ARROW® VPS G4™ Device Quick Start

Non-Sterile Setup

VPS G4 Base Unit and VPS G4 Interface Setup

1. Connect the VPS G4 Base Unit to the VPS G4 Interface via the USB cable and plug the Base Unit into AC power.
2. Press and Hold the VPS Base Unit power button for approximately 1 second.
3. Press and Hold the VPS G4 Interface ON/OFF button until the Apple® icon appears and the Apps appear. Swipe the screen until you see the VPS App.
4. Touch the VPS® App. Touch "NEW PATIENT", enter patient information and touch the Return button. **Patient ID is mandatory.** (**NOTE**: No spaces or special characters are allowed.)
5. Touch CONTINUE button. (**NOTE**: Patient ID can be found on the left side of the LIVE screen).
6. Attach ARROW® VPS® Stylet Extension Cable to the front of the VPS G4 Base Unit, aligning the red dots on the connectors.

ECG Setup

1. Connect electrodes to ECG leads. Place electrodes on patient body. **WHITE** on right shoulder, **RED** and **BLACK** on left leg.
2. Connect ECG cable to the VPS G4 Base Unit, if it is not already connected.

ECG Calibration

1. At the LIVE window, touch the CALIBRATE button. Calibration stops automatically and the START button will be enabled. This step may take 1-2 minutes.
2. If calibration is not achieved, the START button becomes **orange**. The clinician can still continue with the procedure, using the Doppler and ECG graphical information, but the colored navigation symbols will not appear. Therefore, an alternative method of tip confirmation is required.

Sterile Setup

Set up the sterile field per your hospital policy.

Loading Stylet

1. Load the ARROW VPS Stylet into chosen PICC. Check that 1 mm of the Stylet is protruding from the catheter tip when the catheter is extended, and firmly tighten the Touhy Borst.

Setting Up Remote Control

1. Place your hand inside the sterile bag, grasp the Remote Control and pull the bag over the device and seal. Use the Remote Control to operate the VPS G4 Interface from the sterile field.
2. Using the Remote Control, press UNMUTE and then press the START button.

Stylet/Doppler Testing

1. Flush VPS Stylet lumen with saline.
2. Listen for a strong "whoosh" sound as fluid passes over the VPS Stylet. If no sound is heard see "Troubleshooting" section in "VPS G4 Bedside Quick Guide" or "VPS G4 Device Console Operator's Manual" for further instructions.
3. Press STOP button. Clamp flushing port to maintain saline column.

Procedure

1. Insert catheter/ARROW® VPS® Stylet assembly into introducer.
2. Press START button. Wait for 7 seconds, until a colored symbol is displayed, before advancing the catheter/VPS Stylet assembly.
3. **SLOWLY** advance catheter 1-2 cm per second.
4. When a Blue Bullseye is achieved, maintain the catheter/VPS Stylet assembly position until the REPORT button turns **blue**.
5. Press the POWER/REPORT button on the Remote Control, or touch the REPORT button on the VPS G4 Interface, to save a copy of the screenshot as a PDF File available for download or printing at your convenience. If a steady Blue Bullseye is achieved, the REPORT button automatically turns **blue**, and the PDF will then include the statement: **"Tip Placed At Lower 1/3 of The SVC Or At CAJ".**
6. Press STOP Button.

The VPS G4™ Interface will display the following symbols:

GREEN Arrow – Keep advancing. The catheter is moving with the flow of blood towards the heart.

ORANGE Circle – Stop. The catheter is moving against the flow of blood. Pull back until **Green Arrow** or **Blue Bullseye** symbol is obtained. Redirect.

YELLOW Triangle – Stop. The catheter is possibly against a vessel wall or retracted inside the catheter. Pull the catheter back and redirect. Check the VPS Stylet marking to verify the tip has not retracted back inside the catheter.

BLUE Bullseye – Stop. You have reached the lower ⅓ SVC-CAJ. The Report button turns **blue** automatically when a steady **Blue Bullseye** has been achieved.

Post-Procedure

1. Return to the HOME screen and touch the SHUT DOWN button. This will turn off the VPS G4 Base Unit.
2. Place the Remote Control in a location where the device will not be inadvertently thrown away, *e.g.* keep it with your Sharps items.
3. In the event a Remote Control is thrown away inadvertently, or lost, the hospital will be responsible for replacing it. Replacement Remote Control Cost: $246.45 each.
4. Press the HOME button to return to the home screen to begin or review a case.

Anatomical Location	ECG Waveform Description	Doppler Description
Upper Vasculature	Regular ECG or distorted waveform due to Stylet movement.	Doppler waveform small (lower amplitude, less steep).
Confluence of Two Veins	No specific changes.	May see transient turbulence, below baseline (audible and visible). May see intermittent Orange Symbol, e.g. Internal Jugular vein.
Proximal/ Mid SVC	Regular ECG. P-wave might grow slightly. R-wave often grows.	Pulse waves taller and steeper with two antegrade peaks and (Systolic/Diastolic) and distinct small retrograde wave.
Distal SVC-CAJ	P-wave grows visibly. All other ECG waves can increase.	Several types of blood flow signatures, with increased turbulent activity around the baseline. Most common pulsatile, “cathedral” type waveform.
CAJ	May not see significant change of P-wave as catheter tip moves from lower 1/3 SVC to CAJ. (See row above.)	Increasing retrograde Doppler signature. RA turbulent elements. Waveforms are distinct in upper CAJ.
RA	P-wave inconsistent could be maximal, or even decreasing, or Bi-phasic. Higher amplitude in other parts of ECG.	Intense turbulence, usually retrograde dominant or combination. Loss of pulsatile sound, similar to sound of white noise.

Typical Examples of VPS Signature Descriptions