheter
  - Do not use if device shows signs of damage or if package is damaged or open
- Prep the catheter
  - According to the product's IFU
  - For a visual demonstration view the EndoVent pulmonary catheter product prep video
- Insert a vacuum relief valve into a ¼ inch (0.64 cm) vent line
  - Near the perfusionist's roller pump or on the sterile field
  - At least 60 cm from the heart and preferably level with the heart
  - Within view and reach of the surgical team

## Preparing for catheter placement

- Using standard sterile technique, place the included 9 Fr catheter introducer sheath into the internal jugular or subclavian vein
  - Use of a catheter introducer sheath other than the 9 Fr kit provided with the EndoVent catheter may result in incompatibility with the contamination guard fittings, compromised flow through the catheter introducer sheath side port, and catheter insertion resistance
- Per hospital protocol, administer appropriate anticoagulant therapy to patient prior to EndoVent catheter use
  - Failure to administer anticoagulants may result in formation of thrombus on or within the catheter



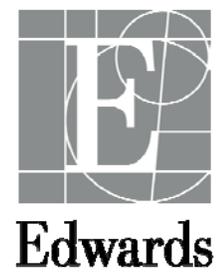
## Preparing for catheter placement

- Attach the fully primed pressure transducer line from the port on the 3-way stopcock of the EndoVent catheter to a transducer for monitoring the pressure during placement as well as pulmonary artery pressure





## Utilizing the catheter



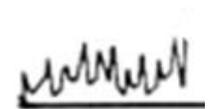
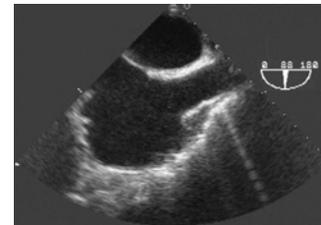
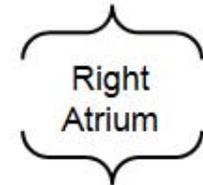
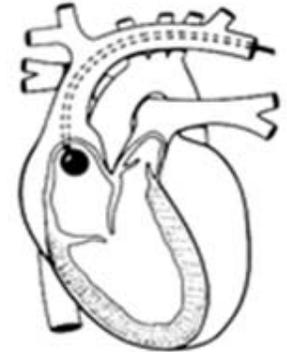
## Placing the EndoVent pulmonary catheter

- Ensure the EndoVent catheter balloon is fully deflated
- Insert the EndoVent catheter into the 9 Fr catheter introducer sheath
  - Align curve of the EndoVent catheter with the curve of the right ventricular outflow tract
- Connect the EndoVent pulmonary catheter contamination guard to the catheter introducer sheath



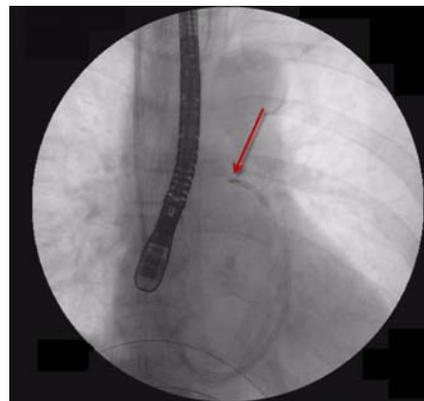
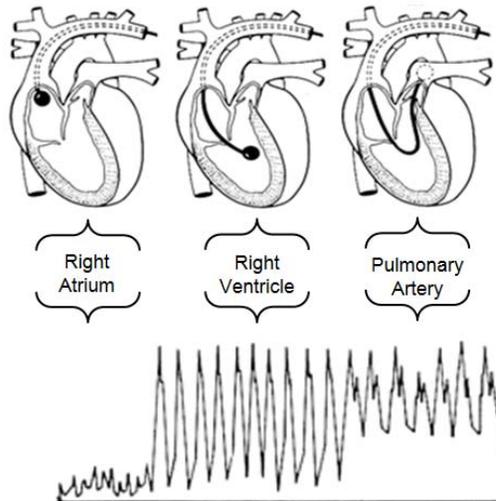
## Placing the EndoVent pulmonary catheter

