

VASCULAR ACCESS

ARTERIAL ACCESS

Best Practices

For the best and optimal
radial arterial cannulation



Radial arterial catheters are widely utilized in critical care for continuous hemodynamic monitoring, enabling timely adjustments to vasopressor therapy and facilitating blood sampling.

However, **catheter failure remains a significant challenge**, with reported incidence rates approaching 25%¹.



REPEATED INSERTION FAILURE?

WASTE OF TIME?

ARTERIAL OCCLUSION?

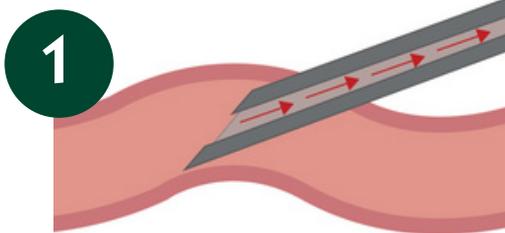
ARTERIAL SIGNAL LOST?



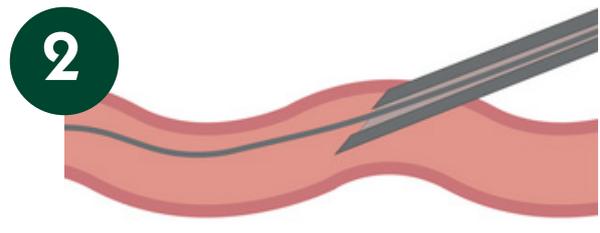
What about the **Seldinger technique**?

The Seldinger technique is a **less traumatic technique** which helps to increase the chances of cannulation at 1st attempt.

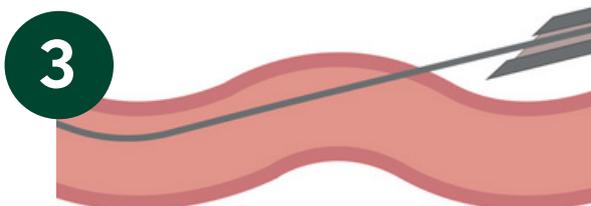
► The use of the direct-puncture technique was associated with a significant higher failure rate (23%) than the use of a catheter with a classic Seldinger technique².



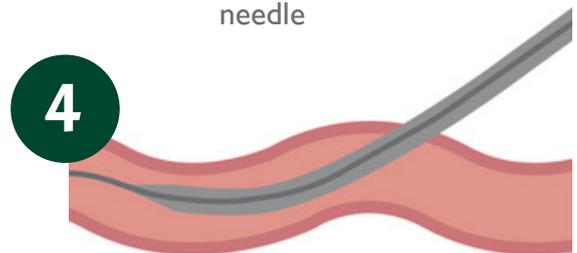
1
Insertion of the needle in the radial artery



2
Insertion of the flexible guidewire into the artery through the needle



3
Removal of the needle, leaving the guidewire in place



4
Insertion of the catheter over the guidewire and then removal of the guidewire



Do you know the **RADIALS** acronym?³

Radials



The catheter should take less than 45% of the artery lumen.

Allen's Test & Assessment



Assess the region & evaluate for collateral circulation.

Distance from the wrist



To **reduce mechanical failure or instability caused by flexion** or movement, the insertion site should be **>4cm proximal from wrist crease**.

Integrity of the skin



Inspecte wrist & forearm for any redness, bleeding, hematoma or localized swelling.

Angle of insertion



To **reduce the risk of catheter kinking and so a device failure, insert with ultrasound <30°**. Avoid >45°.

Lenght of the catheter



Consider total catheter length, relative to artery depth & angle insertion. **65% of the catheter's length should be inside the artery**.

Securement



The standards of practice recommend to use a securement method, such as adhesive securement device, integrated securement device, subcutaneous anchor securement system or tissue adhesive, in addition to the primary dressing to stabilize and secure the catheter.

Avoid the use of sutures as they are not an effective alternative to a securement method. Indeed sutures are associated with needlestick injury and increase the risk of catheter infection⁴.



