

# Ultrasound Guided Peripheral Vascular Access

## Basics

### *Clinical Indication*

- Use when traditional IV attempts fail
- Use as first line for difficult access patients
- Predictors of difficult access: obese, edema, IV drug use, dialysis, or frequent IVs

### *Vascular Ultrasound*

- Arteries: thick walled, non-compressible
- Veins: thin walled, compressible
- Needle will appear as a small bright dot with dark shadowing or bright repeating artifact
- North star sign: visualization of needle tip in near field just as tip crosses plane of the probe in short axis (like a star in the sky)

## Anatomy

### *Veins of the Arm*

- Cephalic vein - runs laterally (most superficial, no associated nerve or arteries)
- Basilic vein – runs medially (larger size)
- Brachial vein – runs deepest (adjacent to brachial artery and nerve)

## Peripheral IVs

- Use longer IV catheter (1.8-2.5 inch)
- Best success with large veins that are > 1.5 cm surface

### *Getting Started*

- Scan area of interest 1<sup>st</sup> to find vessel target
- Clean probe with antiseptic wipe and apply sterile lubricant
- Hold probe in non-dominant hand
- Adjust gain so vessel lumen is black

### *Confirming Placement*

- Confirm needle tip is in vessel before casting off catheter
- Visualization of tiny bubble during saline flush can also confirm placement
- Anechoic fluid in surrounding tissue means catheter is not in vessel or it has infiltrated

## Transverse Approach (Short Axis)

- Vein is visualized in short axis & appears as a circle
- Best approach to avoid neighboring structures
- Probe marker is oriented to same side as indicator on screen
- Center target vessel on screen
- Insert needle at 45 degree angle in line with the center of the probe (needle should be directly over vessel)
- Follow needle tip as it advances proximally by fanning or sliding probe
- "Leapfrog" method: advance probe incrementally ahead of needle tip, then advance needle tip until visible, and repeat
- If you lose your tip, improve needle visibility by bouncing in and out slightly
- Confirm placement by visualizing catheter in longitudinal view (just rotate probe 90 degrees)

## Longitudinal Approach (Long Axis)

- Better visualization of needle than transverse approach
- Vein is visualized long axis & appears as a long tube
- Probe marker is directed towards patient's hand (distally)
- Insert needle at 30 degree angle
- Must keep probe and needle in line (1 mm ultrasound beam)
- If you lose the needle tip, fan left and right to find it. Redirect if small correction.
- Confirm placement with visualization of catheter in vessel on longitudinal view