- Position the catheter tip in the right atrium
- Inflate balloon using 1.5 ml air or carbon dioxide
  - If resistance to inflation is encountered, deflate the balloon and re-evaluate catheter position
  - Never inflate the balloon with liquid as this may cause an inability to fully inflate or deflate the balloon
  - Inflate with bacteria filtered carbon dioxide in any situation where balloon rupture may result in an air embolism in the arterial circulation (e.g. any patient who may have right to left intra-cardiac or intra-pulmonary shunts)



## Placing the EndoVent pulmonary catheter

- Under pressure waveform monitoring, fluoroscopic and/or TEE guidance
  - Float and advance the EndoVent catheter
  - Position the catheter tip in the main pulmonary artery, between the pulmonic valve and before the bifurcation of the pulmonary artery



## Placing the EndoVent pulmonary catheter

- Deflate the balloon once proper placement of the catheter is confirmed
  - With the 1.5 mL syringe, draw back twice to create a vacuum
  - Close the stopcock to the balloon lumen
  - Avoid prolonged inflation while the catheter is in the wedge position as this may be an occlusive maneuver and may result in pulmonary infarction
- Aspirate and flush the EndoVent pulmonary catheter
  - Aspirate using the 3-way stopcock on the venting lumen
  - Flush with saline and close the stopcock to the venting lumen



## Placing the EndoVent pulmonary catheter

- If not done previously, connect the EndoVent pulmonary catheter contamination guard to the catheter introducer sheath
- Secure the EndoVent catheter in place
  - Rotate the twist lock of the contamination guard in the “|” position
  - To unsecure, rotate the twist lock to the “0” position
- Once placed in the body, the EndoVent catheter should be manipulated only while observed with fluoroscopy, TEE, and/or while monitoring pressure at the catheter tip



## Connect the venting line

- Attach the EndoVent catheter to the corresponding venting line from the cardiopulmonary bypass pump
  - The venting line must have a vacuum release valve between the patient and bypass pump as previously described
  - Overly vigorous venting without a vacuum release valve may cause injury to the patient



## Venting

- Monitor EndoVent catheter flow
  - Initial flow up to 250 mL/min
  - Maintenance phase flow < 40 mL/min
- When not actively venting or monitoring pulmonary artery pressure, keep the venting lumen stopcock closed to the venting lumen



## Withdrawing the EndoVent pulmonary catheter

- Prior to withdrawing the catheter, ensure the balloon is fully deflated
  - With the 1.5 mL syringe, draw back twice to create a vacuum
  - Close the stopcock to the balloon lumen
- Once the balloon is deflated, remove the catheter while monitoring EKG and hemodynamic monitor
- Remove the EndoVent pulmonary catheter prior to, or simultaneously with, the reversal of anti-coagulation





# Troubleshooting



**Edwards**

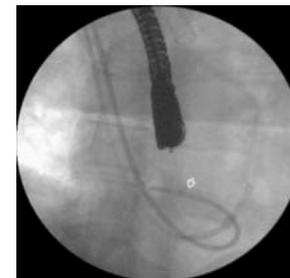
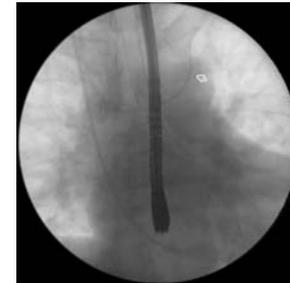
## Troubleshooting

- **Difficulty advancing the catheter through the hemostatic valve of the introducer**
  - Confirm use of the 9 Fr catheter introducer sheath provided with the EndoVent catheter
  - Flush the catheter while advancing through the valve
  - Hold the catheter distally so it does not bend or buckle while being advanced through the valve