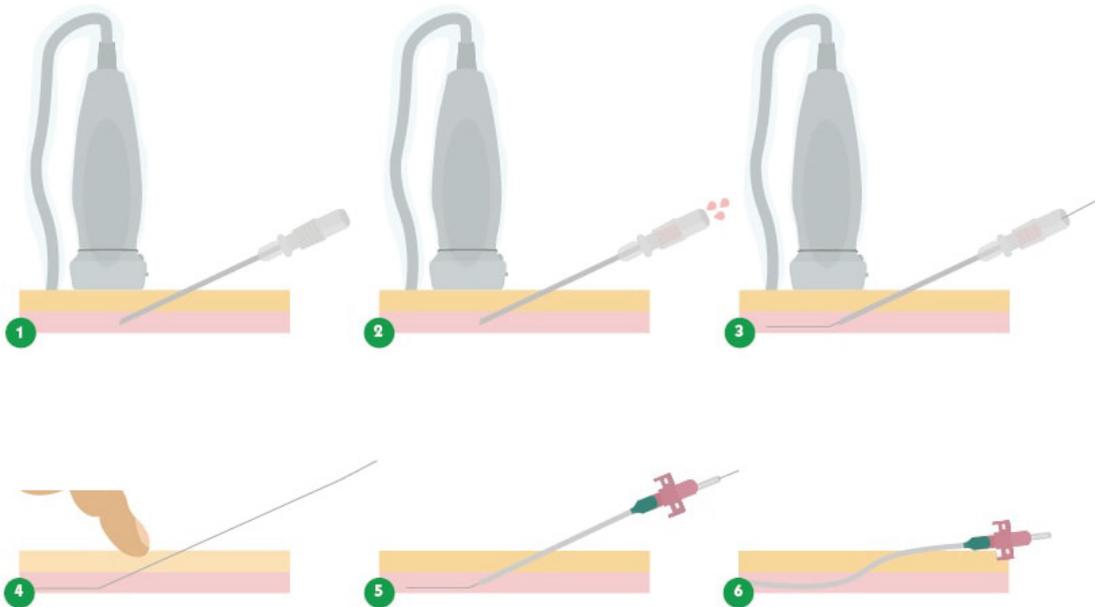
Adhesive fixation devices are a great alternative to suturing, with a complication rate of 21.3% compared to 47.2% associated with suturing.



Ultrasound guidance: the BEST practices!

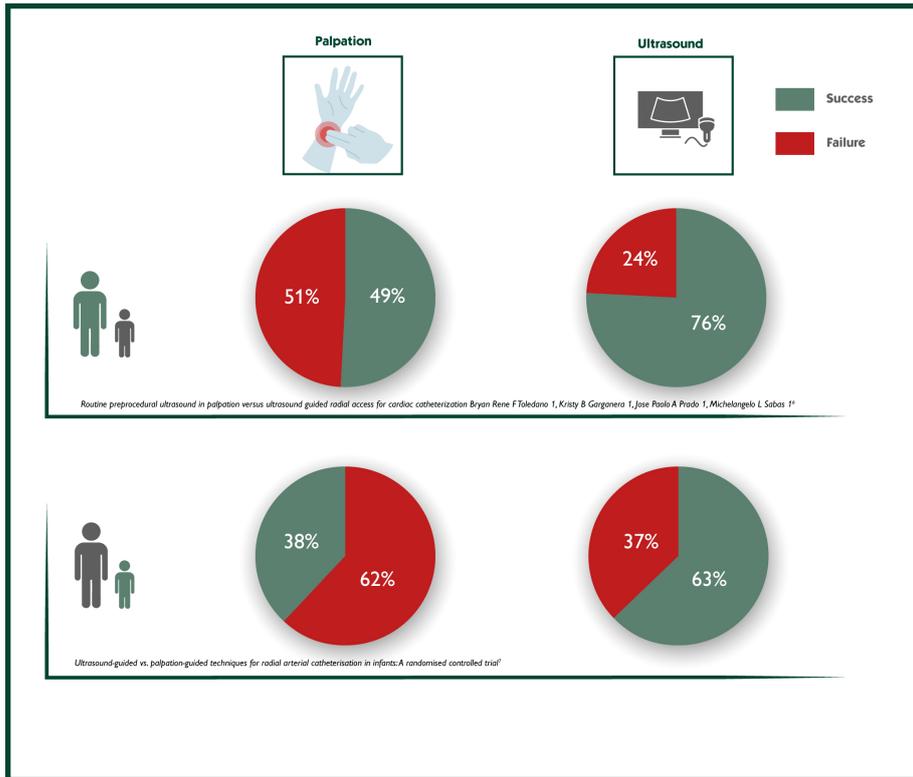
Ultrasound-guided arterial cannulation has now become the standard of care.

