



# Doppler and ECG in Tip Positioning

ARROW® VPS G4™ Device

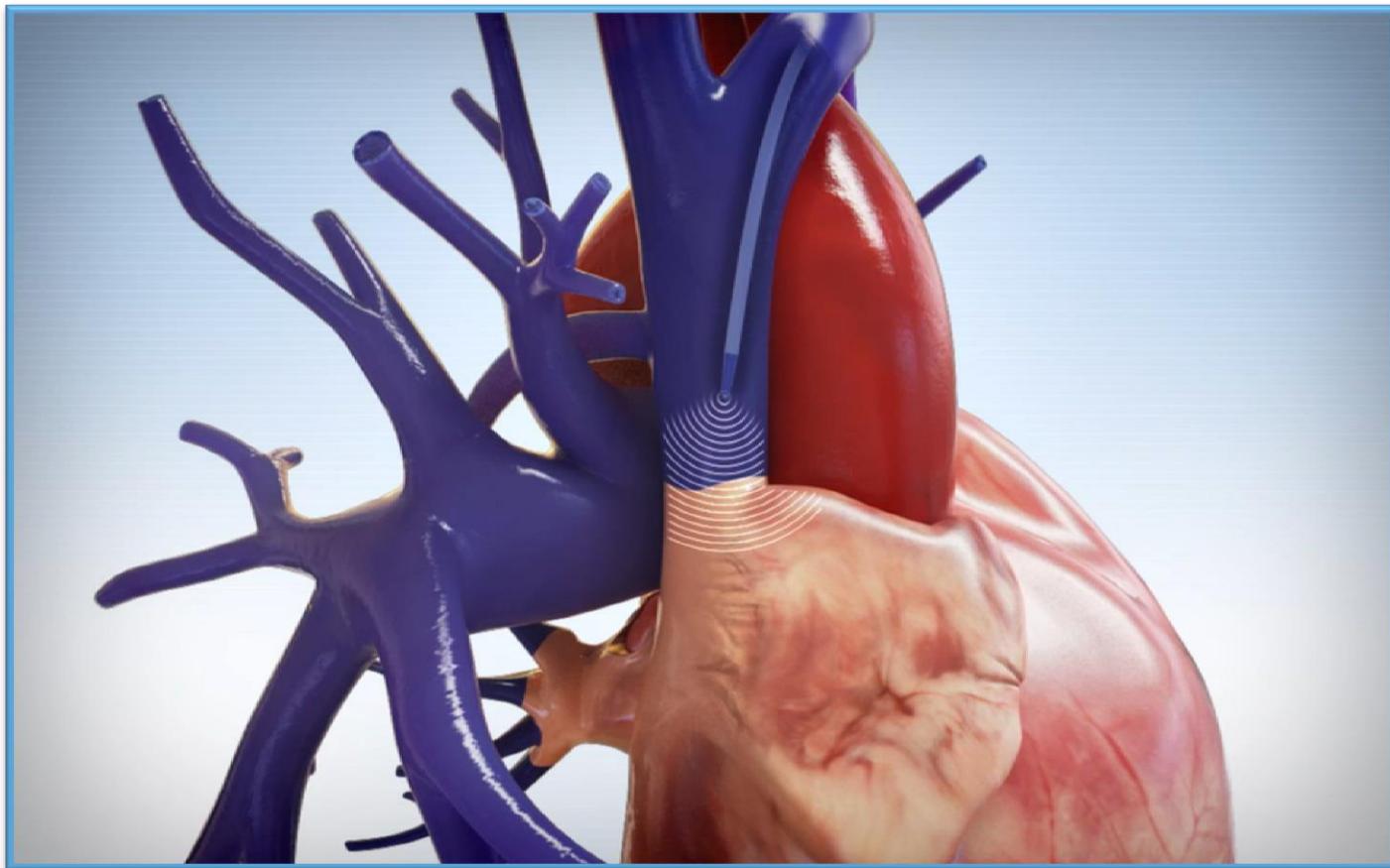
## Objectives

---

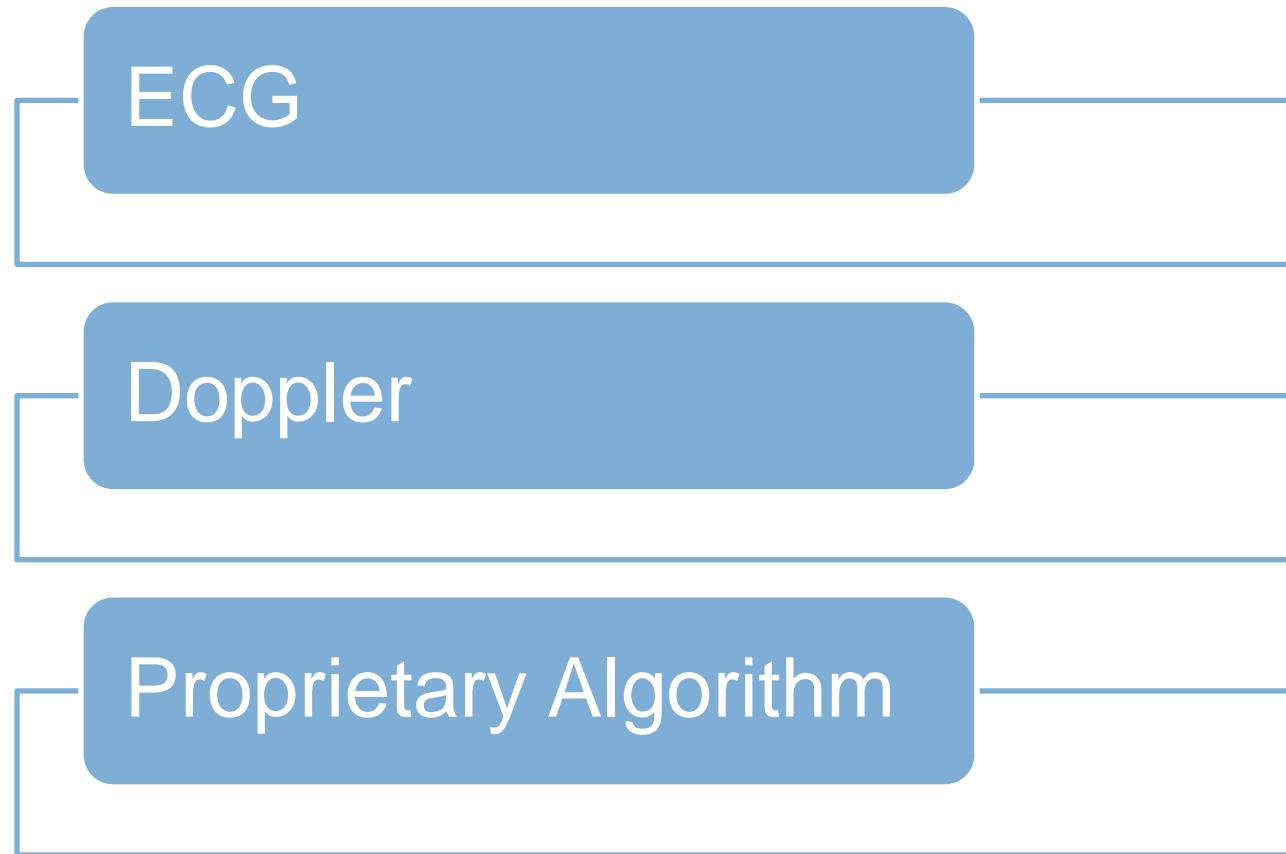
- The clinician will:
  - have working knowledge of all vectors when using the ARROW® VPS G4™ Device to place central line at the lower 1/3 SVC-CAJ