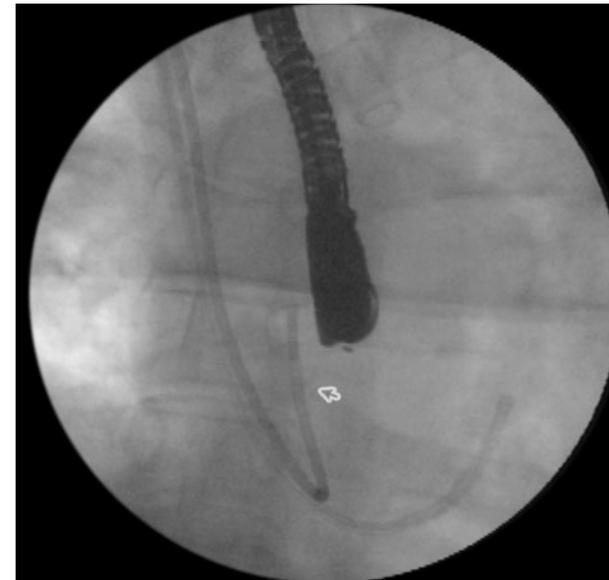
## Troubleshooting

- **Catheter in left innominate vein**
  - Withdraw catheter, turn and re-advance following IFU
- **Catheter curling in right atrium**
  - Validate balloon inflation
  - Follow right outflow tract on TEE or fluoroscopy
  - Withdraw and re-advance as needed following IFU
- **Catheter curling in right ventricle**
  - Validate balloon inflation
  - Follow right outflow tract on TEE or fluoroscopy
  - Withdraw and re-advance as needed following IFU



## Troubleshooting

- **Catheter does not pass from the right atrium to the right ventricle**
  - It may be necessary to gently withdraw and rotate catheter to change the position of the tip
- **Resistance to balloon inflation**
  - Deflate balloon and re-evaluate catheter position
    - Verify catheter tip is in the main pulmonary artery, between the pulmonic valve and before the bifurcation of the pulmonary artery
  - Confirm stopcock is open to balloon lumen



## Troubleshooting

- **Excessive flow through the vent**
  - Recall flow guidelines for the EndoVent catheter
    - Normal initial flow: up to 250 mL/min
    - Normal maintenance flow: < 40 mL/min
  - Re-evaluate venous cannula placement
  - Confirm adequate right heart decompression
- **Inadequate vent drainage**
  - Recall flow guidelines for the EndoVent catheter
    - Normal initial flow: up to 250 mL/min
    - Normal maintenance flow: < 40 mL/min
  - Check stopcock positioning
  - Confirm catheter tip is placed in PA; distal positioning may result in poor drainage
  - Assess RV and PA collapse with TEE views



## Troubleshooting

- **Resistance felt when removing EndoVent catheter through introducer sheath**
  - Do not exert excessive force
  - Verify balloon is fully deflated and the stopcock is closed to the balloon lumen
  - If necessary, position the fluoroscope over the heart and then remove the EndoVent catheter and introducer sheath as one unit to prevent catheter damage or patient injury
  - Confirm the catheter was not inadvertently sutured in place



# Thank you

**CAUTION: Federal (United States) law restricts this device to sale by or on the order of a physician. See instructions for use for full prescribing information, including indications, contraindications, warnings, precautions and adverse events.**

Proper surgical procedures and techniques are the responsibility of the medical profession. Described procedures are provided for informational purposes only. Each physician must determine the appropriate use of this device for each patient based on medical training, experience, the type of procedure employed, and the benefits and risks associated with device use.

Edwards, Edwards Lifesciences, the stylized E logo, and EndoVent are trademarks of Edwards Lifesciences Corporation or its affiliates. All other trademarks are the property of their respective owners.

© 2017 Edwards Lifesciences Corporation. All rights reserved. PP--US-1589 v1.0

Edwards Lifesciences • One Edwards Way, Irvine CA 92614 USA • [edwards.com](http://edwards.com)



**Edwards**



Edwards