Using ultrasound guidance during the catheterization of the radial artery has been associated with a high success rate, fewer mean attempts, shorter procedure time, less hematoma formation, distal embolization, pseudoaneurysm, and arteriovenous formation⁵.

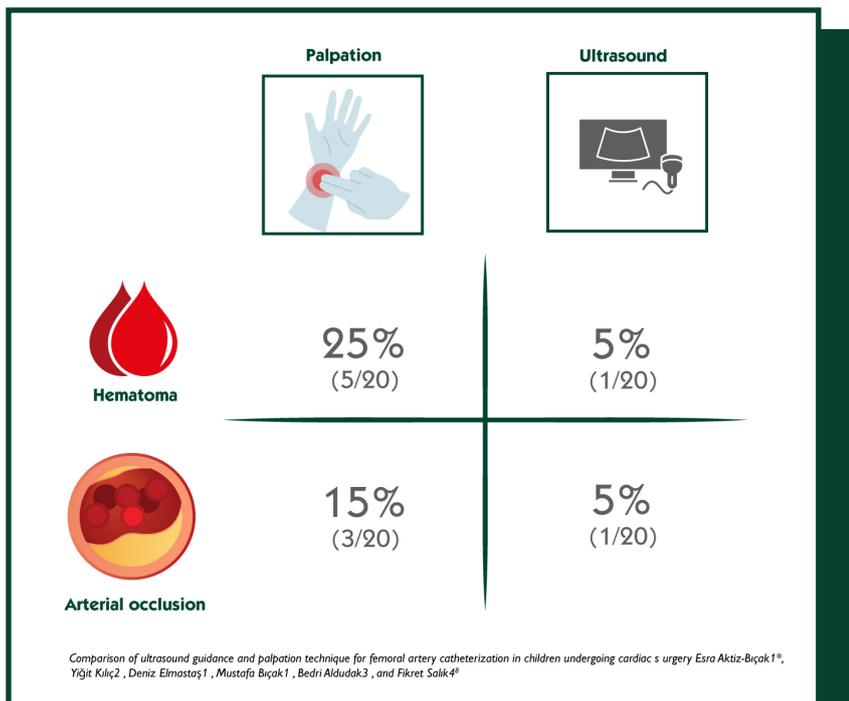


Discover our Campus Vygon article:
[*Ultrasound-guided arterial cannulation in 6 steps.*](#)





US guidance for arterial cannulation was successful more frequently and it took less time to establish the arterial line as compared with the palpation method.⁸





Minimize Infection, Maximize Accuracy: The Arterial Line Maintenance

Hygiene and Asepsis



- Perform thorough hand hygiene before any manipulation
- Wear sterile gloves, mask, and gown as needed
- Disinfect insertion site with alcohol-based antiseptic or chlorhexidine

Daily Monitoring



- Check for redness, swelling, warmth, and pain
- Observe for bleeding or oozing
- Ensure pressure bag >300 mmHg
- Monitor arterial pressure waveform for proper oscillation
- Perform zeroing every 12 hours

System Maintenance



- Flush regularly with heparinized saline (NaCl 0.9% + heparin 10,000 IU/L)
- Never flush using a syringe (risk of embolism)
- Replace tubing every 4 days or per local protocol

Dressing Changes



- Change every 48–72 hours or sooner if soiled
- Use circular antiseptic technique with 3 sterile swabs
- Allow antiseptic to air dry before applying new sterile dressing

Blood Sampling



- Disinfect stopcock with antiseptic swab
- Gently aspirate blood using sterile syringe
- Flush catheter immediately after sampling