## ARROW® VPS G4™ Device

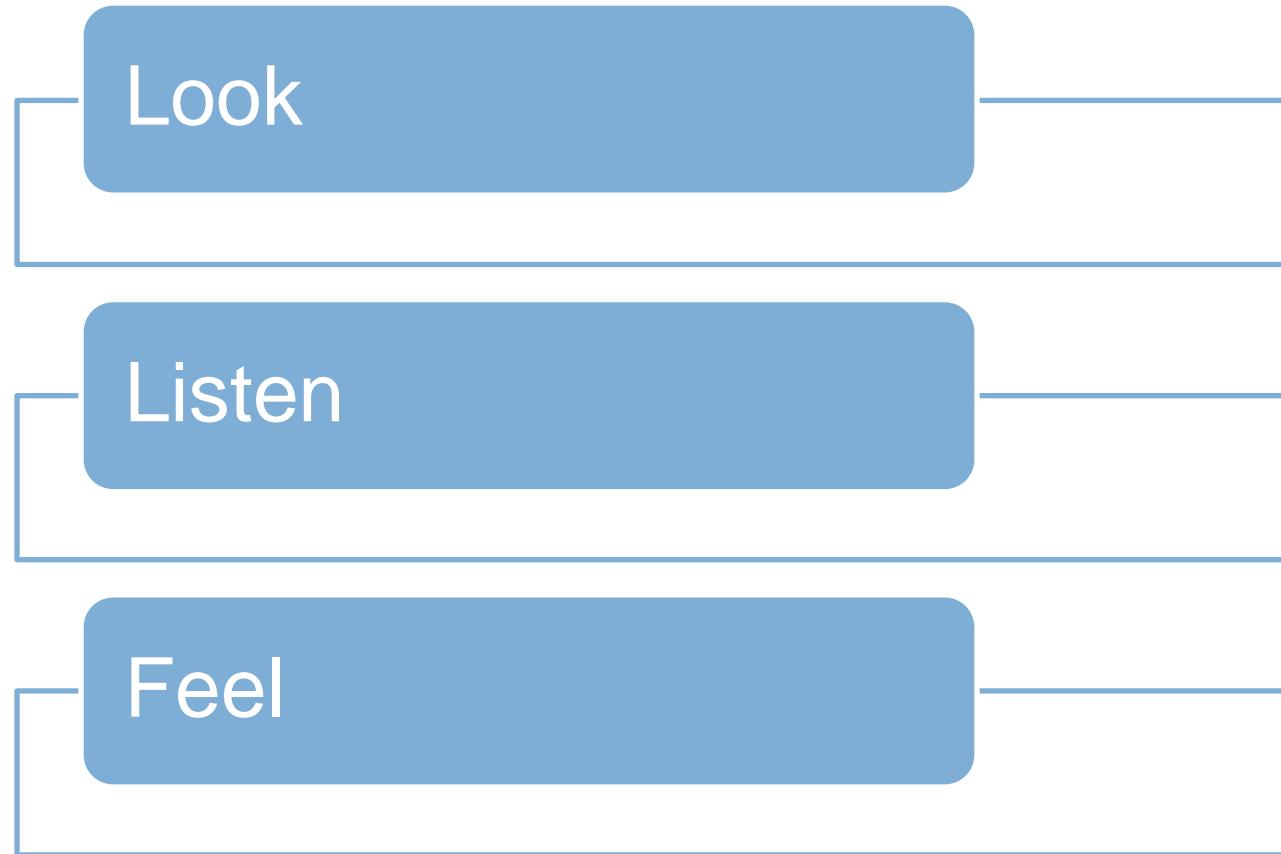
The ARROW® VPS G4™ Device uses intravascular ECG, Doppler, and a proprietary algorithm to determine navigational symbols



