

PR37: Femoral Arterial Line Placement

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Applicable To

■ CCP only

Introduction

Direct continuous measurement with an intra-arterial catheter is the gold standard for determining arterial blood pressure and blood sampling. This allows for aiding and guiding ongoing care in real time. The most common site for insertion is the radial artery as it is easiest to access and landmark. Due to patient habitus or anatomy, a femoral approach may be necessary as an alternative.

Indications

- Identification and monitoring of acid-base disturbances
- Measurement of the partial pressures of oxygen and carbon dioxide
- Assessment of the response to therapeutic interventions
- Hemoglobin quantification and response to intervention

Contraindications

Relative:

- Local infection, thrombus, or distorted anatomy at the puncture site
- Severe peripheral vascular disease
- Supratherapeutic coagulopathy and infusion of thrombolytic agents
- INR ≥ 3
- PTT ≥ 100
- Platelet count $< 50 \times 10^9/L$

Caution: Arterial line placement should be done for ongoing guidance of care and not a singular point of care test.

Procedure

1. Prime femoral arterial line set (with or without VAMP).
2. Normal saline run through arterial line set.
3. Remove white vented caps and replace with blue non-vented caps.
4. Apply pressure infuser at 300 mmHg.
5. Connect to monitoring cable.
6. Identify femoral artery either by palpation or with ultrasound (preferable).
7. Locate the inguinal ligament. Never allow the needle to cross the inguinal ligament.
8. If applicable, move the pannus.
9. Clean insertion site using aseptic sterile technique.
10. Full barrier precautions including mask, cap, and eye protection should be worn.
11. Position wrist/hand to allow for access to femoral artery.
12. Landmark femoral artery for catheter insertion.
13. A skin nick should be made with a scalpel to avoid a skin plug or damage to the catheter.
14. Using femoral artery line catheter, insert at 45° angle until blood return.

15. Use included slide and guidewire to perform Seldinger technique to assist in catheter insertion. (If using a separate wire, utmost care should always be used for strict wire control.)
16. Slide catheter off hub while retracting needle (this will be an exposed sharp).
17. Secure line with suturing.
18. Apply Opsite.
19. Attach primed femoral artery line tubing.
20. Level the transducer.
21. Zero art line.
22. Turn off to patient.
23. Open line to air.
24. Zero on monitor.
25. Perform square waveform test.

Notes

- Consider the risk stratification for an invasive procedure including the time associated with insertion and the need for conveyance.
- Consider the use of venous blood samples when appropriate.
- Arterial samples are often not required if oxygenation is known to be appropriate and SpO2 levels are adequate and reliable.
- Venous blood gas samples can be adapted to determine acid-base status with the appropriate conversions (excluding a reliable PaO2).
- Hemodynamic monitoring may be accomplished with a faster, albeit less reliable, procedure (NIBP). A risk assessment should be done to determine the need.
- The femoral site is at a greater risk of infection. Diligent cleaning and sterile technique needs to be done prior to insertion.

References

1. Theodore AC, Clermont G. (2020). Intra-arterial catheterization for invasive monitoring: Indications, insertion techniques, and interpretation. [[Link](#)]
2. Theodore, AC. (2021). Venous blood gases and other alternative to arterial blood gases. [[Link](#)]
3. Theodore AC. (2020). Arterial blood gases. [[Link](#)]