Catheter Removal



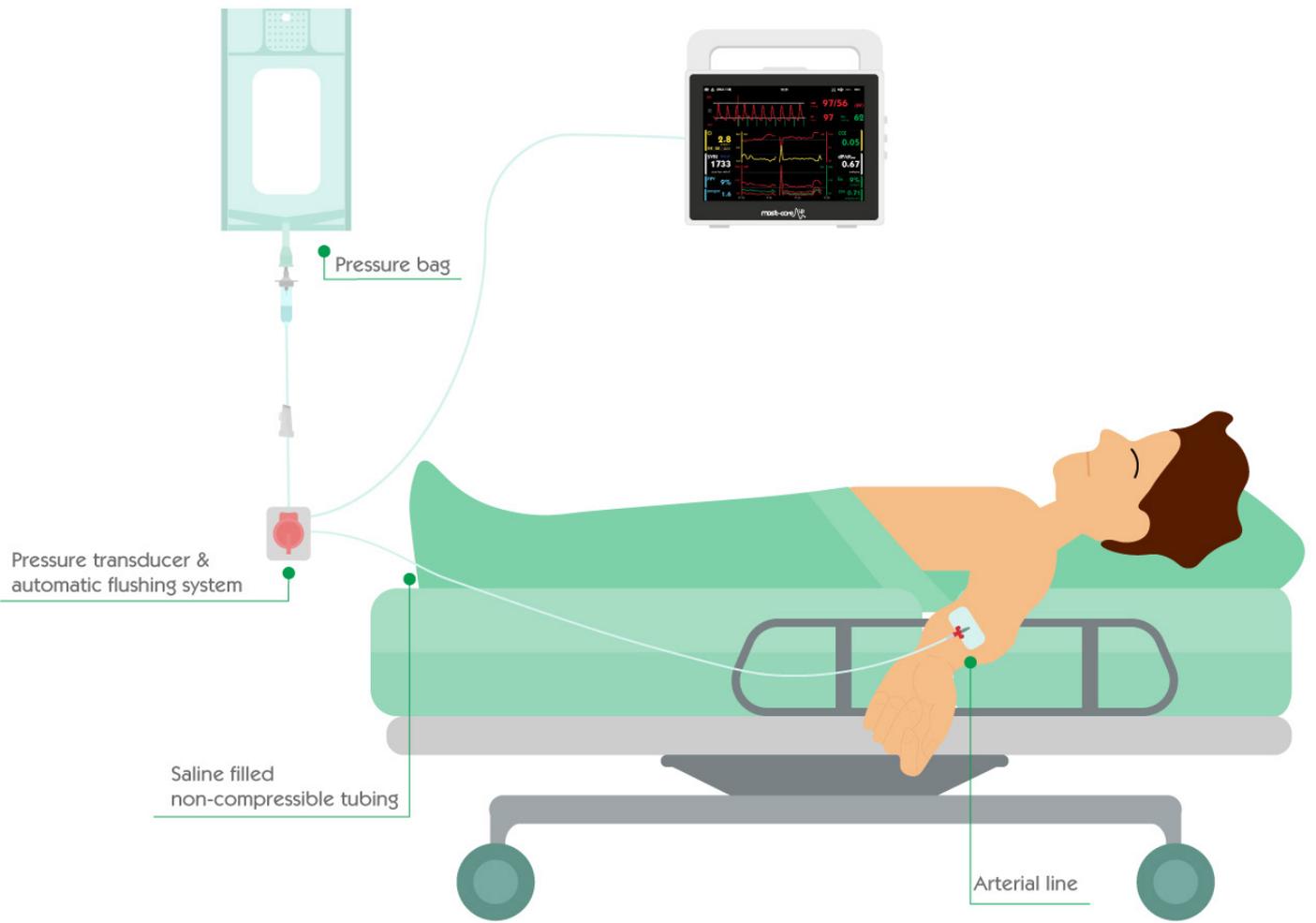
- Only on medical prescription
- Stop anticoagulation 1 hour prior if needed
- Apply manual compression for 5–10 minutes
- Use compressive dressing post-removal
- Send catheter for culture if infection is suspected

Safety Reminder



Zero calibration and skin monitoring are essential for safe and accurate arterial catheter maintenance.

The optimal set-up



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8. Comparison of ultrasound guidance and palpation technique for femoral artery catheterization in children undergoing cardiac surgery
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