Mutually dependent to obtain a steady Blue Bullseye

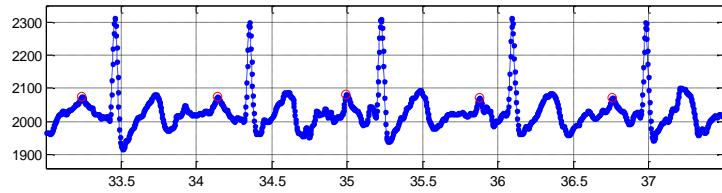


Mutually dependent to obtain a steady Blue Bullseye

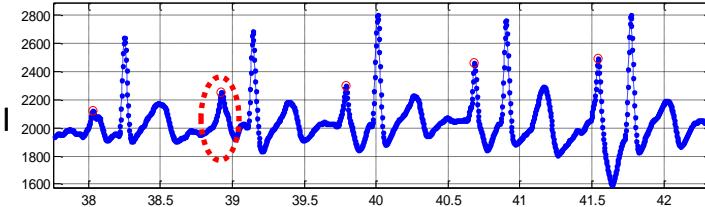


# ECG P-wave Spike

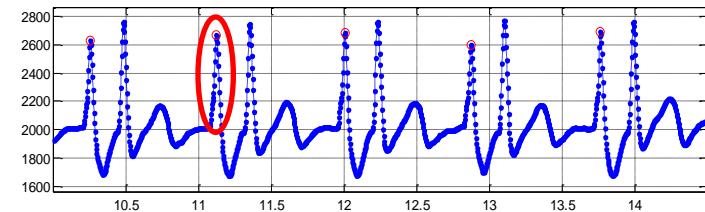
External ECG



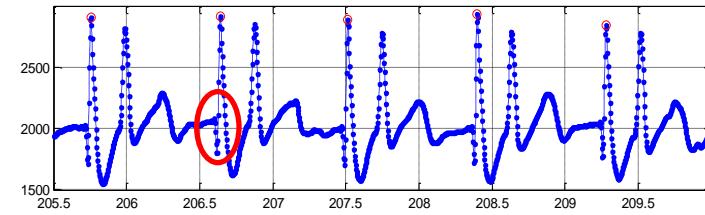
Same patient  
intravascular lead II



In CAJ

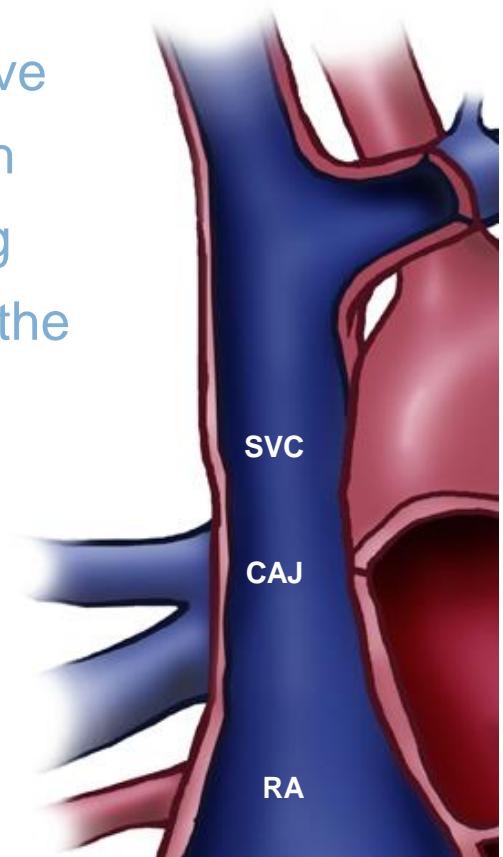


In Right Atrium

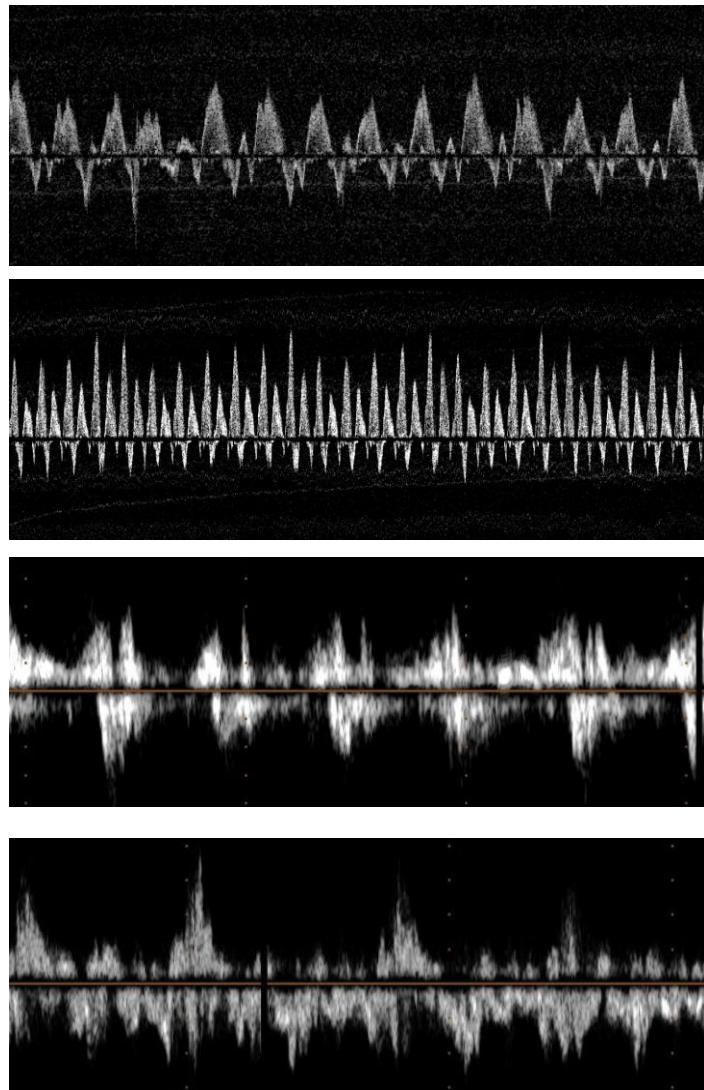


Atrial P-wave  
grows with  
increasing  
proximity to the

RA



# Doppler Flow Signatures

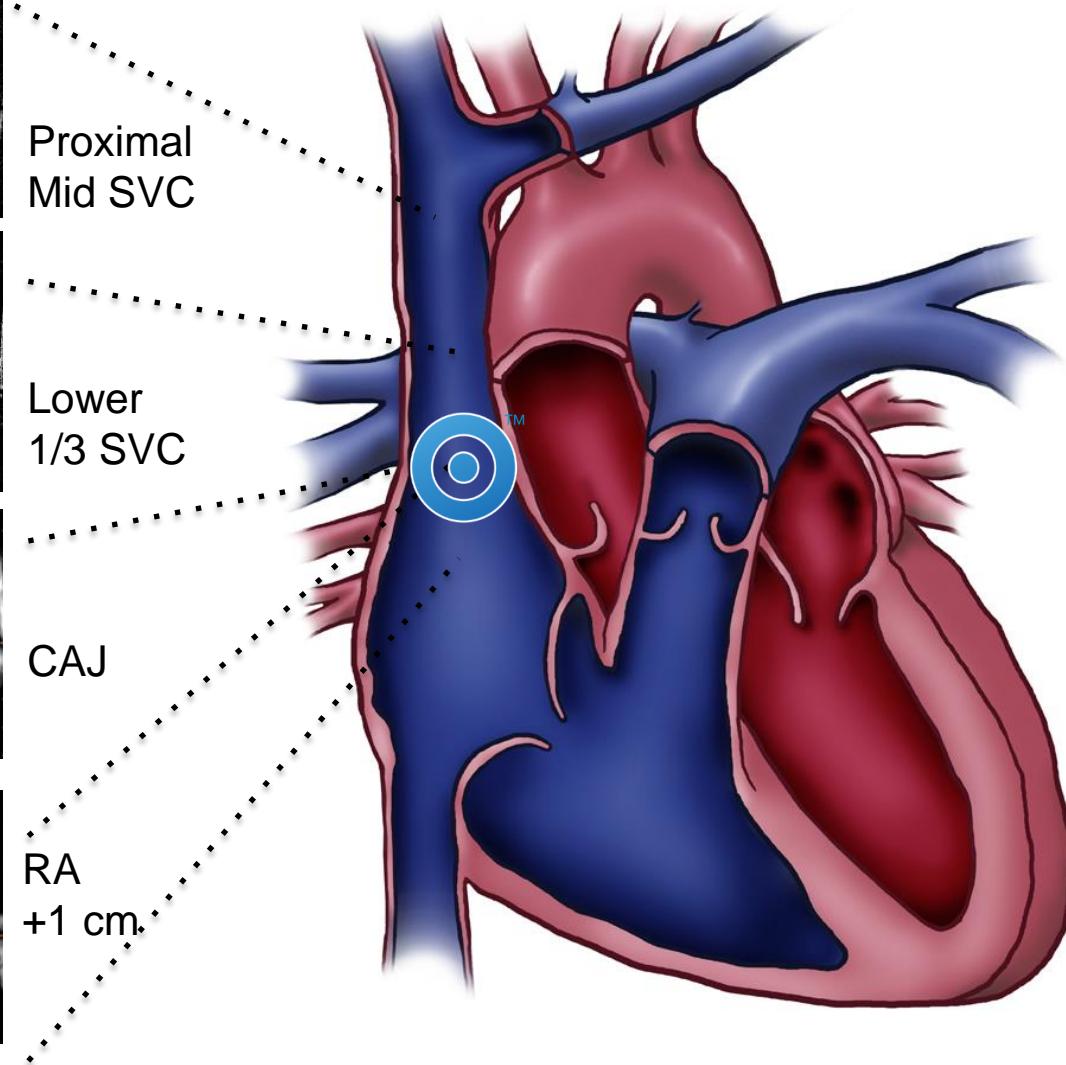


Proximal  
Mid SVC

Lower  
1/3 SVC

CAJ

RA  
+1 cm



# Proprietary Algorithm



Advanced Software Algorithm displays in symbols on the console screen

- **GREEN ARROW:** Keep going
- **ORANGE CIRCLE:** Wrong way, retract catheter and slowly advance
- **YELLOW TRIANGLE:** Damped Doppler signal, adjust/flush catheter
- **BLUE BULLSEYE:** You've arrived at the lower 1/3 SVC-CAJ

## Putting it All Together

---

### Look

- Where is the PICC in relationship to the sound?
- How much catheter is outside the insertion site?

### Listen

- What is the sound of the Doppler?
- Listen for the changes
- Hear the change as the Doppler drops into SVC

### Feel

- What is the clinician feeling as he/she is navigating the vessel?

## Tip Positioning with the ARROW® VPS G4™ Device

- Accuracy greater than 98% when targeting precisely the lower 1/3 of the SVC-CAJ\*
- Can be used for navigation in patients with abnormal P-wave
- Provides direction in cases where CXR image would not be clear
- Confirmation provided via clear symbol, in addition to waveforms
- Confirms the tip to be distant from the SVC and RA walls
- Prevents wall erosion, thrombosis and catheter occlusion

Data on file\*

## Navigating with the ARROW® VPS G4™ Device

---

- Prevents arterial placement
- Shows wrong direction immediately – reduces back and forth movement – minimizes potential vein damage and spasms
- Prevents Azygos placement
- Can be used on all adult patients, including obese and those in upright position
- No magnetic interference
- Can distinguish temporary spasm from stenosis
- Can identify vein confluence for easier passage through IJ area
- Provides looping detection